UNDERSTANDING THE USE OF MOBILE RESOURCES TO ENHANCE PARALYMPIC BOCCIA TEACHING AND LEARNING FOR STUDENTS WITH CEREBRAL PALSY

Fabiana Zioti, Giordano Clemente, Raphael de Paiva Gonçalves, Matheus Souza,
Aracele Fassbinder and Ieda Mayumi Kawashita
Federal Institute of Education, Science and Technology of South of Minas Gerais
IFSULDEMINAS – Campus Muzambinho

ABSTRACT

This paper aims to discuss about how mobile technologies and resources can be used to support teaching and improving the performance of students with cerebral palsy during out-door classes in the paralympic boccia court. The Educational Design Research has been used to help us to identify the context and to build two interventions: i) using an online boccia game and ii) developing a digital booklet to support teaching and learning paralympic boccia.

KEYWORDS

Teaching; Disability Sports; Adapted or Paralympic boccia; Cerebral Palsy; Assistive Technology; M-Learning.

1. INTRODUCTION

According to the last results from the Brazilian Population Census performed in 2010, the total Brazilian population was about 200 million inhabitants and nearly 46 million people have some form of disability.

Considering this question, many teachers of the Federal Institute of Education, Science and Technology of South of Minas Gerais at Muzambinho city, in the countryside of Brazil, have been developing academic projects to promote learning and inclusion in the local community.

One project aims to promote sports initiation and enhancing the full potential of students with disabilities through paralympic boccia activities in a local and formal school for adults and children with special needs. The paralympic boccia is similar to the conventional boccia, it means the player aims to touch balls in the target ball (Figure 1). This modality is able to cover different age groups, and can be developed in a playful manner. High-yield activities can also be achieved, like professional contests, which expands the possibilities within the game (Oliveira and Kawashita, 2015).

Another project aims to use information technology to stimulate the student´s cognitive development and it is also based on the same place.

Since 2014 we have been developing activities in order to promote an interdisciplinary project combining specialists from the physical education and computer science areas and to understand how digital technologies can be used to improve the performance of students with disabilities during out-door classes in the paralympic boccia court.

Firstly, a preliminar experiment was conducted in order to investigate the influence of online boccia games on the performance of real paralympic boccia activities perfomed by the students (Aquino Jr, Fassbinder and Kawashita, 2014). In short, students with multiple disabilities (physical and intellectual, in this case) were trained using online boccia game in the computer lab (Figure 2). The computer teacher encouraged different game strategies, spatial location and opponent analysis. Next, the first evaluation was conducted on the court, and it was based on carrying out shooting practice, considering the variables of precision play and playing intentions.

Figure 1. A paralympic boccia class.

Figure 2. Bows: online boccia game

Considering the initial positive insights from the previous step, we developed an educational digital booklet which contains all the main related theory about the paralympic boccia. The educational resource was installed on an educational tablet and used during outdoor activities to enhance paralympic boccia teaching for beginners with cerebral palsy. The purpose of this paper is to describe the main conducted activities and the initial results about this step.

2. BRINGING M-LEARNING IN THE ADAPTED BOCCIA CLASSROOM

The Educational Design Research (EDR) has been the principal methodology used to achieve our intended objectives. This methodology can be defined using many ways. For example, to Plomp and Nieveen (2007), it combines other approaches to product new theories, artifacts and practices which potentially affect learning and teaching. For Mckenney et al. (2013), EDR mixes scientific research with development and implementation of solutions for real learning contexts. Additionally, the context for its application can be any environment where learning occurs, either physical/virtual, adults/children or formal/informal learning.
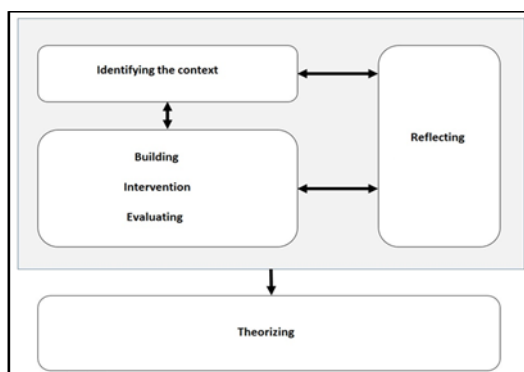

Figure 3. EDR´s Stages (Adapted by Sein et al., 2011).

Figure 4. Digital booklet

Based on the research driving process supported by the EDR, presented by Plomp and Nieveen (2007), McKenney et al. (2013) and Sein et al. (2011), six main stages can be set to achieve the process of action research in the educational context, according to Figure 3.

Therefore, as described before, an experiment was conducted in order to investigate the influence of online boccia games on the performance of real paralympic boccia activities perfomed by the students. We consider this a cycle of our main project, according to the EDR ideas.

Nowadays, another cycle is running. We built an educational digital booklet (Figure 4) which contains all the main related theory about the paralympic boccia, such as its sport´s history, rules, techniques and tactics, among others. The resource has been using with an educational tablet in the outdoor activities to enhance paralympic boccia teaching for beginners with cerebral palsy.

The digital booklet was developed considering Nielsen(1996) accessible design for users with disabilities, as well as the MIT´s Android AppInventor, which uses visual blocks language to support the creation of mobile apps.

To evaluate the booklet, we performed a preliminar experiment whose target audience were 3 students with cerebral palsy, two males and one female, around 40 years old each one, all beginners in the paralympic boccia class. The students were assisted by the tutor, but individually. First of all, the tutor demonstrated how to turn the tablet on and how to open the application. Secondly, the students used the application, but learning just one theoretical item in each class. In order to check student understanding in tablet usage and boccia theory each student was assessed informally through dialogues with the tutor. The learning time of each student was also considered. And then, practical classes in the paralympic boccia court were performed.

Initially we used a qualitative approach to evaluate the experiment, through field diaries, direct observation of the researcher and evaluation protocol. According to our last evaluation, the main difficulties were i) finding the boccia application icone on the tablet, ii) returning to the main menu, iii) touching with just one finger, iv) changing screen.

3. CONCLUSION AND OPPORTUNITIES FOR FUTURE RESEARCH

Considering the rise of Brazilian population with disability, educational institutions are developing extension and research projects to find new strategies to improve teaching and learning respecting the characteristics of the most common disabilities in a particular context.

We have been conducting a interdisciplinary project joining experts and partners from physical education and computer science areas in the Brazilian southeast region.

The main results achieved provide evidence that mobile learning has a potential for this educational context, but we need to understand how to use the student´s life-actions and words as learning spaces, to achieve a theorized and evaluated framework about m-learning in this context, once mobile learning is not only about technology. We also need to achieve a evaluated strategy to assist in the development and support of teachers and coaches of students with a disability who play boccia.

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