

All Aboard! Towards Inclusiveness in Digital Game-Based Teaching

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EXTENDED ABSTRACT

Digital games and gamification tools have the potential to address a variety of pedagogical objectives across a range of subject areas in education (Hainey et al. 2016). They can be valuable learning environments, increase student motivation and engagement, improve cognitive learning outcomes about processes, causes and effects, programming and the development of collaborative skills (Connolly et al. 2012; Boyle et al. 2016; Kafai & Burke 2016; Huizenga et al. 2017). In practice, however, teachers may have varying gaming backgrounds, game-related pedagogical competencies and access to relevant resources (Mathe et al. 2019a, 2019b). This paper discusses the challenges of teachers regarding the implementation of digital games in education as identified in two studies conducted by the authors (Mathe et al. 2019a, 2019b). The studies employ a broad interpretation on what constitutes a game and include any form of digital games played on any kind of digital device. Gamification merits a place in the studies as teachers may understand the use of gamification tools as digital game-based teaching.

Data were collected through an online survey in Sweden during spring 2019 and consisted of single and multiple-choice questions (24 items), scaled (12 items) and an open-ended question (1 item). Questions with pre-defined answers included the possibility to supply open answers. The survey was distributed via teacher social media forums and sent to 1200 schools across Sweden randomly selected from the central database of the National Agency for Education. Altogether, 181 compulsory and upper secondary school teachers responded to the survey. The majority of respondents were females (65%, N=118), and the largest age group was 40-49 (30%, N=55), characteristic to the teacher population as well. Analytical methods included descriptive statistical analysis using frequency distribution and k-means cluster analysis (Mathe et al. 2019a, 2019b).

The findings from the studies indicate that digital games and gamification tools may have found some foothold in Swedish classrooms however game-using teachers may be different in the way they understand and implement digital games. Altogether 68 % of the respondents reported that they have used digital games and/or gamification tools in their teaching at some point of time (Mathe et al. 2019a). Most frequently reported teaching resources are gamification tools, typically quizzes. Other resources listed include gamified digital textbooks, serious games, game creation tools, 2D simulations, entertainment games, virtual reality simulations, augmented reality games, e-sport and teacher created games. Male teachers in the sample report more experience of playing games for entertainment purpose and have been five times more likely to report the use of *entertainment* games in their teaching than their female peers. On the other hand,

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female teachers have been more likely to report the use of *educational* games and gamification tools (Mathe et al. 2019a). Cluster analysis conducted on the subset of game-using teachers has identified negative, mixed and positive disposition towards digital game-based teaching. A more positive disposition generally relates to greater variety of game use, increased pedagogical integration, higher and more varied perceived educational outcomes, and interest in professional development (Mathe et al. 2019b). However, one third of teachers in the sample have yet refrained from using digital games in classrooms. While non-game using teachers have generally expressed interest to incorporate games in their teaching, they are typically unfamiliar with game-related technologies and unsure about their pedagogical implementation. Most important challenges for teachers in general include difficulty to access good quality games with curricular relevance, lack of preparation time and costs (Mathe et al. 2019a).

In summary, the results suggest that gamification and digital game-based teaching may have some foothold in Swedish classrooms, while their implementation is uneven. Despite that teachers in the studies are generally interested in implementing game-based teaching, there are gaps among them in their use of game resources and the extent they can leverage these for educational outcomes. Findings also indicate that gender and previous gameplay experience may have an influence on the types of games selected. Furthermore, the threshold for teachers at entry-levels of digital game-based teaching may be yet too high, thus a large part of teachers, and consequently their students, might be currently left out of the possible benefits that digital games and gamification tools may bring to classrooms. These findings raise the question of how game developers and educational stakeholders can identify ways to lower the threshold for teachers at entry levels of digital games-based teaching and support professional development around games. Researchers, game-developers and educational stakeholders should therefore investigate how teachers and learners could benefit from digital games and gamification more inclusively in the future.

Keywords

digital game-based teaching, digital games in education, game-based learning, inclusiveness

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