ABSTRACT

This paper is a retrospective case study of a game-based learning (GBL) researcher who cooperated with a professional gamer and a team of game developers to design and develop a coaching system for First-Person Shooter (FPS) players. The GBL researcher intended to verify the ecological validity of a model of cooperation; the developers wanted to assist FPS players in overcoming a bottleneck that hindered players from becoming professional gamers; while the professional gamer desired to venture into professional game coaching. The synergy generated by these individuals resulted in the creation of FPS Trainer. The key challenge encountered in producing the system was to make in-game coaching and learning outcomes explicit while preserving FPS Trainer as a fun game. This paper illustrates how the challenge was overcome and discusses lessons learnt from the case study. The outcomes of the case study would benefit academics or game developers who plan to initiate cross-disciplinary cooperation for making coaching or training games.

Keywords: Cooperation Mode, First-Person Shooter (FPS), FPS Trainer, Game-Based Learning (GBL), Game Coaching, In-Game, Off-Game

INTRODUCTION

The concept of GameCoach™ was initiated by Play2Improve Limited in 2009 through the development of a short 3D training simulation for using infrared (IR) thermal imaging cameras. Real-time coaching technology was used “to provide instant feedback and advice throughout the gaming experience; learning to performance improvement in the correct usage and procedure of these expensive IR cameras” (Play2Improve, 2010). The concept and technology of game coaching was further expanded into commercial game design, specifically in the design of first-person shooter (FPS). FPS is a subgenre of action games whose primary challenge is shooting in the game world that is displayed from the first-person perspective (Adams, 2010). FPS games, such as the Call of Duty series, were claimed to be the most commercially viable game genre (Ingham, 2009).

While tens of millions of players have enjoying the experience of engaging themselves in single-player mode of FPS games, many of them were haunted when they moved on to online multiplayer mode, due to the imbalance playing experience between novice and veteran online FPS players. Conventional in-game tutor-
rial systems and off-game strategy guides were found insufficient for players to overcome the steep learning curve in coping with the change from competing with predetermined non-player characters and bots which are artificially intelligent (AI) opponents in single-player mode (Adams, 2010), to competing with human players in online multiplayer mode. This phenomenon inspired Play2Improve to turn the GameCoach™ technology into a coaching solution for FPS players, hence the genesis of **FPS Trainer** (see Figure 1).

According to the chief executive officer (CEO) of Play2Improve (2011), “the objective of the game is for players to rapidly improve their FPS skills based on sound training principles, in order to become more competitive at any online multiplayer FPS, such as Quake Live, Halo and Call of Duty. Skills will be directly transferable from our game to other FPS’s.” The design of the coaching system incorporated dynamic artificial intelligence programming (Policarpo, Urbano, & Loureiro 2009), principles of instructional design (Dick, Carey, & Carey, 2008), and coaching ideologies in sport sciences.

### In-Game and Off-Game Coaching

Coaching in game world could be in-game, off-game and a combination of both (as shown in Figure 2). In-game coaching is where coaching elements are composed and presented in the main game loop through primary gaming platform or device of interaction; while off-game coaching exists when coaching elements are composed and presented outside the main game loop through secondary or third-party gaming platform or device of interaction.

Main game loop is a concept used in game programming, as depicted by Llopis (2009, p. 248):

...games are driven by a game loop that performs a series of tasks every frame. By doing those tasks every frame, we put together the illusion

![Figure 1. A screenshot of FPS Trainer (© 2010 Play2Improve. Used with permission).](image-url)
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