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GAMIFICATION AS A TOOL FOR CIVIC EDUCATION – A CASE STUDY

Keywords: Gamification, educational games, civic education, ecological education, memory

Abstract

The article aims at presenting the possibilities of using games, most of all the board ones, in civic education of children, the youth and adults. The article will demonstrate activities of Pomorskie Stowarzyszenie Aktywni Lokalnie (Pomeranian Society Locally Active-PSAL), which has taken advantage of games in its activities popularizing public participation as well as in ecological education.

Searching for new methods of reaching students is a never ending challenge for teachers, lecturers or educators. How can one make an individual want to learn something? What can be done so that the knowledge is not perceived as boring and is remembered? How to encourage to the practical application of acquired knowledge?

The article presents the possibilities of using games in teaching. Games are a tool that enables to overcome the above presented dilemmas. As a didactic method games are characterised with an immense potential of involving individuals in active participation in the process of acquiring knowledge and skills. This article aims at presenting possibilities a game provides in the process of civic education-informal education of children, the youth and adults. The examples of activities con-

ducted by PSAL in order to popularize public participation as well as the ones regarding ecological education (climate changes, spatial planning and management) will be demonstrated.

Games make a positive model emphasising skills, the development of personality as well as broadening interests. The model that teaches how to cope with new situations rather than provides ready made, the only suitable answers. The ability to search for new solutions, possibility of making mistakes in a safe, arranged space, possibility of repeating, rearranging schemes, withdrawing and testing might contribute to creative outlook at an issue (Jakubowska, 1999). When joining education with creative work one may expect better effects. Flexible approach provides bigger motivation for work and by that measurably affects the knowledge

acquired in this way. It is withdrawal from mundane transfer of information, it stimulates with specific images, which makes the educational process easier and more pleasant, especially amongst the youngest ones having problems with acquiring abstract concepts (Kapica, 2003). A game in groups forces communication between players as well as teaches how to make choices. Skilfully conducted game provides not only the sense of satisfaction with victory or dissatisfaction with defeat. Neither the knowledge acquired according to the scenario is the only measurable advantage of a game. Gamification is a holistic concept-it provides both knowledge and skills thanks to which one can build their own sense of value (Jakubowska, 1999).

Learning may be perceived not only through the prism of acquiring knowledge, but also as social process arranged in particular social surroundings in cooperation with the participants of this process. (Joyce, Calhoun, Hopkins, 1999). It is not a merely activity aimed at itself-learning for the sake of learning. Knowledge is acquired in order to be applied in practice. It is not to be a limitation but a discovery and opportunity.

Memory might be perceived as dynamic process (Bernacka, 2001) which consists of memorising, storing and recalling stages (Chlewiński and others, 1997). The process of learning will be in this case one of the memory parts-memorising. The sequence of presented information affects memory significantly. The situations from the beginning and end of the sequence are memorised better (the effects of beginning and end). Associations, involving other senses, repetition as well as departure from matching elements also act in stimulating way (Bernacka, 2001). The state in which a particular individual currently is also influences on their ability to memorise. In order to achieve this one may use alpha waves emitted while meditating, fantasising or relaxing, as well as due to rhythm and music (Bernacka, 2001).

The points below are the tips that might contribute to better remembering of a material (significant while creating the scenario of games):

1. Group information in a sequence consisting of maximum seven elements (limited capacity of fresh short-term memory);
2. Apply rhythm – the stimulation of both cerebral hemispheres;
3. Introduce the elements of movement (body possesses a certain kind of memory);
4. Use key words-associations and visualisation;

5. Use colours and drawings-stimulation of spatial memory.

One of the methods that seem to illustrate perfectly such a method of teaching are games and plays (Joyce, Calhoun, Hopkins, 1999). A game and a play are synonymous notions. In case of a game there is an additional factor, namely either win or a loss (Putkiewicz, Ruszczyńska-Schiller, 1981). In an exemplary process of a game, the rules will reflect the process of remembering whereas the repetition of a game is not only remembering but also recalling (e.g. good and bad solutions). Hence, one ought to bear in mind that a one-time game, even including involvement, may not influence positively on the memory about it as well as the information included in it. To leave a trace in memory it is important to replay, copy and cascade it. Only then it is possible to embed it (Błasiak, 1996).

For educational purposes several types of games have been distinguished. Ones are of situational character-when a player faces an issue, analysis, argumentation or searching for solutions or a solution. There are also methods that focus on the staging itself-playing roles (Putkiewicz, Ruszczyńska-Schiller, 1981). Other games strongly emphasise searching for associations. One of them being brain storm, in which the first stage is about producing the largest number of solutions even loosely connected with the primal issue (Wiciński, 1997).

Educational games include decisive games, staging, drama, brain storm, meta-plan as well as simulation games. Simulation games derive from military training since they aimed at preparing commanders for action during wartime (Bernacka, 2001). Simulation games include board ones, computer ones, the ones using cards and other objects. Depending on the interpretation of the notion of modelling, sometimes also staging is included in this category. Formalised model of a conflict situation (Putkiewicz, Ruszczyńska-Schiller, 1981, p. 360) and the will for competition are significant factors that class a game into the category of simulation ones.

Simulation games belong to the category of dynamic games in which according to the rules one performs certain actions in order to achieve benefits (Bernacka, 2001). They are characterised with a certain scheme of moves, incomplete stock of information(completed throughout the game by players) and the payout which ends the game. (Putkiewicz, Ruszczyńska-Schiller, 1981) The most significant, however, are the

choices made constantly in the moves (Putkiewicz, Ruszczyńska-Schiller, 1981, p. 361), which aim at winning the game.

The outcome of the game does not comprise merely the cognitive-operational effect since the win largely depends on knowledge and practical skills of players. Another advantage of games is the motivation for the further acquisition of qualifications which might contribute to improving the previous outcome of the game play.

The joy of discovering, coming up with appropriate ideas, satisfaction with the usefulness of the acquired knowledge and the increasing level of competence (...) are emotional states strongly giving personality as a whole more dynamism (...). They provide one with (...) the sense of one's own power, conviction of efficiency and purposefulness of undertaken efforts (Kapica, 2003, p. 200–201)

Games enable limitless experiments without the fear of real consequences as participants still do not act in the real world. Gamification means taking advantage of mechanisms known from games (not only computer ones) with a view of changing people's behaviours beyond the game context (Tkaczyk, 2019). The game, desire to win encourage one for acting. Rules of each game channel the action towards applying knowledge and skills which could contribute to winning. By showing the aim, players may be motivated for the further development in the direction which will offer measurable benefits in the game. Using board games and making them available in spare time may contribute to advantageous motivating of children, the youth and adults for further exploration of the issue, different way of spending free time, enhancing ones confidence in his own abilities as well as self confidence in general.

Gaming takes advantage of the evolution mechanism. Although animals also use playing for learning this refers merely to more developed species. Also children, not fully emotionally developed, get involved in plays which in the long run influence its development. Playing is entertainment, which frequently without a player's intention, aims at training his brain. The feeling of satisfaction provides feedback loop which in return leads to further play which again results in the sense of pleasure.

Interesting form ought to be a significant aspect of a game. Boredom may result to giving up a game without completing it. Therefore, game ought to be directed at stimulating curiosity, so that this stimulus could mo-

tivate for further playing. Game, on the other hand, complements this shortage of knowledge which a participant is aware of and has the need of completing. Thus, curiosity seems to be an indispensable condition for the involvement in the game. Jane McGonigal compares playing to a certain state of trans which allows to submerge in alternative reality. At this very moment players enjoy the task itself and its repetitiveness. To cause the connection of identification with a task three conditions need to be fulfilled:

1. Clear rules and objectives which one should be guided by in the game;
2. Possible, yet not too simple task so that a player could be satisfied with reaching the aim, but also to make defeat less acute;
3. Immediate feedback so that a player could verify his actions (Tkaczyk 2012, p. 70–72).

The state of a player requires from him high level of concentration. It frequently leads to the identification with an alter ego from a scenario, reaching the possible loss of self-conscience (Tkaczyk 2012, p. 52–52). Responsibility is held by the structure of a game as well as mechanisms it is directed by.

The structure of a game comprises the win, aim or aims which may lead to the win, rules that players ought to be guided by, plot of a game as well as obstacles which players encounter while performing subsequent moves. Rules are a separate issue in the structure of a game. Rules applied by players are either imposed or agreed upon. Created basing on the mutual consent. When the instruction for a game does not assume certain events that happen during a game play, players may specify them or interpret their further moves for their favour within the general rules. Since a game is voluntary it happens that even though players know the rules they break them. It may result from a potential reward or the will to win at any cost. On the other side there are players social activists-altruists. For them a game is a way of expressing oneself, and most of all of communicating with others. It often shows in playing in favour of other players and giving up an immediate benefit.

A complex mechanism of satisfaction from a game conditions the dynamics of its course. Players at various stages and for various reasons are conditioned with premises which influence their involvement. The win itself is an obvious motivation, however the course is also influenced by points players gain or lose. Also the prompt feedback on the results a player has achieved encourages the involvement. It will be the knowledge

about all “little bonuses”, the changes in status as well as levels that might be acquired during this process. Every action of a player is followed by a rapid reaction of a game itself. Effects are not postponed, thus there is no fear of losing the eagerness present at the beginning of a game, which happens in the real world when one has to await longer for the effects of a plan in progress. The availability of feedback is an advantage of games they have over real life. (Tkaczyk 2012, p. 82).

To make a game and the process of gamification reach a demanded effect one needs a good plot for a game. It is significant that it does not base merely on collecting points. A game ought to create a kind of entity, a separate world in which participants can submerge in. Being able to end a game in a variety of ways is also an aspect of significance. Linear conduct of a game triggers boredom and the sense of inevitability in players. Various exceptions, capability of influencing the world of a game in a variety of ways is of crucial significance in the involvement of players. A single-track method is characteristic for typical school education, therefore games with multi variant ending are the means of rejecting a matrix both for students or learners as well as teachers, educators, trainers.

Gamification requires cooperation between players. Tasks are frequently constructed in the way that imposes on players the need to co-work with others. Activities modelled in such a way may be a good example to conduct at school, although they are stereotypically far from the classical perception of teaching. The lack of the ability to cooperate, a feature characteristic for many graduates from Polish schools, transforms further on into a deficit on a job market, where co-acting is becoming a desired skill. Taking advantage of games provides not only direct results in acquiring knowledge but also helps in building up competences useful on a job market.

One needs a new outlook at games in education as well as education itself. The rule of punishment and reward seems to be as fruitful as the one in which there are rewards or there are not any. The method of stick and carrot is replaced with a carrot only. Thanks to this players are not afraid of making mistakes-there is no displeasure, instead there might be the lack of pleasure. It is games, not school, that teach rewarding for effort, not punishing for a failure at the same time (Tkaczyk 2012, p. 105). In games one may make a number of attempts, in each case finding out something new on an imaginary world or oneself. Mistakes that are al-

lowed do not weaken the spirit of competitiveness or adventure.

Games are a tool. They may be a time filler treated only as a pastime. However, this tool might also be used to strengthen altruistic attitudes not only in their limited world but also in reality. What is of importance here are motivation and scenario as well as the rules of a game. Hence, particularly in case of the youngest players, a leading person (a parent, a teacher) is of importance. A game, as a tool, is not fully comprehended by children. Especially in the world of computers it is hard to find moderation even for the adults. Playing requires limits. If a player does not possess a stable view on the world, he does not possess the ability of self-limitation either, and has to be limited from the outside.

Taking advantage of games in education requires reference to the phenomenon of gamification. Gamification is like injecting the elements of enjoyment to activities (also products or services) which have not provided enjoyment so far (Tkaczyk, 2019). It bases on stimuli which cause pleasure. Due to this it encourages for acting according to a set scenario. This technique aims at increasing people's involvement by using the rules of games. This involvement is achieved by, e.g. subsequent challenges, fulfilling the need for competitiveness, the will of winning, as well as cooperation. Thanks to gamification potentially boring activities may become the exception to the routine and be perceived as adventure and fun.

Gamification and games are taken advantage of in the activities of PSAL. PSAL was established in 2014. It is active most of all in Pruszcz Gdański, a town with the population of approximately 30 thousand. The main objective of the society is to support activities aiming at the building of a civic society. Therefore it deals with a broadly meant civic education, which focuses on both civic participation by providing tools and abilities thanks to which citizens acquire the sense of influence on shaping their own town. Whereas on the other hand, a number of activities have been conducted that made people aware of the essence of town tissue – the shape of the environment. The workshops on spatial planning have been conducted, as well as set cycling paths, and the mobility potential in the town. The pursuit for cooperation within the town has resulted in the plans of civic participation. The society aims at making people realise the possibilities to affect both their close and more remote surroundings. The workshops organised by the society emphasised the use of games.

According to the rules of gamification, they were taken advantage of in order to use a game in becoming aware of the dependence between economy and space in micro and macro scales. The idea of playing seemed a natural consequence of currently present trends. In recent years the renaissance of board games has been observed. Again, games have become trendy. It was not only families that discovered this way of spending spare time. Games are treated as “natural” environment of young people, which due to the pursuit for winning, natural demand for competitiveness, help one to develop their cognitive pursuits, motivation for acting, further deepening of knowledge, and acquiring information. They make an excellent component of both school and extracurricular activities. Due to their repetitiveness they contribute to gaining abilities which may influence the solution of problems in real life.

One of the projects the society participated in was “Green Games”. Along with Centrum Rozwiązań Systemowych (The Centre for System Solutions), libraries, and non-government organisations an educational-environmental project came into existence that was realised in 2015 (the internet site of the project “Zielone Gry” 2019). It was to increase the knowledge of young people (middle school and university students) on the range of bio diversity, economic value of various ecosystems, and also human activities and their influence on climate changes. What mainly motivated the creators of the project was to pass the knowledge in approachable and attractive way. Therefore, a tool was used that was to be potentially more interesting, i.e. a game. The idea of serious games assumes that a game is not only to amuse but also to encourage for thinking, pass knowledge or gain skills. Two board games and one internet game were used in the project.

The first of games was already known on the market “The Settlers of Catan” with the addition of “The Oil of Catan”. The organisers intended to draw attention to the dependence of the society on the used resources, especially non-renewable ones. Using limited natural resources influences both social development as well as the degradation of the environment. The game highlights the importance of compromises between players and results of the climate destabilisation for weaker “innocent players”. The latter ones are the players who despite the slower use of resources, which means smaller contribution to the global overuse of goods in Catan, suffered in greater extent due to disasters that the land experienced.

The plot of the “Oil of Catan” is a simulation of life on the island of Catan. Catan was rich in mineral resources as well as oil which influenced the pace of development (collecting points). As a consequence of the excessive resource exploitation the island experienced disasters. Players-inhabitants were facing subsequent challenges to compromise the will to win with the safety of the island. The game could end in a catastrophe. There was possible cooperation between players which had positive outcome for players as well as could result in saving the island.

Below, taking “Oil of Catan” as an example the structure of the game is presented and the mechanisms used in scenario to attract players to the board reality are discussed:

Tab. 1. Game „Oil of Catan”

Game structure	<p>The condition of winning – gaining as many points as possible – building a developer Town tissue without destroying the island</p> <p>Aim – development of the settlement, building towns, constructing roads development of the island itself</p> <p>Action – building Roads, towns, trade, production</p> <p>Obstacles – threat on the side of other players, random threats, climate threats caused by other players</p> <p>Rules – action allowed in the scenario of the game</p>
Mechanisms	
Rewards and points	Apart from counted points that regard the development In the game, players can gain the title of environment champion, if they give up the use of oil for the sake of other players
Feedback	After each round
Status	Settlements, towns, ports, metropolises and deposits possessed by a player
Levels	<p>The movement of players result in consequences in a subsequent round</p> <p>The source, i.e. oil, influences the scaling of the game difficulty level</p>
Achievements and Challenges	<p>Random: depending on tossing a dice</p> <p>Regular tasks: construction, trade, and the use of resources which a player has acquired in order to increase the welfare</p>
Competition	The table of results: tokens of oil, other resources, special cards, development towards metropolises
Altruism	Devoting the oil tokens for the welfare of the whole island

Source: author's own study on the basis of the game manual

The second game within the “Green Game” project is “The Rulers of the Valley” – a board game constructed for the sake of this project. The reality of the game is the valley of a river. Players are impersonated in farmers, local authority representatives, and a bank. Participants set the aims of each stage themselves. Farmers take advantage of the valley, its natural resources. Representatives of local authorities collect taxes from farmers. They also act for them by protecting resources against potential threats from the river (floods or drought). Bank provides loans for both farmers and authorities, therefore having influence on the pace of investments. The participants of the game were facing various challenges caused by both their expectations as well as resulting from moves of other players or the environment – the river. The game was available both in a box version and pdf one.

Tab. 2. Game „Rulers of the Valley”

Game structure	The condition of winning – collecting as many złocisz (coins) as possible Aim – managing the Valley by farmers in cooperation with authorities and bank, taking care of biodiversity Action – production, farming, loans, constructing a dam, investments Obstacles – threats caused by the River (drought, floods), ecological disasters Rules – actions allowed in the scenario of the game
Mechanisms	
Rewards and points	Dukaty (coins) for activities
Feedback	After each round
Status	Rich or poor farmers – landlords, local authorities, bank
Levels	No distinguished levels
Achievements and Challenges	The financial outcome, biodiversity, solvency, weather conditions
Competition	The outcome phase
Altruism	Taking care of biodiversity which decreases potential income from farming

Source: author's own sources on the basis of the game manual

The third game in the “Green Games” project is a multiplayer internet game “The Game with Climate 2.0”, available in a PC version and in mobile apps. To play the game one needs to have the access to the Internet to be able to communicate with other players. The application presents a forested island. Depending on the number of players, the island increases or decreases

its capacity. In subsequent rounds each participant may use resources present on the island for his own purposes. He may pick up forest fruit without much influence on the ecosystem or act more intensely cutting down trees to gain profit. However, if the island is deprived of a large number of trees there appear hurricanes which may cause irreversible damage and flood a part of the island. Players may also forest the island again. However, it results in the absence of their own development. The game allows to initiate communication and cooperation between players. It can be used to create a balanced plan of the island development together.

Tab. 3. Game „The Game with Climate 2.0”

Game structure	Condition of winning – gaining such a number of dukaty (coins), that will guarantee a decent level of Aim – reflection on the use of natural resources, welfare alongside with the preservation of the Action – taking advantage of the Island, collecting the fruit of nature, running a business, planting Obstacles – the climate threats caused by players' actions, the flooding of the Island, climate disaster Rules – action allowed in the game scenario
Mechanisms	
Rewards and points	Dukaty (coins) for taking advantage of the resources
Feedback	After each round
Status	Poverty, penury, relative affluence, wealth, complete financial independence
Levels	A move of players causes consequences in the following round. It influences not only the status but also the possibilities players possess
Achievements and Challenges	Taking advantage of the island in the way that that allows satisfactory level of wealth without destroying the island
Competition	The table of results: possibility to compare oneself to other players
Altruism	Giving up opportunity to get rich for the sake of the welfare of the islanders and the whole ecosystem

Source: author's own sources on the basis of the game manual

PSAL does not only use previously constructed games. Members of the society create scenarios of games dedicated to the aims and activities of PSAL. One of them is planning a town together – a board game based on the procedure of making planning documents included in Polish law (Act from 27th March

2003 on planning and spatial management). The game bases on a board divided into fragments characterizing particular areas or boroughs of a town. There are housing estates, service, industrial, entertainment areas, etc. Players impersonate local authorities, investors, ecologists, car enthusiasts, parents. Each player has different needs, which he wants to convince authorities to. However, the game aims at reaching the compromise which will result in a new spatial management plan for the town. The stages of the game refer to the subsequent steps in planning procedure: collecting motions, working on the project, public debate. The board game is based on the materials available in every stationer's.

Tab. 4. Game „Let's plan a Town Together”

Game structure	Condition of winning – convincing other players to one's own vision of city planning- -constructing a developed city tissue Aim – the development of a city Action – construction of Road, house, services, work places Obstacles – threats on the side of other players, threats of fate Rules – activities allowed In the game scenario according to the planning procedures
Mechanisms	
Feedback	After each round
Status	Local authorities, investors, ecologists, car enthusiasts, parents
Levels	According to the legal planning procedures for the zoning: forwarding motions, project, public debate
Achievements and Challenges	Discussion – negotiations, working on the mutual consent
Competition	Convincing authorities and other players to one's own purposes e.g. car enthusiasts – a new road, an investor – a shop or a factory, parents – a kindergarten, ecologists – park or cycling path, etc.
Altruism	Giving up one's own aims for the sake of common welfare or aims presented by other participants (e.g. environment protection, limited budget, availability of services for inhabitants)

Source: author's own study.

Summing up, activities conducted by PSAL indicate positive outcome of taking advantage of games and gamification mechanisms in the processes of civic and ecological education. PSAL acts mostly in the area of informal education. There are, however, no premises allowing to doubt the efficiency of games also in the area of formal education.

The above presented examples of games show dormant possibilities of using a game for educational purposes. While constructing scenarios of either existing games can be modified or one's own board may be created which will serve an issue one wants to slip in the process of a game. Discovering, learning by action activate creative thinking. Games provide opportunity for testing solutions in safe conditions, show how to compete and negotiate, at the same time enjoying oneself.

The experience of PSAL shows that games are a tool of inter-generation integration. Both in “Green Games” project which was addressed especially at the young, as well as in the game regarding spatial planning the participants were children, the youth and adults. In a game there was no inter-generation barrier since each player participated in on the same terms.

Cooperation between institutions appeared to be a significant, or even crucial element. While realizing its projects PSAL cooperates with Town Public Library in Pruszcz Gdański. As agreed with the management some of the games are held in the library. It allows to reach a larger number of people. Thanks to that a bigger number of participants took part in the “Green Games” project than in previous ones that were held in the seat of the society.

Cascading is an important element of playing. Participants of games come back to PSAL with new people willing not only to have fun but also participate in other forms of cooperation. Cascading makes it possible for the ideas that have succeeded not to vanish, but find other organizers and participants willing to share their experience.

Games conducted by PSAL indicate the significance of a moderator. It is a person who does not participate directly in a game, instead he supervises its conduct and presents rules. He may stop a game in order to discuss with all players a situation that is currently in progress. It provides time for changing one's decision, encourages to think over the possibilities players have created and start cooperation, which would not be possible if players were only pursuing the win.

Vast possibilities are hidden in games. Animals play preparing for independent life. People take advantage of them as an aim of its own, but also as a tool for learning new solutions and preparation for changes. Games which alter human patterns of behavior, which change the world for better-are the essence of gamification (Tkaczyk 2012, p. 62).

A game is characterized with flexibility, being facultative, one's own time, space and rules. These are in no way features that are characteristic for educational processes, especially school education. It is worth, however, appreciating potential and positive effects stemming from games and gamification mechanisms. The experience of the authors indicates that particularly non-government organizations and cultural institutions are the surroundings where this tool is the easiest to introduce in order to realize the tasks of civic and ecological education. It is time and place to take advantage of this tool so vastly used in marketing strategies also for the sake of social values.

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