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## **Games as a Tool in Education. Experiment in Teaching/Learning Competences by Student in the School**

### **ABSTRACT**

The popularity of games, both computer ones and those with a board, does not surprise anyone these days. They are played by both youngest children as well as adults. It may thus be worthwhile to introduce games into academic education as one of educational activities. For thanks to a game, one can better understand a given problem, actively participate in its resolution, but also study material from a given lesson unit. Whether educational games work out as tools in educating students and whether they can be recommended to learners at the primary level of education – it will turn out in the further part of the article. Our intention is to carry out an experiment in which we wish to compare two groups of students, one of which (the experimental group) is using games during their classes, whilst the other one (the control group) is not using such games and acquires material in the traditional form.

In this article we have decided to check what effects can be attained by introducing the method of work with a board game, at classes on two

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obligatory subjects taking place on two different colleges in Poland: developmental psychology at the Nicolaus Copernicus University in Toruń and rudiments of the history of art at the University of Gdańsk.

**Keywords:**

game, teaching methods, learning, student

## 1. INTRODUCTION

The popularity of games, both computer ones and those with a board, does not surprise anyone these days. They are played by both youngest children as well as adults. The modern pupil/student can be a player who in his/her leisure time trains on a computer such competencies as: persistence in reaching one's goal, optimism, happy productivity and the ability to use networks of contacts by joining communities online. As Sławomir Koziej writes: "the computer very often comments decisions of the learner by giving sound signals [...] it awards with praise each successful task performance" (Koziej, 2008, pp. 52–53). This motivates to further work, activates and shapes the character of "a man of success".

It may thus be worthwhile to introduce games into academic education as one of educational activities. For thanks to a game, one can better understand a given problem, actively participate in its resolution, but also study material from a given lesson unit.

Whether educational games work out as tools in educating students and whether they can be recommended to learners at the primary level of education – it will turn out in the further part of the article. Our intention is to carry out an experiment in which we wish to compare two groups of students, one of which (the experimental group) is using games during their classes, whilst the other one (the control group) is not using such games and acquires material in the traditional form.

This type of research has been done, yet not in Poland. Malathi Balakrishnan, Shabeshan Rengasamy and Mohd Salleh Aman (2011), carried out a quasi-experiment, in which they studied the effect of teaching games for understanding approach on students in Malaysia. Their study investigated the effects of teaching games for understanding approach on students cognitive learning outcome (p. 961).

In Poland research on the use of board games in education of students/learners are not performed. What is more, also in course books for elementary education – as

it follows from an analysis of course books for forms 1–3 (see Karczmarzyk, 2013, pp. 303–313) – are either seldom used or not used at all. It is outside school that pupils learn through games important abilities and competences.

This is why in this article we have decided to check what effects can be attained by introducing the method of work with a board game, at classes on two obligatory subjects taking place on two different colleges in Poland: developmental psychology at the Nicolaus Copernicus University in Toruń and rudiments of the history of art at the University of Gdańsk.

## 2. THE METAPHOR OF MODERN STUDENT

Game started to be so important during pupils' life that it became academic field. The BA (Hons) Computer Games Design course is within the Humanities Faculty of Arts, Business and Applied Social Sciences at University in Suffolk. Students are engaged in the study and production of both digital and non-digital games over three course-years. Students engage with key aspects of game design and game mechanics for paper-based and digital games.

Game may be defined in reference to Pierre Bourdieu's sociology. Ambiguous approach of the author to the game itself assumes always some degree of the player's involvement. In totalitarian institutions, such as, e.g., hospitals or prisons, "unnatural" involvement in a game changes its significance (Jacyno, 1997, p. 17). The game becomes a purpose for itself, so unreality would be more real than reality. According to Bourdieu, such strong involvement in a game reflects our social life (p. 18). The illusion of personal "self" corresponds to both accepting a given role and playing it, as well as to linguistic imitation, which by acceptance influences the individual's identity. In the same way, the real game "brings up" and educates a child/student. Suitably constructed game can make a player think and generate creative solutions, and not only replay a message passively. The game that absorbs a player so deeply that it makes durable changes in a person may also lead to changes in his or her identity. Therefore, it is possible not only to influence transmission of knowledge, but also to educate and shape some behaviours, thinking and personality patterns. While constructing a game it is worth remembering that is meant to creatively activate a schoolchild or student.

### 3. METHODOLOGY. PEDAGOGICAL EXPERIMENT

The aim of the experiment was confirm the way of improving effectiveness of student education in academic knowledge: on history of art and developmental psychology, thanks to using board games as a didactic tool. The experiment's assumptions entailed dependence of the structure of didactic activities on the new form of work constituted by new didactic proposals, board games, and, what follows, better acquisition of information.

A pedagogical experiment was defined by W. Zaczyński as ‘a scientific method of studying a specific fragment of reality, consisting in activating or only changing the course of processes by introducing into them some new factor and observing changes created as its result’ (Zaczyński, 2003, p. 56). Such a study definition was also adopted by the authors. The experiment was conducted by technique of parallel groups, sometimes called the technique of comparison in pairs. The experiment shall cover a cycle of classes meant to prepare students of rudiments of history of arts and developmental psychology. The work with students rested on tasks and actions. The experiment took place in two academic establishments: the University of Gdańsk (UG) and the Nicolaus Copernicus University in Toruń (UMK), with groups of 100 students of UG and 100 students of UMK, all students completing pedagogic lines of study. Either of the groups was divided into two subgroups: experimental – 50 people, and control group – 50 people. During the academic year the students from the experimental group designed, made and played educational games relating to the subject matter which their classes concerned. The control group had lessons in a classical class-based fashion, with mixed methods being used, i.e. group work, discussions, classroom talk, presentations, individual work. For normalisation purposes, the materials used during classes were identical in both groups studied. Evaluation of the classes took place at the last meeting with students, both in the control and the experimental group. The running of evaluation was meant to check the effectiveness of educational games, in the field of history of art and developmental psychology. All the students received a test checking on their knowledge – UG students in history of art, UMK students in developmental psychology. The test contained 25 items and was the same for both groups with developmental psychology and history of art.

The aim of the study was to test the hypothesis stipulating that regardless of the type of classes conducted, introduction of board games as an educational method is an effective way of working with students at pedagogical studies. The tasks posed to students created extensive possibilities of active work in the organisational process.

#### **4. UPBRINGING THROUGH ART – EXAMPLES OF GAMES**

The exemplary games realised by the Gdańsk University students concerned upbringing of the youngest child through art. At the same time they educated the student creating that too. During game preparation students have to analyze material to prepare questions and answers. They were suggested to make two groups of question- easy and hard. That simply task made students think more about analyzed material, decide which parts are easy one and which are more difficult. Final results were really rewarding. During one semester students prepared three games covering different parts of subject.

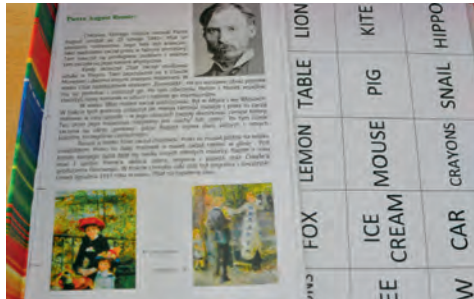
Computer games, board games, educational books that include basic knowledge of, e.g. the history of art and educational exercises using paintings of Paul Cezanne, Auguste Renoir Salvador Dali, Vincent van Gogh, Jacek Malczewski, Józef Chełmoński, Leonardo da Vinci, Pablo Picasso and many others, develop not only the process of reading, excite imagination and creativity, improve mathematical and logical skills, but they also introduce a child to the world of art and culture (Karczmarzyk, Banasiak, 2014, p. 493). The appraisal of such activities is very positive, resignation from classic encyclopedism makes the students, as they said themselves, come to activities with interest and curiosity (p. 494). Joey Lee, from the Games Research Lab at Columbia University Teachers College in New York, says videogames allow students to explore, be curious and persist through negative outcomes (Banchero, 2013).

This type of interactivity imposes on the learner-player formation of appropriate competences and relates to the model of the contemporary world characterised by dynamics, diversity, change, development, media-orientation and virtuality. This is why is worthwhile that educational games impact on comprehensive development of the child, as this is required nowadays. They should thus influence flexibility of thought, develop mathematical, logical, strategic, leading and linguistic competences. They should also integrate knowledge acquired by the child at school with that from outside it. In this way they will be somewhat of a 'revision' of knowledge learnt at school and become an interesting instructive fun.

Examples of games:



Picture 1. Board game – Gallery.



Picture 2. Art game.



Picture 3. Card game – Salvadorek.



Picture 4. Card game.

## 5. DEVELOPMENTAL PSYCHOLOGY – EXAMPLES OF GAMES

Students of pedagogical studies at the Nicolaus Copernicus University prepared during the winter term of 2014/2015 educational games from developmental psychology. The material was divided into subsequent stages of development. At each class they analysed in groups of five a portion of material, after which they prepared questions to the game, whilst the second part of the class was devoted to preparation of the game itself, that is counters, rules, instructions, etc. After about five 90-minute classes the games were ready. During next meetings the students played their games, exchanging them between groups, and also made up new portions of questions on next stages of development analysed during the classes. Since the onset there applied rules of games creation introduced by the teacher:

1. Games were to be constructed in such a way that questions could be added as the material grew. (Each game had finally about 240 questions on developmental psychology.)
2. A game was to have clear and readable instructions.
3. The basis of the game were questions on developmental psychology, after each move a student was to answer a question pertaining to the subject.
4. A game was to be made manually by the students, preferably with the use of recyclables (counters – bottle lids etc.)
5. The form and rules of the game are to be established by the students.

The classes favoured talk and creative actions, they naturally prompted work on the material at home, with the time for carrying out tasks appearing short and issues being interesting. On completion of the classes the students spoke about having become integrated and having had opportunities to meet and talk. Such student opinions lead to splendid conclusions that the educational process engaged not only the mind but also emotions, which generally leads to excellent results. The final test turned out very well, yet it is not an effective measure of the knowledge that the students gained during the classes, as the knowledge gained by students through game creation is better mastered than that on other subjects and will remain longer due to involvement of emotions during the educational process.

The control groups worked in the classical mode and during the classes different forms of work were applied: classroom talks, discussions, group work, individual work, mind maps.

The created games were diversified and very innovative. In total, 10 different games were created, all of which contained questions on the same subject matter and yet they were unrepeatable and exceptional. Below photos of the most interesting of them:





Picture 5. Development maze.



Picture 6. Development snail.



Picture 7. From a 3-year old to grandfather.



Picture 8. From kindergarten to seniority.

## 6. RESULTS OF STUDY

The results confirmed the hypothesis that using educational games during classes with students of pedagogy, both in history of art and development psychology yields higher educational effects than those of students from the control group.



**Tab. 1. Correct answers in knowledge-oriented tests in percentage terms**

Students	Experimental group	Control group
	Percentage of answers in test Correct Incorrect	Percentage of answers in test Correct Incorrect
UG students – history of art	80% 35%	73% 27%
UMKstudents – developmen- tal psychology	84% 16%	77% 23%

Source: own study.

The difference in results is not very large, which allows a conclusion that educational games can be used as an additional method of working with students. On the one hand, they can be an educational tool, and, on the other hand, a way of showing a new, alternative method of working with pupils, e.g. in primary school. What is essential are not games only but their creation. The other methods of working with students in the control group also proved fairly effective.

Learning should be fun. And by using games as a teaching method we accomplish that. Games makes students want to learn rather than forced to learn. Students from groups that were preparing games were more satisfied from participating in class, they integrated with other group members. So preparing game not only made students to remember material better but has also psychological influence- increasing socialization and social competences. Groups that didn't prepare games but participated in regular classes, were they could work in groups but also individually, had worse final test result and didn't have that good contact to each other, that other group.

Asked for opinions, the students gave very positive assessment of such a form of classes. They claimed the classes had been interesting and required them to activate their creativity potential. I cannot be denied that those activities allowed them not only to engage in active education, but also in exercising communication in a group, assertiveness, the ability to solve conflicts, as often during work there occurred differing remarks and opinions. The classes were conducive to conversations, creative actions, and they prompted work on the material at home, as the time for doing the tasks seemed short, whilst the issues – interesting. The students spoke about having integrated and having had opportunities to meet and talk. Such student opinion lead to splendid conclusions that the educational process engaged not only the mind but also emotions, which generally leads to excellent results. Drawing a further inference, it might be noted that knowledge obtained by students from the experimental group is better mastered and will stay for longer, due to engagement of emotions.

It is thus worthwhile incorporating into education of future pedagogues and teachers this method of work, as it is still something new and infrequently encountered in academic education.

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