Evaluation of gender-based differences in primary school maths education: the potential of digital games

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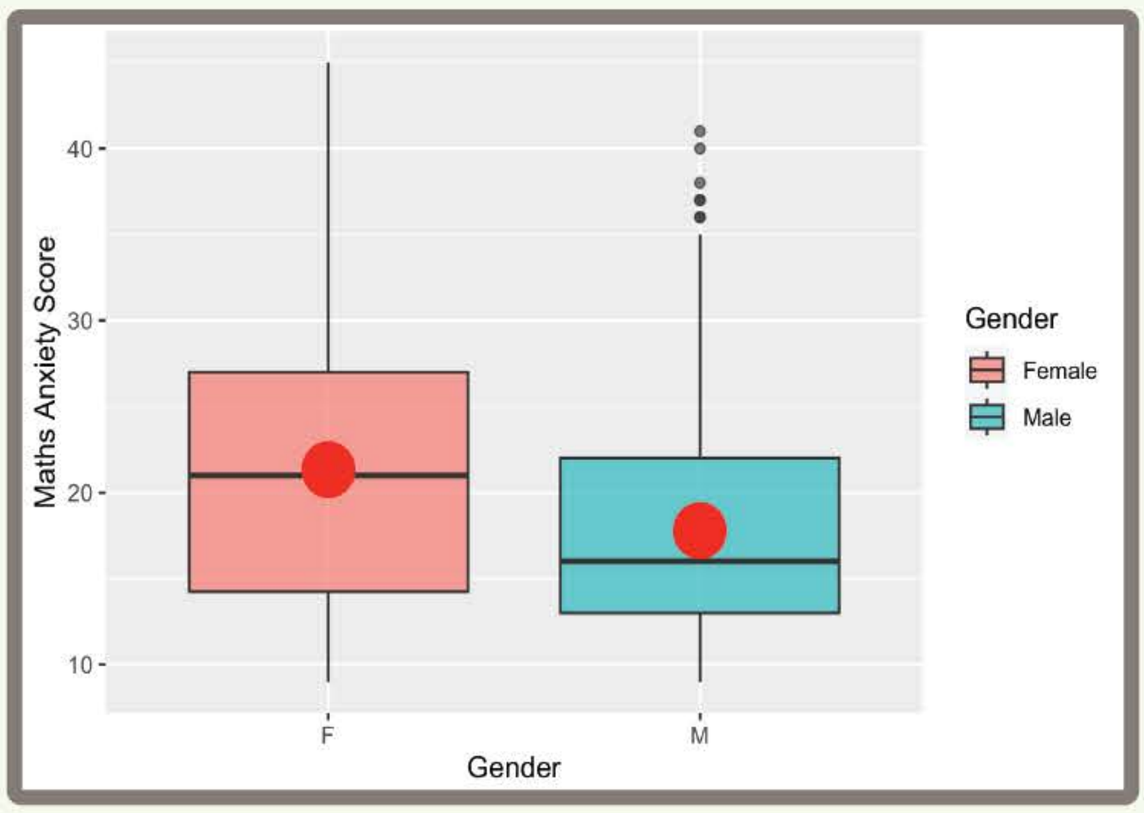
Background

Digital Game-Based Learning is shown to be a more effective instructional method than traditional instruction, however less effective than other technology-supported instruction according to Byun and Joung (2018). Regarding gender aspects, according to findings by Mclaren and colleagues in 2022, girls may learn more mathematics from digital learning games than boys. In their study, even reporting greater behavioural and cognitive engagement, boys did not learn more with the game than girls.

Table 1: Number of students according to the gender

Gender	Number of students
Male	441
Female	382



In a preliminary study, a Wilcoxon Signed-Ranks Test indicated that MA mean score in the female students (21.3) was significantly higher than the male group (17.8), with a small effect size ($p < 0.0001$, effect size $r = 0.22$).

What are the gender-based differences in the effectiveness of a maths digital game intervention on maths anxiety levels and learning outcomes in Irish primary schools? Can the students' game's strategy be useful to explain these differences?

Methods

- **A randomised controlled trial (RCT): experimental group (DGBL) and control group (conventional maths instruction);**
- **Quantitative analysis (based on the outcome measures' expected effect size, significance level, and variance)**
- **Qualitative analysis of focus groups (NVIVO software)**

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