

## Chapter 38

# Interactive Digital Mobile Gaming as a Strategic Tool in the Fight Against Childhood Obesity

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### ABSTRACT

*The introduction of new technologies into children's daily routines is in many cases associated with negative health impacts. However, technology may also be used to promote healthy practices by way of so-called serious games. Several studies have confirmed that the use of such tools can result in significant health gains, the adoption of healthy eating habits, the practice of an active lifestyle, increased energy expenditure and decreased adiposity. In this context, the authors report a case study that portrays the process of designing and developing an interactive digital mobile game, designed to motivate children to adopt exercise and healthy eating habits. The player interacts with the game through health metrics, the evolution of the main character, notifications/messages about healthy foods and exercise, and virtual and real-life rewards. The development of a health promotion game is not a simple task and requires a multidisciplinary team.*

DOI: 10.4018/978-1-5225-6915-2.ch038

## INTRODUCTION

Initially, in this chapter, we outline how modern technology has impacted society and health in general, with special focus on problems such as overweight and obesity, metabolic disorders, improper dietary habits and sedentary lifestyles. In contrast, we also look at how technology may be used to implement healthy practices related to physical exercise and nutrition.

Subsequently, we describe each step in the development of a digital exergame, or serious game, called *Missão Kid*, a case study that discusses the use of a serious game based on a theoretical framework. The purpose is to motivate children to adopt an active lifestyle and healthy dietary habits.

## BACKGROUND

Due to improper use, many technological advances in the late twentieth and early twenty-first century, especially in the information technology (IT) sector, have produced negative impacts on health and fitness. As a result, the prevalence of sedentary lifestyles, poor dietary habits, postural deviation, muscular syndromes and injuries, stress and social exclusion, to mention only a few, has increased significantly (Ray, Jat, 2010; Rivera et al., 2010).

The use of electronic devices, such as television, computers and video games, is known to be highly conducive to sedentary lifestyles associated with reduced physical activity, increased ingestion of low-nutrition foods and lowered metabolic rates at rest (Wethington, Pan, Sherry, 2013).

In fact, time spent in front of the TV has been positively correlated with increased adiposity in school children. According to Baughcum et al. (2000), the use of electronic devices (computer, television and video games) contributes to increasing the prevalence of obesity in children. Corso et al. (2012) found a significant association between overweight/obesity and daily hours spent in front of the computer. Carvalhal (2006) reported a positive and proportional correlation between the variables “time spent on video games” and BMI in both boys and girls. Current data suggest that over one fifth of children and adolescents spend more time in front of a TV than recommended (no more than 2 hours/day). This, and the availability of a TV set in a child’s room, is associated with increased risk of obesity (Wethington, Pan, Sherry, 2013).

Despite the well-documented negative health impacts of these technologies, video games may also be employed to encourage children to adopt healthy practices. This opens up a range of possibilities, especially when considering the ubiquity and popularity of video games among the vast majority of children and adolescents today.

So-called “serious games” are digital tools based on the concepts and elements of video games but are designed for purposes other than mere entertainment. Their main objective is to convey messages, promote content and practices, rehabilitate, or provide specific experiences and activities within a motivating and fun framework. Serious games are centred around a practical objective and adjusted to the user’s personal needs (Michel, Chen, 2006).

According to Alvarez and Michaud (2008), serious games allow the user to interact with IT applications while combining aspects of tutorship, teaching, education, communication and information in a leisurely and recreational way.

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