

Chapter 6

Gamification and Augmented Reality to Upgrade Elementary Bilingual Education Students' Health and Engagement: An Innovation and Research Proposal for Teacher Education

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ABSTRACT

Sedentary life-style, obesity, and early school leaving have been identified as major causes leading to the biggest health and educational problems in developed countries. This may derive into students showing a not recommended passive role at these ages, which also leads to their lack of interest and motivation in learning and education. This chapter presents an innovation research project which aims to face sedentariness in elementary school by applying an instructional technology-based model with the use of gamification and augmented reality in a bilingual education context. The case study shows several educational advantages, including increase in physical exercise, health awareness, learning engagement, and upgrade in L2 content understanding and linguistic skills.

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INTRODUCTION

Early school leaving, sedentariness and obesity are documented critical health, social and educational problems in some western countries. Research demonstrates the adverse effects in children's population of modern society's sedentary lifestyle. The picture shows that sedentary habits and routines at home and during children's free time, scarce physical exercise, and sports and an extreme caloric diet and poor nutrition awareness, result in children's obesity, among other diseases. Pedagogical approaches which demand children to acquire a passive role in the classroom remaining unnaturally at their desk for hours every school day do not help improve those habits either. This may lead to students showing a not recommended passive role at these ages, also deriving in lack of interest and motivation in education. Hence, another piece in this puzzle refers to early school leaving due to, among other causes, lack of engagement towards learning, especially in some bilingual education programs. Learning content matter through L2 may represent a cognitive, emotional, and social challenge for some children and their families. This chapter reports on the design, implementation, and results of a case study within an innovative research project which aims to face sedentariness in elementary bilingual education school by applying an instructional technology-based model with the use of gamification and Augmented Reality. More specifically, this research project's overall goals are: (i) Design an innovation project based on a gamified methodology through Augmented Reality; and (ii) Implement the Project in a real bilingual education school context to examine the instructional model effectiveness. To achieve these general aims, the following specific objectives were defined:

1. Design an innovative instructional model and create an IT educational resource based on gamification and AR to enhance motivation and engagement to enhance academic L2 performance in elementary bilingual education students.
2. Implement this resource and analyze its impact in the CLIL (*content and language integrated learning*) classroom.
3. Delineate future research based on the project case-study findings and its implication in teacher education programs.

Two main research questions formulated to serve as a guideline for this research:

- RQ1. What is the effect of using History Go on students' L2 and history content matter learning engagement and understanding?
- RQ2. What is the effect in their physical activity and health awareness?

By merging the use of IT and gamification approach, this innovative research project developed a digital game with *Aurasma*, (now *HP Reveal*), an Augmented Reality Application. The instructional model designed and implemented in a bilingual education context targeted a three-level development: cognitive, emotional, and social. This gamified methodology with the elementary school students who participated in the small-scale case-study served to assess and check the proposal effectiveness in a real context in *Virgen de Navalazarza* state bilingual school in San Agustín de Guadalix, a village located in the northern area of Madrid region.

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