

Fingers on the Screen: Game Based Learning for Students with Intellectual Disabilities

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Game Based Learning in the special education classroom is still regarded with skepticism by educators, or has been used mainly as an extrinsic reinforcement. This communication presents a series of observations made by researchers and educators on the motivational impact of games in the educational experience of users with intellectual disabilities.

1. Intellectual disabilities and gaming: motivating the demotivated

Students with intellectual disability or serious learning difficulties are often described as “slow learners” and cannot easily integrate in the normal curriculum. Moreover, most students with ID present limited intrinsic motivation and seem dependent on extrinsic reinforcement such as rewards (or punishments), while overall lack of motivation and low self esteem can cause these students to resist efforts to stimulate their interest in the learning experience.

For many decades, the common attitude towards the motivational abilities of students with ID has been to consider these students as unable to approach the typical logical reasoning and for many decades the main focus regarding motivation, was extrinsic motivation, thus rewards or punishment. However, according to Switzky (1995), researchers have demonstrated over the past years that the efficiency of students with ID is the result of the interaction between personality and internal-intrinsic motivation and sometimes the differences between students with ID and without ID of the same age are actually based on the lack of motivation and experience.

According to Kevin Durkin, videogames draw on various cognitive abilities and “*young people with developmental disorders appear to rise effectively to some of the cognitive challenges the games present and may be motivated in these contexts to achieve levels of cognitive performance that they do not manifest ubiquitously*” (Durkin, 2010).

Until recently, gaming had been used in the special education educational environment almost solely for recreational purposes or purely as an extrinsic motivator. Over the past years, serious games have been documented at the literature review as a highly motivational tool especially for the demotivated users with low self esteem and special educational needs, as well as a potential ally to the difficult task of the SE teachers (Saridaki et al 2009; Brown et al, 2005). Early studies of Malone and Lepper (1987) proposed the usage of digital games as an educational medium, and proved that digital games enhance motivation and learning since the user is more than willing to test his/her knowledge, apply them while gaming and learn and assimilate new information while playing and having fun (Malone, 1980).

Evidence of the motivational power of computer game playing can be found in a report by Standen et al (2006) of a study to design a new navigational interface for people with intellectual disabilities. The users in this study needed to use the device regularly over a period of eighteen months in order to complete a baseline evaluation and to test each version of the prototype. According to the researchers, this was easily achieved by allowing them to play computer games specifically designed for the study.

Regarding students with intellectual disabilities, Digital Games under specific conditions seem to provide appealing human-computer interaction methods in order to enrich the learning process of the students, while helping to improve social relationships, raise the communication level and ease the integration of new concepts that improve the learning process (Gonzalez, 2005; Saridaki et al, 2009). However up till now the design and usage of digital games as a motivational tool for students with intellectual disabilities hasn't been thoroughly documented.

2. Games as a motivational tool in the educational experience of students with ID: reports from field studies

We realized the motivational opportunities that could arise through game based learning after conducting a series of GBL applications' projects in special education settings for a duration of three years. During the EPINOISI R&D project¹ that has been implemented by the Laboratory of New Technologies in Communication, Education and the Mass Media of the University of Athens, and the European GOAL Net Project², we were able to gather more data on the subject of educational motivation and gaming.

The objective of the EPINOISI study was to realize a more than 400 teaching hours specialized training program for primary, secondary and special education teachers supporting students with mild intellectual disability (ID), on the subject of serious games and new technologies. At the same time digital games-based learning (GBL) material for ID students was developed and tested within special classrooms, as part of practical seminars and hands-on activities. Each week the educators had to design a game based learning educational intervention for their students according to different kind of curriculum activities.

1 <http://www.media.uoa.gr/epinoisi/>

2 <http://www.goal-net.eu>

During these interventions each educator documented in detail the design and actual instructional GBL experience.

The majority of the educators stated that games seemed to increase the motivation of the students in participating in the classroom and showing much more excitement in the educational process in general. When games were used in the classroom the majority of the students were excited to participate and often show expressively on the screen their accomplishments during gameplay or tried to communicate with their fellow students pointing to the right direction or touching at the screen the correct answer.

The educators seemed confident in applying serious games in their classroom as a new tool and the majority of the students expressed an increase on their interest towards the educational subject especially if it was introduced through a game along with the classical method. They were also serious implications that they observed a motivational change towards the educational subjects after using games of the same educational topic, thus expressing an augmentation on their intrinsic motivation towards the educational subject. They characterized the gaming experience of the students as "highly motivated" and "engaging towards the educational content" (Saridaki et al, 2010).

However these implications required further testing and we had the opportunity to test these observation in the European project Goal Net study, conducted a year after. Ten educators were asked to use specifically designed games with their students for three weeks and were questioned on the motivational possibilities before and after the gaming interventions. According to the vast majority of this small sample, the educators expressed their belief that games were a good way to introduce various educational subjects and they were able to observe changes on the will of the students to participate in the classroom and learn more about the educational subject as long as it was involved in the game. The educational content integrated in a gaming scenario was much more intriguing for the students who seemed unwilling to participate during the classical educational method.

The also pointed out that communication between the students was augmented during and after gameplay and that the teacher should always make connections between the gaming subject and the educational subject during the classical teaching methods in order to succeed in creating a connection between in game skills and curriculum knowledge or real life skills. It was also mentioned in various occasions the during the lesson, or

at their home, students would made various questions regarding the educational content (e.g. vocational training, road safety etc) after having used a game of the same content.

During our studies it was observed that students with mild ID and their educators preferred games with concrete storytelling rather than drill and practice games. According to our results, storytelling is an important factor in the experience of the user and simple drill and practice games seem less appealing and successful than games with a concrete and interest storytelling. At the same time games that offered personalization were characterized as more appropriate for our target group.

3. Conclusions and Future Studies

According to the majority of the researches and case studies, games offer a judgmental free platform where peer disapproval is absent, failure is just a drive to repeat and try again, while specifically designed adaptable games deal with academic educational material and everyday issues and difficulties such as isolation, lack of parental attention, poor living conditions etc.

Until recently, digital games have been used in the classroom for users with cognitive impairments as an external inducement. However, even if it is widely recognized that games are important in early learning, as education becomes more formal games tend to be seen as just an “*unserious activity*” (Pivec, 2007).

According to our three years studies with various groups of teachers and students with intellectual disability, we have observed that games can be able to augment the intrinsic motivation of students with intellectual disability towards learning and classroom participation. The majority of the educators characterized the GBL applications as highly engaging, motivating, communicative and exciting for the students that seemed eager to participate and cooperate in order to play the game. These qualities require further investigation in order to prove that game based learning can or cannot be an intrinsic motivation tool and under which circumstances.

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