

## Chapter 4

# Rapid Game Development Using LiveCode in SEN and DHH Education

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### ABSTRACT

*For over 30 years, literacy has been recognized as a key concern in Special Education Needs (SEN) and especially in Deaf and Hard of Hearing (DHH) education. No different in Mauritius, these children struggle to get passing marks in French language at elementary level. Addressing this concern, literature has been reviewed in the context of games for SEN and DHH education. Taking advantage of the potential of gamification, simple letter games have been developed using LiveCode. The games were administered to a sample of 14 SEN and DHH elementary students using the underlying action research theoretical framework. To assess the effectiveness of the games, the students' level of motivation after using the games was measured using the Instructional Materials Motivation Survey (IMMS) based on Keller's (2010) ARCS motivation model. The results demonstrated the potential of using LiveCode to develop timely serious games to support SEN and DHH students' literacy skills.*

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## **INTRODUCTION**

For over 30 years, literacy has been recognized as a key concern in Special Education Needs (SEN) and especially in Deaf and Hard of Hearing (DHH) education. No different in Mauritius, around 25% of children with disability are categorized as severe to profound, and these children struggle to get passing marks in French language at elementary level. The latter subject being a prerequisite to passing the Primary School Achievement Certificate (PSAC) assessment classified as the first level on the National Qualification Framework. Addressing this concern, literature has been reviewed in the context of games for SEN and specially DHH education. Serious games have proved to benefit children with special needs, increasing their motivation level and supporting their literacy skills at the same time. Taking advantage of the potential of gamification in SEN and DHH education, simple letter games have been developed using LiveCode, a cross-platform development tool. This authoring tool allowed for the rapid design and development of the games' prototype for evaluation and testing purposes before the final deployment of the software. The games were administered to a sample of 14 SEN and DHH elementary students using the underlying action research theoretical framework. While the rapid game development stages meet those of the outlining phases of action research, the latter framework served as basis for the methodologies and evaluation protocols employed in this project. To assess the effectiveness of the games, the students' level of motivation after using the games was measured using the Instructional Materials Motivation Survey (IMMS) based on Keller's (2010) ARCS motivation model.

The following sections give an overview of literature, a brief description of the methodology employed and describe each stage of the game development; from gathering users' requirements to prototyping, testing and deployment of the games.

## **BACKGROUND**

Special Educational Needs (SEN) refer to learners with learning, developmental, and physical disabilities; communication, emotional, and behavioral disorders; and learning deficiencies (Bryant et al., 2019). In Mauritius, around 25% of children with disability are categorized as severe to profound, and those children normally attend SEN schools because they need resource assistance or require direct attention from Special Needs teachers (Ministry of Education Tertiary Education Science and Technology, 2017). A sub-category of SEN includes Deaf and Hard of Hearing (DHH) children. The delayed exposure to a first language in DHH children affects language acquisition and the development of a second one (Humphries et al., 2014; Mayberry, 2007).

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