Teaching the Relevance of Game-Based Learning to Preschool and Primary Teachers

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Abstract

Nowadays there is an increasing need for teachers to help learners engage with learning and keep them motivated, as well as a need to familiarize teachers – adults who have not been familiar with computers and hence regard their use in education with a greater or smaller degree of anxiety – with the use of the new technologies in education. We believe that helping teachers, adults, understand the importance of games in learning, as well as how to use game-based teaching and learning, will meet both of the needs mentioned above. Game-based learning has been found to promote a positive attitude towards learning and develop memory skills, along with its potential to connect learners and help them build self-constructed learning. Our paper attempts to distinguish between traditional and digital game-based learning, highlight the advantages and disadvantages of this type of educational approach and propose ways in which preschool and primary school teachers/adults may be taught the relevance of game-based learning, as well as methods to apply game-based teaching-learning techniques in class.

Keywords: educational games, teaching method; game-based learning; digital game-based learning

1. Game-based learning: from the particular to advantages and disadvantages

The pedagogical issue of the game has been a very serious one during the recent five decades. Creating and developing electronic games has opened a new space of investigation and formative action, despite the – often justified – prejudices and critiques of many adults (parents, teachers). Game has become so important within formative action that some authors discuss the concept of “Ludic epistemology”, whose role is that of analysing the traditional knowledge theory and identifying the way in which it may be given life in education through games (Castell, 2011).

Any type of game is the expression of the ludic nature of the human being. From entertainment and recreation, to learning and behaviour change (Connolly et al., 2012), games are necessary and useful. The outcomes of playing...
games may be intended or unintended. Games meet the fundamental needs of learning by providing us with enjoyment, passionate involvement, structure, motivation, ego gratification, adrenaline, creativity, social interaction and emotion (Prensky, 2001).

According to the finality of the game and how it is built, there are educational games (game as play, generally) and didactic games (game as specific function of school learning). The former has educational finalities, but is practiced non-formally and informally, anywhere and anytime, with or without adult supervision. Educational games are games explicitly designed with an educational purpose, or which have an incidental or secondary educational value, meant to teach people about certain subjects, expand concepts, reinforce development, understand an historical event or culture, or assist learners in acquiring a skill while playing; game types include board (for example, pure strategy and/or rolling dice), card (playing cards) and video games (involving human interaction with a user interface to generate visual feedback on a video device (Keesee, 2012).

The didactic game is specially conceived for the instructive-educational context, integrated and fully exploited inside it, under careful supervision and monitoring of teachers. From the perspective of didactic games, game-based learning (further referred to as GBL) is defined as a type of game play which has defined learning outcomes. Generally, GBL is designed to balance subject matter with game play and the player’s ability to retain and apply the subject matter to the real world. It is approached from various perspectives: educational method, didactic procedure, organization of the teaching-learning activity.

The increasingly relevant transformation of the educational game into the didactic game was achieved at an increasingly fast pace, to the extent in which the modern theories of effective learning have shown that learning is most effective when it is active, experiential, situated, problem-based and provides immediate feedback (Connolly et al., 2012). Games appeared to offer activities which have these features.

Educational games may allow for multiple classifications (Connolly et al., 2012), these being closely followed by the systematization of didactic games. In relation to the unprecedented progress of technology, we may draw the distinction between traditional GBL and digital GBL (Anderson et al., 2009).

Traditional GBL have developed for more than 30 years, starting with the 70s, revealing the trainers’ concern for using them for a variety of tasks and lesson objectives: facilitating the understanding of knowledge, illustrating concepts, building skills, retention and transfer, evaluating acquisitions but also maintaining the students strongly involved, motivated and engaged in the task (idem).

Digital GBL are the expression of connecting the teaching process to the new learning technologies, the classic computer and/or other related devices or possibilities (iPod, iPhone, console, smart board, platform). Prensky (2001) will identify and analyse a set of 12 features characteristic of digital games: 1. Games are a form of fun (enjoyment and pleasure); 2. Games are a form of play (intense and passionate involvement); 3. Games have rules (structure); 4. Games have goals (motivation); 5. Games are interactive (doing); 6. Games are adaptive (flow); 7. Games have outcomes and feedback (learning); 8. Games have win states (ego gratification); 9. Games have conflict/competition/challenge/opposition (adrenaline); 10. Games have problem solving (creativity); 11. Games have interaction (social groups); 12. Games have representation and story (emotion) (p.1). In an attempt to distinguish between traditional GBL and digital GBL beyond their shared aspects, the mentioned author will show that, according to Erhel & Jamet (2013:157), “one of the medium's key characteristics is the “coming together” of serious learning and interactive entertainment. In other words, digital learning games can be regarded as an entertainment medium designed to bring about cognitive changes in its players”.

The most relevant advantages of GBL are: promoting a positive attitude towards learning and developing memory skills, along with its potential to connect learners and help them build self-constructed learning (Anderson et al. 2009, Whitton 2012); involving the entire class of students in the active learning process (Anderson et al. 2009); it may constitute an efficient and effective tool for motivating students and engaging them in active learning; besides active learning, GBL also supports experiential learning, thus complying with the demands of the student-centred approach to education; providing a transdisciplinary approach to education as students may work on multiple skills related to various disciplines: research, problem-solving, leadership, team-work, creativity, logics, taking decisions, adaptation, communicative and interaction skills.

Some of the disadvantages of GBL are related to: the time component involved - it is difficult for teachers to anticipate how much time students may need to accomplish all the levels of a game and thus regard the educational game-related task as completed; establishing a deadline for the students to end the game may result in
discouragement and low self-esteem for the students who would not be able to complete the task in the given amount of time; the different decisions that students may take while playing the game may lead to exposure to different learning material or content: this may further result in the teacher’s difficulty to identify if and what students have learnt, as well as possible flaws/gaps in the evaluation.

Some of the advantages of digital GBL are: the player/learner is at the centre of, and expert in the activity, which enhances his self-esteem; the versatility of digital games: the universe of the game responds to each of the player’s actions; everything is possible in a digital game; things are relatively simpler compared to the real world; the games work on a trial and error principle, there are no risks; digital games do not force children to learn but provide learning opportunities every second, enhancing learner motivation. Digital game-based learning involves the following four steps: doing (sensing) – being engaged in the activity; reflecting (perceiving) – looking back for discussing impartially; linking (intuition) – linking to ideas and experiences, seeing possibilities; planning (judging) – reviewing and deciding the next steps (Tam & Hui, 2011).

Some of the disadvantages of digital GBL are: excessive digital GBL presents the risk of gradually eliminating classroom interaction, generating computer addiction and diminishing social, interactional skills, since all the information needed in the teaching-learning process is displayed on the screen (Keesee, 2012).

Such issues do not make the use of games in school learning impossible, but they do need to be solved before introducing game based learning in the curriculum.

2. Teaching the relevance of game-based learning to preschool and primary teachers

In today’s age of technology, there are yet adults – among which, preschool and primary school teachers – who have not been familiar with computers and hence regard the use of computers in education with a certain degree of anxiety. Although yet underexplored, the potential of games to support adult learning is a certainty.

Among the factors which hinder a higher level of computer familiarity among adults are the unfriendly interfaces of the various sites and the allegedly time consuming feature attributed to accessing digital information. Moreover, whereas children seem to be naturally motivated to play games, applying GBL to adult learners (teachers, in our case) raises certain issues: the age difference among these adults (younger adults may be more open to using GBL for their own learning, as well as for teaching, than older adults); teachers of all ages may be reluctant to apply GBL to adult learners, due to the risk of losing control over the teaching process and the learned content, which may generate the feeling that their autonomy and professionalism may be undermined (however, we believe this cannot be the case with preschoolers and primary school learners); the traditional way in which older adults have been trained and formed may generate lack of confidence in the GBL’s potential to achieve effective learning (Charlier et al., 2012). But, for preschoolers and primary school students, games represent an essential part of their learning process. This is why we shall further attempt to discuss how preschool and primary school teachers may be taught the relevance of using as many games as possible in the classroom.

We believe that an appropriate way of teaching preschool and primary school teachers the relevance of game based learning would be to teach them some content by having them play games. As an autonomous educational institution having the necessary qualified staff and technical support, “Vasile Alecsandri” University of Bacău may provide the ideal setting for such workshops and seminars. Such workshops may also be organised during the teachers’ “Methods’ day”, which, in the Romanian educational system, is a day during which preschool and primary teachers from different kindergartens and schools in a certain area meet once a month and share their ideas, experience and information on a previously established educational topic. This would have the advantage that teachers may meet during working hours. The structure of our workshops may be:

- games for developing creative skills: digital and traditional – Decorate the Christmas Tree, Create your Own Halloween Mask, Sort Fish; digital – Magic Paint Brush; traditional – Collective Story.
- games for developing logic skills, choices and decision making games: traditional – Stories’ Entanglement; traditional and digital – puzzles and labyrinths;
- games for developing correct speaking skills: traditional – Let’s Build Words, Words Stew, The Bear and the Bees; digital – Sing with Me, Let’s Create a Poem, Talking Friends;
motor skills: for digital motor skills (mouse control) all the digital games mentioned above; for moving different parts of the body or the whole body, traditional songs such as: *If You’re Happy and You Know It, I Am A Music Man, Superman*;

understanding spatial concepts: traditional – *Childhood’s Universe*; digital – *Build a Pipeline, Find a Way out of the Labyrinth, Treasure Chest, Treasure Island*.

developing sensory skills: traditional – *Autumn’s Basket Full of Fruits*; digital – *Create Christmas Decorations, Decorate the Christmas Tree, Decorate your Room, Dress your Character, Match the Animals to their Sounds*.

Some of the games mentioned above may serve the building of several skills: e.g. *Stories’ Entanglement* may suit the development of correct speaking skills, but also of logical and analytical thinking.

For each workshop, the preschool and primary teachers involved may take turns in selecting, presenting and explaining to the others one (preferably new or with as high a degree of innovation as possible) game which may be applied to preschool and primary school students in class. The teacher having the presentation will have the other teachers participating in the workshop play the respective game for themselves, according to the principle of learning by doing. Having teachers share and play the games themselves may build and develop their digital skills, provide support in terms of information on how a game should be played, diminish the time needed to understand a new game, provide concrete ideas on how to apply the respective game in class, anticipate problems which may arise while having the children play the game in class and provide possible solutions to them.

The games which teachers may present during the above mentioned workshops or seminars may be taken from the reference literature or invented/created by the teachers themselves. When designing a didactic game, one should have in mind its basic structure (Dumitriu, 2011). The basic structure of a didactic game consists of (Măţă & Cojocariu, 2011): 1. the theme/subject of the game and the content should be formulated and selected according to the age of the participants/students; 2. the didactic aim represents the educational finality of the game; it should be formulated as clearly as possible; 3. the operational objectives are specific finalities, concrete, observable and measurable; their number may vary between 2/3 and 5/6; 4. the didactic task (the instructions) of the game is formulated according to the content of the activity and the children’s age level; it is the training element around which the thinking operations are centred; for children this is a thinking problem (recognition, naming, comparing etc.); 5. the rules of the game are pre-established and compulsory for all the participants; 6. the game elements are usually established in relation to the game’s didactic requirements and tasks; a game may imply several elements, for example: (individual or group) competition, cooperation, (moral, material) rewards, penalty in case of violation of the game’s rules, applauses, encouragement; 7. the didactic strategy consists of the didactic procedures involved, the didactic means (the materials) and the best form of organizing the game; the materials should suit the content of the activity, the age and individual particularities of the children (toys, individual sheets, cards etc.); 8. the stages to be covered while playing the game and their correct order; 9. the game versions (complication) refer either to complicating the items of the game or applying the game to other ages of children; keeping a record of the versions has formative valences for the preschool teachers because building them contributes to developing creativity, as well as the possibility to deal with concrete situations during the activity.

Once the preschool and primary school teachers have been taught how to play educational games, they may easily apply them in class.

3. How to apply GBL in class

In this section of our paper we shall try to illustrate how preschool and primary school teachers may apply traditional and digital GBL in class. For this, we shall describe how a traditional and a digital game may be used in class, taking into consideration the stages of conducting a didactic game (Dumitriu, 2011; Măţă & Cojocariu, 2011). Given the age requirements of digital games, we shall attempt to show how a traditional game may be applied to a group of preschoolers and how a digital game may be applied to a group of primary school students from the 1st grade.
3.1. *Stories’ entanglement – traditional game for preschoolers (5-6 years)*

Theme of the game: fairy tales. Didactic aim: to build logical, critical and analytical skills, and creativity. Didactic task: to match the characters with the stories they belong to; to create more stories. Operational objectives: to identify the stories to which the characters belong; to pronounce correctly names of characters and the stories’ titles; to tell briefly what the stories are about; to build new stories.

- **1st stage:** Introducing the game. The preschool teacher introduces the children into the game atmosphere, preparing them for the activity. It is necessary to familiarize the children with the game’s content elements, in order to motivate them: the teacher asks the children to mention their favourite stories. The children are expected to say *Little Red Riding Hood, Snow White, Beauty and the Beast, Cinderella, The Little Mermaid, Rapunzel* etc.
- **2nd stage:** Announcing the title and aim of the game, synthetically and clearly: *Stories’ Entanglement*.
- **3rd stage:** Presenting the materials for the game will be done so as to contribute to creating a pleasant atmosphere, suitable for the game: pictures of the characters from the stories mentioned above, boards with sceneries characteristic of each story.
- **4th stage:** Explaining the rules and providing an example, to ensure that the requirements of the game and the succession of the games’ actions have been understood. Establishing the rules, for example, children should try to raise their hand up and be invited by the teacher to speak before speaking, or children should try to answer by using sentences of the type: “Cinderella does not belong to the board with the underwater landscape. She belongs to the board with the pumpkin chariot.”
- **5th stage:** Performing a trial game, demonstrating the actions of the game and their succession, showing how to use the didactic material. For example, after saying that a certain character belongs on another board, the child goes and pins the picture of the character onto the proper board.
- **6th stage:** Performing the game by the children represents, in fact, the main stage of the game. The children will perform the actions and the teacher will supervise the completion of the actions, compliance with rules, the participation of all the children.
- **7th stage:** Complicating the game implies creating a version of the game by introducing new elements, as well as increasing the game’s level of difficulty. The teacher will congratulate the children for their activity so far. Afterwards, the teacher will again place the characters on the wrong boards and ask the children to look at them and create a story based on, for example, the picture of Rapunzel pinned on the board of the story of *Little Red Ridding Hood*. Initially, the children will not accept the modifications and will continue with the line of the story as they know it, but gradually they will get accustomed to the idea and show creativity by inventing new stories. Thus, lateral thinking is built.
- **8th stage:** Ending the game and evaluating it: the teacher shares appreciations and conclusions regarding the involvement of the participants, their behaviour and answers during the game.

3.2. *Plant and Animal Habitats – digital game for 1st graders (7-8 years)*

Theme of the game: plants and animals. Didactic aim: to build logical, critical and analytical skills. Didactic task: to match animals and plants to their habitats. Operational objectives: to identify the plants and animals in the game; to identify the features of each habitat; to match the animals and plants to their habitats.

- **1st stage:** The primary school teacher introduces the topic of the lesson/game by asking the students to give examples of their favourite animals, plants and tourist destinations. The children are expected to name as large a variety of names of plants, animals and tourist destinations as possible.
- **2nd stage:** The teacher announces the title and aim of the game, *Plant and Animal Habitats*, respectively matching the plants and animals shown on the screen to their living habitats.
- **3rd stage:** The teacher starts the application on the teacher’s computer.
- **4th stage:** The teacher explains the rules and provides an example by running the game on his/her computer and showing how to proceed to playing the game.
- **5th stage:** The teacher also shows the students clues on how to enable descriptions of habitats, plants and animals, adding that activating such helping clues will result in less time for completing the game.
• **6th stage:** The students play the game.

• **7th stage:** A more complicated level of the game implies saving the planet by matching correctly the species of plants and animals from Earth to their proper habitats, within a given amount of time. If the matching is not done within the time limit, Earth will be invaded by aliens.

• **8th stage:** The teacher shares appreciations and conclusions regarding the involvement of the participants, their behaviour, the time it took to complete certain levels of the game and also consolidates the new information acquired by asking the students to talk about the characteristics of a species of plants and/or animals, about which they have learnt something new/interesting while playing the game.

4. Conclusions and action lines

The issue of thorough learning with the help of games remains yet a challenge. On the one hand, games affect intrinsic motivation in a positive way, promoting the desire for repeating the pleasant experience and encouraging individuals/learners to undertake activities in which they have no previous experience; on the other hand, there are still prejudices related to the idea that learning should be painful, therefore any other type of learning which does not mean suffering, does not lead to real, valuable knowledge (Prensky, 2001). Moreover, unless they are meant for very young children, games are usually regarded as a waste of time and irresponsibility. But, in order to teach learners how to learn through games, we, adults, should know how to learn through games ourselves.

By combining the perspective of adults’ education with the process of training for the teaching career, our study has led to formulating the following possible action lines: the need for intensifying systematic theoretical studies on GBL and the models for designing and practically achieving them; instrumentalisation of students in the process of training for the teaching career with the skill of integrating and exploiting digital GBL in the educational process; creating, together with the students, a digital GBL collection for the various ages of pupils (preschool, primary, middle school) and their experimentation/optimization in the teaching practice activity; designing complex ludic teaching sequences, by combining traditional and digital GBL, for all the known types of lessons and for the different events of a lesson; developing programmes for training trainers with a view to designing, integrating and exploiting traditional and digital GBL in the teaching process and/or in non-formal education; developing training programmes for adults (parents, managers, people working in human resources and communication) with a view to designing, integrating and exploiting traditional and digital GBL in specific activities.

The use of games to teach educational content inevitably raises the question of their compatibility with deep learning (Erhel&Jamet, 2013). Despite their disadvantages (related to time, teacher control, classroom interaction), games have a series of undeniable positive features: using one and the same game to develop several skills in students at once; overcoming shyness; increasing self-confidence; learning theory in a pleasant way and, sometimes, in a shorter time; providing visual, life-like examples for practical situations; involving all the students in the class; forcing all learners to undertake learning, discovery, thinking and doing, thus enhancing self-esteem and self-improvement. We believe that the most relevant disadvantage of using games in the classroom is related to evaluation: it may be difficult for the teacher to assess what students have learnt from the game; students may have made different choices and, thus, reached diverse (non-standard) pieces of information; students may need different time limits to complete a game. In order to exploit the advantages of using game-based learning in class, there is a clear need for standardization and regulation on the use of games in teaching-learning-evaluating. Until such regulations are elaborated and implemented, games remain a great, fun way to teach and learn to be applied in class not on a regular basis, but rather now and then.

References


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