# PLAYFUL LEARNING

**Alexander Sommers - Jill de Rooij - Dennis Reep - Nick Bijl - Anne de Bode - Loes Bogers**
22 JUNE 2015 - MediaLAB Amsterdam - Studio HvA, Wibautstraat 2-4, 1091 GM, Amsterdam, The Netherlands
**Keywords: serious games, gamification, teenagers with intellectual and/or physical disabilities**

**Goal of the project**
Teens with intellectual disabilities often need extra support in their daily activities. However, when they grow up and leave school they cannot rely any longer on others, such as teachers, mentors and peers to provide them with daily assistance.

*Bandjes* is an educational game through which pupils in special needs education can develop valuable social skills, that these teens regularly struggle with. The game offers a playful way to increase the level of self-reliance, by practicing social skills. This will allow teens with intellectual disabilities to be better prepared for their future lives.

**Serious games, gamification and play**
Serious games are (digital) games that are used for different purposes than mere entertainment (Susi, Johannesson & Backlund 2007). These serious games are used in different contexts such as the military, government, education, corporations, and healthcare. Serious games use game design elements in a non-game context to increase user engagement and to improve user experience. The usage of game design-elements in a non-game context is also called *gamification* (Deterding 2011).

There has been increasing interest within the education branch over the past few years in the usage gamification and serious games to make learning more appealing and fun for children. However the "edutainment games" that spawned out of this, often take the wrong approach in motivating children to learn (Habgood, Ainsworth & Benford 2005). Most of these games take the 'chocolate covered broccoli approach', tagging games onto learning content to make them more palatable (Buckman 1999). Instead of this approach, it is more effective to integrate the learning content into the gameplay design (Habgood, Ainsworth & Benford 2005). The mere act of play already teaches players in imaginativeness, emotional expressiveness, novelty-seeking, curiosity, openness and communicativeness (Lieberman 2014).

In our game, players learn to work together and communicate with each other through gameplay. The learning content is seamlessly integrated in the game-design.

**Designing social interaction**
The design of the game encourages social interaction and physical activity. It integrates learning content with gameplay in a natural, intuitive and fun way. Key design considerations for *Bandjes* are:

• No screen: lots of digital games get played on screens. But by removing the screen, the players can use the physical space they play in. This lets them move around more actively and interact directly with each other.
• Social interdependence: by giving each player important knowledge about the other players, but not about themselves, they are encouraged to communicate with each other and to work together
• Placement of the light: because the light is placed directly above the player's eyes, they automatically look at each other. This creates more social interaction between the players.
• Open-endedness: by using colored LED lights, instead of a screen, the game becomes more abstract. This way it is open for the interpretation of the players, and provides them the opportunity to come up with new forms of gameplay.
• Easy-in, easy-out: players can leave and enter the game without interrupting the gameplay.

**Results**
Prototypes were tested thoroughly and repeatedly at the Orion foundation in Amsterdam, whom offer specialized education for teens with intellectual disabilities, between the age of 12 and 20. These intellectual disabilities vary from different forms of autism to down syndrome.

An important goal and great challenge was to make the game appealing to pupils in all levels of the school and that it is scalable in complexity and challenge so everyone can play. To this end, all iterations were tested with users from each of the different groups and levels. We did 5 days of testing in the physical education classes, with 5 different groups.

User tests pointed out that the dominant playstyle while playing Bandjes was a very active one, with lots of running and shouting. Players help each other actively and talked enthusiastically with each other. At times, they would also come up with their own rules and game variations.

The core concept of our game was easy to understand for pupils in all levels, and players could start playing after a short explanation. In between rounds players could add new elements and try different variations, this way the game slowly became more complex and challenging. The game variations made the game scalable in terms of difficulty and physical challenge. This keeps the game interesting to come back to and play again, and to continue playing as the level of the players advances.

User tests also pointed out that players have a lot of fun during gameplay, while at the same time practicing skills like collaborating, communicating and being physically active.



**Bandjes**
During the game *Bandjes*, every player wears a headband with a light that can change color. The color of the light determines what they have to do or where they should go. Players can only see the color of other players, not their own color. Through communication and collaboration they can find out what color they are and how they should behave in the gameplay. There are 9 different game variations within the colors game, most of them are based on games you probably know, like tag, memory, simon says and other variations on well-known kids' game dynamics. For example: they have to find out their color and then run to an island in one of the corners of the gym class that corresponds with their color.

The game comes with 4 headbands, and an iPad app to explain and practice the basic concept of the game in class. The 9 variations are explained in an illustrated teacher's manual.

**Game variations**
The core concept of our game is easy to understand, and is the basic premises for several other game variations to provide more interesting and challenging games. This way the game can be customized for players in various levels of understanding, communication and motor skills. Some of these variations are:
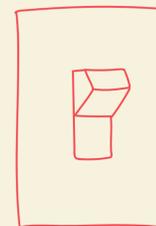


**Keep The Light Out**
when somebody's light goes on, they have to quickly run to the corresponding mat to turn it off.
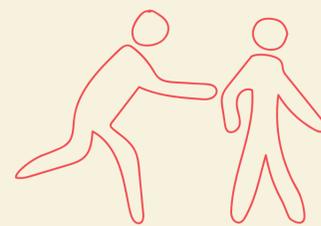
**Tag**
the player who has the red light is the tagger. They have to look closely at the other players to see if they are 'it'.

**Forbidden Word**
the players have to figure out what color they are but it is forbidden to actually say the colors.

**References**

Bruckman, A. (1999, March). Can educational be fun. In *Game developers conference* (Vol. 99).
Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011, September). From game design elements to gamefulness: defining gamification. In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 9-15). ACM.
Habgood, M. P. J., Ainsworth, S. E., & Benford, S. (2005). Endogenous fantasy and learning in digital games. *Simulation & Gaming*, 36(4), 483-498.
Habgood, M. P. J., Ainsworth, S. E., & Benford, S. (2005). Endogenous fantasy and learning in digital games. *Simulation & Gaming*, 36(4), 483-498.
Susi, T., Johannesson, M., & Backlund, P. (2007). Serious games: An overview.

mediaLABamsterdam

Orion SPECIAAL IN ONDERWIJS