



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

## IO2 – BEST PRACTICES IN GAME-BASED LEARNING METHODS IN ADULT EDUCATION

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Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

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Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

## CONTENTS

I. Literature review on best practices in game-based learning methods in adult education	5
I.1. Introduction	5
I.2. Slovenian literature on best practices in game-based learning methods	5
I.3. Hungarian literature on best practices in game-based learning methods	15
I.4. Romanian literature on best practices in game-based learning methods	25
I.5. Conclusions	29
II. Best practices in game-based learning methods in adult education	30
II.1. Introduction	30
II.2. Collection of best practices in game-based learning methods in adult education used to build creativity skills	31
II.2.1. Gamification in the study of mathematics for engineering students	31
II.2.2. Mobile serious game for enhancing user experience in a museum	32
II.2.3. Coding4Girls Learning Scenarios	35
II.2.4. Planet Hexagon	39
II.2.5. StoryLand of Options - SLO Game	43
II.2.6. Educational Computer Game for Nutrition Education	48
II.2.7. The implementation of SADDIE method in course ICT supported learning materials to support development of teacher competences	54
II.2.8. Castle Of Mind product family	62
II.2.10. Balance <sup>2</sup> movement therapy training method	71



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

II.2.11. Skyhunter	76
II.2.12. Philosophical Theme Card	81
II.2.13. LEVEL UP! Designing game-based practices for migrant children inclusion	85
II.2.14. Improving "Problem solving in technology-rich environments" skill of low-skilled adults with gamification, serious games and LARP – skillUPgame	86
II.2.15. MegaVET "Move to Enhance the Gamified Applications in Vocational Education Training" Project	87
II.2.16. PROJECT: ESCAPE AND FLIGHT	88
II.2.17. USING VIRTUAL REALITY APP IN THE CLASSROOM	89
II.2.18. Hi-Quest	90
II.2.19. ICT game-based learning best practices used to build digital competence	92
II.2.20. Theatre Lab OFF BOOK	95
II.2.21. Integrating the creative arts into the design of teaching - learning - assessment	102
II.2.22. The Labyrinth – role-playing game	105
II.2.23. Walking Tour	110
II.2.24. Digital storytelling with LEGO	111
II.2.25. Escape rooms	113
II.2.26. The Big Book Initiation	114
III. Conclusions	115
References	116



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## I. Literature review on best practices in game-based learning methods in adult education

### I.1. Introduction

In the GAME-ED project, organizations from several countries collaborate to produce various intellectual outputs. The first intellectual output of the project is a COLLECTION OF METHODS ON BUILDING CREATIVITY SKILLS IN ADULT EDUCATION, which includes the definition of the key concepts used in the project, a needs analysis regarding the skills of relevant stakeholders, a literature review on methods for building creativity in adult education, and a collection of methods for building creativity in adult education. This document represents the second intellectual output of the project GAME-ED - BEST PRACTICES IN GAME-BASED LEARNING METHODS IN ADULT EDUCATION - which should be seen as a continuation of the work and outcomes undertaken by the project team to achieve the first intellectual output. This document consists of two main parts: a literature review of good practices in game-based learning carried out at national level in each partner country - the theoretical approach - and a collection of best practices in game-based learning used to build 21st century competences and skills in adult learners - the practical approach. These outputs are aimed at adult educators and adult learners, as well as teachers and trainers working with different age groups of learners.

### I.2. Slovenian literature on best practices in game-based learning methods

**[Sillaots, M. (2014, October). Achieving flow through gamification: a study on re-designing research methods courses. In European Conference on Games Based Learning (Vol. 2, p. 538). Academic Conferences International Limited.]**

In this study, we pursue the idea of redesigning various university courses with gamification. Since most study courses are traditionally taught (with lectures and presentations), students often find the course content boring and dry. One way to engage students in the content and make the course more engaging is to incorporate game elements into the course. The author presented the redesign process of different



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

courses with game elements such as objectives, avatars, random number generator (which determined the group that presented the results of the coursework), positive/critical perspectives, quizzes, experience points, scoreboard, levels, bonus activities. The results show that it is possible to increase student engagement using gamification, as students in the study experienced most flow aspects at a high level. The results show that the courses that included gamified learning activities such as quizzes generated intrinsic motivation - similarly, the courses that included gamified course management such as scoreboards generated extrinsic motivation among learners. Students emphasised the aspect of autonomy that they missed in the courses as they could not fully control their learning activities. Moreover, they were involved in various activities that often involved the use of the random number generator, which further created a sense of unfairness in them. Students also indicated that they were more motivated when they could see the results of each activity they were involved in, rather than just seeing the final score summary without detailed information about their work throughout the course. Students were also confused at some points where the classroom situation became too noisy. They see the possibility of solving some of these problems with digital tools that are easy to use. The author also suggests some solutions to the said problem. Overall, the students were satisfied with the course. They found it interesting and exciting despite the "boring" content.

**[Drgan, M. (2020). *Vpeljava mehanizmov igre v modele poslovanja na spletu* (Doctoral dissertation, Univerza v Ljubljani, Fakulteta za družbene vede).]**

This work focuses on gamification and the use of game mechanics in contexts and systems that are otherwise not game-related. The aim is to find out how gamification mechanisms can be successfully introduced into online business models, as e-commerce has become an important part of the business processes of today's companies. For the purpose of the research and to identify the reasons for using gamification, the paper presents a SWOT -analysis for this area, which provides insights into the advantages, disadvantages, drawbacks and threats of using gamification in online business.

**Advantages of gamification:** (a) motivation of customers and employees, (b) gathering of customer information, (c) customer feedback, (d) customer and user retention, (e) Increasing participation and motivation, (f) Bringing fun and enjoyment to different contexts, (g) Simplicity and speed of implementation, (h) No need to create a complex game world, (i) measuring success using metrics to measure the success of gamification..



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

**Disadvantages of gamification:** (a) game elements are exhausting for some users, (b) the impact of gamification on user behaviour is not fully clear, (c) limited to points, badges and leaderboards, (d) effectiveness depends on the type of service in which it is used, (e) it affects individuals differently, (f) certain game elements (e.g. leaderboards) can create a divide between users, (g) limiting the use of points, badges and leaderboards, (h) 'fits-all' solutions.

**Opportunities for implementing gamification** (a) attention from academia, (b) widespread phenomenon of gamification, (c) large population of video game players, (d) game elements are fun for most users, (e) use of intrinsic rewards satisfies certain user needs, (f) users can share positive experiences with their acquaintances, and

**Dangers of using gamification** (a) the ignorance of users, (b) manipulation of behaviour and ethics, (c) rewards may miss their purpose, (d) poor design, (e) engagement different from what the creator wants to achieve, (f) unknown impact on individuals who are addicted to games, (g) gamification is not suitable for all contexts.

The goal of using gamification in organisations is often to increase the motivation of both employees and users of certain products and services. Since gamification promotes a desired behaviour of the participants, certain ethical principles must be observed when designing gamified solutions. Therefore, the paper also focuses on the ethical and moral aspects of this phenomenon. When designing gamified solutions, it is crucial to understand well the users and the participants of the process in order to know what motivates them and what elements of the games they enjoy, because this is the only way to create a truly successful gamified system and an engaging experience.

[Brezavšček, A., & Minič, M. (2020). *Izboljšanje ozaveščenosti na področju informacijske varnosti z uporabo metod igrifikacije. Uporabna Informatika*, 28(2). Pridobljeno s <https://212.235.189.237/index.php/ui/article/view/92>]

In this paper, the authors discuss the use of gamification methods in education. They briefly describe the elements of gamification, present the main features of these methods and the perceived positive effects on the effectiveness of education itself. Drawing on evidence from the literature and practical experience, they highlight the ways in which these methods can be used to raise user awareness in the area of information (cyber) security. Both literature and empirical experience show that the use of gamification in information security education is associated with a positive user experience, likability as well as an actual increase in awareness.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

**[Černič, N., & Golob, U. (2018). Igrifikacija v storitvenem marketingu: uvajanje elementov iger v proces spletnega nakupa letalskih kart. *Akademija MM*, 13(27), 49-63.]**

This article examines gamification as a concept that is gaining prominence in marketing literature and practice. It addresses the question of the importance of game elements in non-game situations and examines how these elements are relevant to marketing practice. The empirical work focuses on the impact of game elements on different dimensions of user experience when purchasing airline tickets, drawing on the Player Experience of Need Satisfaction (PENS) model, which measures dimensions of the user experience of video game players. The results of an exploratory study in the form of a quasi-experiment showed that elements that increase emotional engagement and physical presence in particular have a positive impact on user experience. This paper discusses the findings and their potential contribution to research and practice.

**[Faiella, F., & Ricciardi, M. (2015). Gamification and learning: a review of issues and research. *Journal of e-Learning and Knowledge Society*, 11(3).]**

This paper reviews the literature on gamification. Using principles of analysis, it attempts to summarise the existing research and identify (controversial) topics and areas related to gamification that should be further explored in the future..

The introduction is dedicated to an overview of the topic (definition of the concept, characteristic components and discussion of experiences with the elements of gamification). After reviewing the various definitions of gamification in the international literature, most consider gamification as an approach that uses the characteristics of games (elements, mechanics, frameworks, aesthetics, thinking, metaphors) in non-game environments. The term 'gamification' is used in the context of a range of topics and aims to engage users and encourage them to achieve more ambitious goals, follow rules and have fun. Gamification is therefore recommended for use in everyday life as it can help overcome boredom, repetition and passivity.

This article describes the use of a gamified approach to improve motivation, engagement and learning. It describes 8 elements of games used to gamify learning - rules, goals and outcomes, feedback and rewards, problem solving, story, player(s), safe environment, sense of mastery. Which and how many game elements should be used to gamify learning is still an open question, but researchers conclude that it is



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

best for a teacher to consider the educational goals and desired outcomes of the learning process when selecting game elements. Other researchers have related game mechanics to the processes involved in the learning experience. They argue that gamification of learning is intrinsically motivating because the rules are inputs to a variety of decision-making processes; it is fun because the goals allow learners to see the direct impact of their efforts; it is authentic because fantasy provides a compelling backdrop that allows learners to experiment with skills without suffering the consequences of real-life failure; it is self-responsible because feedback guides learners to work more easily and correctly; it is experiential because the social element allows learners to share experiences and build bonds.

The literature review shows that experts praise the versatility of gamification, which can be used in lectures, as homework, as a final exam, or as a main learning activity to motivate students, improve their skills, or maximise their learning. It is often emphasised that the judicious, strategic, and appropriate use of game elements can create a learning situation characterised by high levels of active engagement and motivation, leading to positive cognitive, emotional, and social outcomes. However, some scholars also point out the limitations of gamification (that it can trivialise topics, that learning problems cannot be solved by games alone, etc.).

The paper then focuses on gamified learning to explore what happens when gamification is introduced in the classroom (motivation, engagement and student achievement):

- 1) Gamification and motivation: many studies show that game elements can increase the level of intrinsic motivation only if they make boring tasks interesting. If they increase extrinsic motivation, the level of intrinsic motivation drops significantly, leading to less enthusiasm for work. Gamification is not necessarily an important motivational element for everyone, because some students just do not like competing with their peers. The fact that different gamers experience the same benefits differently is also shown by the results of several studies. Gamification focuses too much on extrinsic motivators, so the effects are not the same for all students in a classroom. Researchers believe it is important to use an expanded list of techniques that balance extrinsic and intrinsic motivators, and to design a gamification system that can be adapted to ensure that all students in the classroom can enjoy the benefits of gamification.
- 2) Gamification and engagement: engagement can be defined as the student's attention and receptivity to the task set by the teacher. It depends on several factors: whether the student is intrinsically or extrinsically motivated; engagement is motivated when students have the opportunity to choose between gamification and traditional methods.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

3) Gamification and learning outcomes: Gamification develops problem-solving skills through a complex rule system that encourages active exploration and discovery. The researchers also recognise the value of "concrete challenges that are tailored to the player's skill level and increase in difficulty." Similarly, they acknowledge the importance of the "emotional domain" (i.e., pride, joy, optimism, curiosity, and frustration at failure).

The last part focuses on the research that should be done in the field of gamification. The authors make some suggestions on the aspects that would benefit most from future research.

Research studies give two kinds of warnings: We need to pay attention to the environment and change the design frequently to have a greater effect on motivation. They confirm the need to create gamified environments with clear goals, challenging tasks, and authentic stories where team spirit is fostered through game mechanics, discussion, and debate. In addition, these gamified environments must meet the learning needs of learners, and they also suggest that gamification should add an aspect of enjoyment or novelty. Voluntariness of participation should also be ensured, as research has shown that gamification is more effective when the learner has a choice. Coercion detracts from the essence of the gamified activity and reduces learner motivation. Finally, feedback can increase learner motivation and improve performance. Research studies suggest that gamified learning experiences should include early, frequent, meaningful, and timely feedback.

In order to make progress in the field of gamification studies, the quality of research needs to be improved. In particular, one researcher argues that problems with comparability of data in international studies of gamification can be overcome with both appropriate psychometric measures and appropriate samples.

Research should examine specific elements of gamification rather than an overarching concept; research should consider technological capabilities and their relationship to gamification systems; and the transfer of knowledge from game contexts to non-game contexts should be explored.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

[Sillaots, M. (2016). *Creating the flow: the gamification of higher education courses. Tallinn University.*]

Game-based learning as a teaching method is not in itself an innovation. It is often used in kindergartens and primary schools, but is not so common at university or in adult education. In recent years, the approach of using game elements in a non-game environment (gamification) has become increasingly popular in various fields, including education. In this PhD thesis, authored by Martin Sillaots from Tallinn University, three courses were redesigned using the gamification approach to investigate whether students can experience a "flow" (an optimal experience at the level of mind and body, where the user becomes absorbed in the activity and feels deep pleasure). The author created conceptual models to show how the game elements are connected to each other and to the different flow dimensions; he also evaluated the theoretical flow model. He also evaluated different game elements to find out which ones students thought were most useful and to see if gamification could positively contribute to students' engagement in the learning process and to the lesson design itself. The author found that students like some game elements more than others. Challenges are one of the most important game elements; they can be created with different game elements and contribute greatly to the creation of game elements such as gameplay, interaction, fun, etc. On the other hand, students are not so enthusiastic about avatars which did not contribute to the development of game flow. One of the successful game elements is feedback, which encourages teachers to give feedback to students on a weekly basis. The author also highlights the redefinition of the flow model as one of the most important outcomes of his work. He notes that there are clear connections between the different dimensions of flow: Balance between challenges and skills, clear feedback and goals are prerequisites for flow. Focus and control are the final prerequisites for flow outcomes and evidence. The author concludes that gamification can make a positive contribution to instructional design if the collection of game elements is carefully selected.

**Tanja Brčić Petek - IGRA VLOG KOT METODA IZKUSTVENEGA UČENJA PRI JEZIKOVNEM POUKU SLOVENŠČINE (Role-playing as a Method of Experiential Learning in Slovenian Language Teaching) – Master thesis**

Source: <https://dk.um.si/Dokument.php?id=107410>

Role-playing is a method of experiential learning that allows a student to develop a deep understanding of a subject matter and express creativity. It also promotes the development of various skills: basic mental skills - comparing, classifying, generalising, identifying, reasoning, analysing, researching; critical thinking skills - analysing arguments, testing hypotheses, using language correctly; communication skills - listening,



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

establishing a dialogue, establishing positions, forming opinions. This method allows to achieve a wide range of educational goals in the field of cognitive and emotional development of a person. On the basis of the teacher's instructions and guidelines, students through mental processes independently, imaginatively and creatively present a given situation, conduct a debate, solve difficulties that have arisen and create learning materials. In addition to mental and intellectual processes, emotional and imaginative activities are also activated. Teaching with the method of role-playing and the analysis of the acquired knowledge, the level of creativity, engagement and participation in learning allow us to conclude that by using this teaching/learning method in a secondary school with bacalaureate we can achieve the set educational goals and motivate students to work, thus making our teaching more interesting and attractive. The results of the analysis of the school work, the evaluation as a result of the role play as an introductory motivation, as a method of diversifying the lessons and as a method of acquiring, repeating and consolidating knowledge have shown that the role play is an appropriate and successful teaching/learning method, as the educational objectives were achieved and the students were creative, active and successful.

**Simon Špehar - Aplikacija za gamifikacijo mobilnega učenja (Gamified mobile learning application) – Bachelor thesis**

**Source:** [http://eprints.fri.uni-lj.si/4041/2/Aplikacija\\_za\\_gamifikacijo\\_mobilnega\\_u%C4%8Denja.pdf](http://eprints.fri.uni-lj.si/4041/2/Aplikacija_za_gamifikacijo_mobilnega_u%C4%8Denja.pdf)

Mobile learning is something that most people use today when they use mobile devices, whether intentionally or unintentionally. In the first part of the paper, there are presented the beginnings of mobile learning and what mobile learning actually is, as well as different ways of accessing mobile learning content. Motivation in mobile learning plays an important role, as we want it to remain interesting for users so that they do not stop using it. The latter problem is solved by the so-called gamification. The elements of gamification are further described and it is exemplified how we can integrate such elements into our system. There are also described the features of mobile devices that can be used for an even better user experience in our application. The second part of the paper is dedicated to the development of a mobile learning application that uses elements of gamification. The development process of such a system is presented, as well as the technologies we may use and how the mobile and web application work.

**Keywords:** mobile learning, gamification, mobile application, web application, PHP, Javascript, Laravel, Ionic, REST.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

**Irena Mrak Merhar, Klara Vidmar, Lucija Umek - USING PLAY IN ANDRAGOGICAL PROCESSES**

Source: [https://issuu.com/drustvomladinskiceh/docs/uporaba\\_igre\\_v\\_andragoskih\\_procesih](https://issuu.com/drustvomladinskiceh/docs/uporaba_igre_v_andragoskih_procesih)

The manual introduces different types of plays and classifies them according to the purpose for which the play is used. In addition to the design, implementation, and classification of the play, the manual also addresses group dynamics and their implications for the use of the play in adult learning processes. It presents a play as a dynamic in a group of people aimed at relieving pressure, achieving goals more quickly, or helping to introduce or process a topic. The game is defined as one of the methods used in education, group management, methodical pursuit or discovery of new ideas.

**Irena Mrak Merhar, Lucija Umek, Jana Jemec, Peter Remik – DIDAKTIČNE IGRE IN DRUGE DINAMIČNE METODE (DIDACTIC GAMES AND OTHER DYNAMIC METHODS)**

Source: [https://issuu.com/drustvomladinskiceh/docs/didacticne\\_igre\\_in\\_druge\\_dinamicne](https://issuu.com/drustvomladinskiceh/docs/didacticne_igre_in_druge_dinamicne)

This handbook is devoted to didactic games and other dynamic methods in the classroom. Play is an important mediator of knowledge and one of the most useful dynamic working methods in adult education. Individuals integrate pre-existing knowledge into the game and build upon it with new insights and knowledge gained through play and interaction with fellow players. Play not only provides cognitive insights, but also impacts the affective and psychomotor domains of an individual's development, facilitating holistic learning. The handbook presents static and dynamic working methods, how to choose the right balance between static and dynamic working methods, different didactic games in formal and informal education, and best practice examples.

**MegaVET “Move to Enhance the Gamified Applications in Vocational Education Training” Project (a book about gamification and about the Android application)**

Source: <https://www.sc-nm.si/sestg/megavet/megavet-book.pdf>

Project's website: <http://www.mega-vet.eu/>

At European and national level



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

MegaVET is a book about gamification and about the Android application. It was written by members of the Erasmus+ project "Move to Enhance the Gamified Applications in Vocational Education Training (MEGAVET)". The free book contains chapters that are an offline guide for teachers, based on the Android application and explaining the key facts about gamification. The MegaVET book is not only a guide, but also a turnaround, especially for teachers involved in the educational process. It enables teachers to understand their new role in transforming teaching methods to achieve the desired results. Moreover, we learn how to create effective learning experiences among students through gamification and how to develop challenges to find solutions to various problems.

The Mega-VET web-based online game is an interesting and functional platform which includes 4 different units in the field of electronics, amplifiers, rectifiers, and mechatronics, three and four phase systems. This game available on the website is connected to the Android platform which aims to test the progress and performance of the students under the control of their parents. The main structure of the platform, designed by the Slovenian team, has been enriched and extended by the contributions of the Turkish, Greek, Italian and Slovenian teams.

MegaVet android application: <http://www.mega-vet.eu/game/>

The Mega VET Android is a platform where parents can track the time their children have spent playing the game and how they have performed in the extras, hints and exercises.

### **LEVEL UP! Designing game-based practices for migrant children inclusion**

The "LEVEL UP" project targets immigrant students and aims to promote inclusion and respect within schools by introducing gamification systems in education. This approach, commonly known as gamification, which incorporates game elements such as storytelling, problem solving, rules, collaboration, competition, reward systems, feedback and learning through trial and error in non-game situations, promotes engagement, participation and teamwork in schools.

The results of the project will be elaborated and summarized in an interactive MOOC, <https://www.levelup4inclusion.eu/mooc/>, with pop-up elements translated into English and all languages of the project partners:

module 1: introduction to gamification and main elements (4 units), module 2: focus on game-based learning for children with migrant background or disadvantaged groups ( 2 units), module 3: focus on game-based activities for key transversal key competences (communication and interpersonal, cultural,



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

entrepreneurial, teamwork - learning to learn, active citizenship, etc.) (2 units), module 4: focus on game-based activities related to key curricular skills (language, stem, digital – other subject related) (2 units).

### **GUIDELINES FOR PLANNING, IMPLEMENTING AND ASSESSING GAME-BASED ACTIVITIES**

**Source:** <https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Guidelines-for-planningimplementing-and-assessing-GameBased-activities.pdf>

These guidelines provide support with a basic but comprehensive methodological framework for harmonized testing of experiences in local schools as part of the project LEVEL UP. The document also provides guidance on the different aspects to be taken into account when planning and evaluating the game-based activities carried out, the learning and the impact of the activities/tools on teachers and students. In the first part, a general overview of what game-based education is for inclusion is provided. EU and international literature is drawn upon and the general game-based approach is translated into the specific aim of the LEVELUP! project. The second part constitutes a guide for planning the activities. In the third and fourth part there are provided some basic information on evaluation processes and examples of (non-mandated) tools that can be used during the experiment, including some indicators. This last part also contains the draft final report that each school carrying out activities will present at the end of the school year in order to draw some general lessons at EU level.

### **A COLLECTION OF GAME BASED ACTIVITIES AND GOOD PRACTICE, RELATED TO TRANSVERSAL SKILLS**

**Source:** [https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice\\_M3.pdf](https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice_M3.pdf)

### **A COLLECTION OF GAME BASED ACTIVITIES AND GOOD PRACTICE, SELECTED BY OUR PROJECT PARTNERS, RELATED TO KEY CURRICULAR SKILLS**

**Source:** [https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice\\_M4.pdf](https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice_M4.pdf)

## I.3. Hungarian literature on best practices in game-based learning methods

### **Dóra Lévai - Gamification**



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The article defines gamification as follows: Gamification is an innovative educational method that transforms certain learning processes into games. The method uses game elements in environments that represent situations outside the game to make them more interesting and engaging. One of the main reasons for gamification is that they can receive rewards after completing certain tasks, which can take many forms.

According to the author, the method of gamification allows for flexible learning paths, individualized education, and provides equal opportunity - as not everyone has to complete the same task, but different types of tasks can be used to achieve the score/result required for excellence.

Gamification can also increase equality of opportunity by offering students with special needs a choice of processing methods.

**Source:**

<https://tka.hu/nemzetkozi/6575/jatekositas>

**Zoltán Harangi-Tóth - Game-based education at the university**

At Ludovika - University of Public Service, game-based education is used to help students apply not only critical but also creative thinking among rapidly changing life situations and multiple professional challenges. To develop this, two types of games have been developed:

- so-called "serious games", i.e. platforms that can be used not only for pure entertainment, but also to achieve educational or training goals, but which are also fun and require active student participation.
- Modern Anglo-Saxon War Games.

At the university, these courses were divided into two parts: the presentation of theoretical principles and a game-based part. During the introduction to the theoretical foundations, the students are familiarised with the military historical context and the methodological context.



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Source:

<https://belugyiszemle.hu/hu/node/788>

### **Györgyi Bajka - Gaming in adult education: expectations versus reality**

Based on his experience, the author of the article assumes that it is difficult to train adults, especially if the conditions are not appropriate. This served as a motivation to find out what solutions can be used to arouse and maintain the interest of adults in learning/training. He claims that during play, people behave exactly as they would expect or be effective during training: They are focused, concentrated, having fun, and willing to step out of their comfort zone. This is why so-called gamification began, using play as an educational method.

In this article, the author shares his experience with gamification: 3 typical obstacles to consider when gamifying:

1. Adults often view education as a serious activity to which they devote time and attention. Therefore, anything that does not look serious enough can be suspicious for them, their interest and motivation will decrease even more, and the authority of the teacher will diminish.

Therefore, the author suggests that the instructor use tools such as timely nods, detailed feedback, and the use of achievable goals.

2. Too much fun can lead to frustration. Therefore, it is important to remember that using a game that is too complicated can defeat the very message of the training. The author suggests that the trainer ensure that the rules are as clear as possible. He also suggests that more complex elements should only be introduced once the players have already progressed in the game. Also, make sure that you explain the purpose and expected outcome of the game to the participants before explaining the rules. Players need to understand the benefits of the game before they can digest the rules.



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3. Chances are, players will only be exposed to a particular game for a short period of time and only once. Most games are designed to be played many times (or players spend many hours learning them), and a game played for the first time often does not provide the player with an optimal experience. Therefore, the instructor must ensure that the first playing experience is enjoyable and positive.

**Source:**

<https://epale.ec.europa.eu/en/blog/gamification-adult-learning-expectations-vs-reality>

#### **Bónus Lilla - Nagy Lászlóné: Development of research skills with the game method**

Based on a pedagogical approach, three generations of educational games can be distinguished:

1. The first generation is edutainment - entertaining teaching: this includes serious games, gamification, game-based learning, digital game-based learning.
2. The second generation includes games that use cognitive and constructivist approaches to engage students in the games.
3. The third generation includes games that focus on students' interest in computer games.

Based on the research, game-based learning and digital game-based learning are the most relevant approaches in education. Game-based learning helps in the acquisition of knowledge and skills when the game activities provide problem-solving opportunities and challenges that give learners a sense of accomplishment. Ideal games start with simple tasks and then become more difficult.

**Source:**

[http://publicatio.bibl.u-szeged.hu/21211/1/MS-9402\\_MTA\\_biologia\\_07.pdf](http://publicatio.bibl.u-szeged.hu/21211/1/MS-9402_MTA_biologia_07.pdf)

#### **Gáborné Németh - Andrea Doktor: Possibilities for the development of social competence in school**



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

In spring 2002, the Council of Europe identified eight key competences: mother tongue communication, foreign language communication, mathematical, scientific and technological competences, skills related to the use of information and communication technologies, learning competences, interpersonal and civic competences, skills and abilities related to entrepreneurship and cultural awareness. The National Core Curriculum supports the development of social skills such as communication, decision making, highlighting, life management, collaboration, problem solving and critical thinking.

The school and the educational environment play a key role in the development of social skills. To develop this competence, the author has developed several game-based programs as follows:

- Group organizer game with animal names
- Cooperative pun game,
- Message without words,
- Reflection,
- Who is the initiator?

The purpose of these exercises is to practice nonverbal communication.

- Descriptive Game: Aims to develop communication skills.
- Linzer game, Common montage, Common features – common story, Fairy tale, Dream and paths: aimed at developing creativity, experiencing the effectiveness and joy of joint activity, practicing cooperation.

**Source:**

<https://folyoiratok.oh.gov.hu/uj-pedagogiai-szemle/a-szocialis-kompetencia-fejlesztesenek-lehetosegei-az-iskolaban>

**Attila Zoltán Kenyeres: Development of communication competence**



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

The article describes that communication is more than a simple cognitive ability, precisely because the study of various life situations shows that almost no human activity can take place without some form of communication. It argues that communication competence is a set of components that perform the function of appropriate behavior in a social situation. This is because communication expresses the whole personality and is therefore a complex competence based on cognitive, social, personal and special skills. It follows that the development of this competence is important. The article identifies 3 main areas in the development of communication skills:

- general communication
- verbal communication
- written communication

A further subdivision is the development of native communication, which includes the expression and interpretation of concepts, thoughts, feelings, facts and opinions, both orally and in writing (such as understanding the text heard and read, composing the text). It also includes the correct and creative use of language in social and cultural activities, education, family life, work and leisure activities.

Communication competencies can be developed effectively through both individual and group tasks. What they have in common is that experiential learning is the basis for developing communication competence. The advantage of experiential learning is that it ensures the natural development of the participants' motivation and provides practice in the skills acquired.

Someone guesses a term and describes some characteristic information about it. For example: "This is me", "My value depends on it" and so on, described in the first person. Then these descriptions are read out loud and the person who guesses first, that is, based on less information, gets more points. You only get one guess and whoever does not match is eliminated. It is a good idea to arrange the information so that the term becomes more and more defined. All this promotes the ability to manage information (data systematization, data management). This includes, for example, the "taboo" game, where you have to explain a concept without being able to pronounce certain words in the meantime. The first person to pronounce the concept you are looking for gets the point. It develops information management skills (systematizing data, creating information), oral text composition, and text comprehension.

Group tasks also include games where the aim is to develop the learner's exploratory, experimental and heuristic attitude. The tasks allow students to discover the rules for themselves and to apply and use them



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in recent practical situations. These exercises focus on pair and group work, where students can try out different communication roles (speaker, reviewer, arguer, etc.).

Games are of particular importance in skill-building exercises, the author admits. This is because playing and games are an integral part of human life, e.g. dancing or other movement games can also be counted among them. Gadamer sees it as a game that has a purpose for itself, they participate in it for the activity itself. Accordingly, participation in play is a desirable and self-motivating activity. This characteristic can also be used in skill development and games can be assigned to a wide variety of content. Players then disengage, open up during games, can more easily engage with themselves and their own shortcomings, and try themselves out in situations that allow for experiential learning.

Source: [http://www.biharinepfoiskola.hu/kompetencia\\_eu/page.php?30](http://www.biharinepfoiskola.hu/kompetencia_eu/page.php?30)

**[Nagy, S. és Molnárné, C. K. (2019) „A játékosítás (gamification) mint a digitális oktatási innováció egyik eszköze - A SimBrand szoftver esete”]**

Based on international best practices, the authors of the study analyzed how a marketing simulation game - called SimBrand - could affect students' attitudes toward studying marketing.

The authors argue that increasing student satisfaction is an important task in higher education. One way to do this is to create courses that engage students and provide them with an engaging experience.

Based on their empirical research, it is possible to conclude that, apart from its obvious limitations, the use of games in higher education courses is clearly to be recommended as it is a methodology better suited to real-life challenges than theoretical frameworks. It works particularly well in cases where we want to understand and practice online collaboration, team decision-making, decision analysis, and the holistic workings of marketing with students.

Source: Nagy, S. és Molnárné, C. K. (2019) „A játékosítás (gamification) mint a digitális oktatási innováció egyik eszköze - A SimBrand szoftver esete”, *Marketing & Menedzsment*, 53(2), o. 55–68. doi: 10.15170/MM.2019.53.02.05.

**[Balogh, A. (2017) - Digitális játékok az oktatásban]**



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

The relationship between games and teaching has a long tradition. In today's digital world, it is not surprising if a computer game builds its gameplay on the universal (sometimes lexical) knowledge that students can later use in school. Apart from the negative opinions about video games (such as the risk of addiction), it can be noted that games and teaching are becoming more and more directly linked. This phenomenon is the so-called digital game-based learning. The author's study first provides an overview of the importance of games for language socialization. It then introduces the use of edutainment games, the increasingly popular digital games, in the classroom, based on the principles of gamification. As a mind-building approach, gamification can facilitate teaching and learning through the use of mechanical devices outside of games.

**Source:** Balogh, Andrea. (2017). Digital games in education. 10. DOI: 10.21030/anyp.2017.1.5.s

**[Duchon, J. (2021): Tanulási stílus és játékos típus összevetése felnőtteknél, az oktatási folyamat játékosítása céljából]**

Duchon's study assumes that each person has a learning style that determines how the person learns new knowledge. However, each person is motivated by different things within a game. In early 2021, a questionnaire-based survey was created. This survey used both a simplified version of Kolb's learning style questionnaire by Peter Huney and Alan Mumford, and Richard Bartle's player type test. The questionnaire aimed to measure whether there was a relationship between learning styles and the different player types. The study found a significant relationship between the categories of learning styles and the different player types, so the results benefit the gamification of the learning process. Overall, in addition to competencies at the individual level, whether openness to digital transformation at the level of those working in the business sector is critical. If so, what is the pace of effort and response time to adopt digital trends? In your view, accounting education will not be a victim of digitalisation, but a winner if there is a timely response to the change.

**Source:** Duchon, Jenő (2021). Comparison of learning style and play type in adults to play the educational process. In: "Talent, Diligence, Profession": Study Volume. Hungarian Law Enforcement Association Customs and Finance Department, Budapest, pp. 223-235. ISBN 978-615-81879-0-9



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

**[EPALE (2020): „How much gaming does education need?“ – Interview: a game designer’s perspective on gamification in (adult) education]**

Prof. Michael Baur, a senior game designer, explains that many different needs can be satisfied by playing a game. Based on the lines of Marc LeBlanc's "8 Types of Fun," they are:

Sensation: Sensory pleasure, most of all the audiovisuals.

Fantasy: Escape into virtual reality (away from everyday life)

Narrative: The need to experience and live through new narratives and stories.

Discovery: Discovering something new, seeking out secret places.

Challenge: Setting oneself a new challenge and competing with others.

Fellowship: Experiencing something shared, or exchanging something with other players.

Expression: Living something out, expressing something, or creating something new through the game.

Submission: Simply resting and relaxing from the stresses of everyday life through the repetition of simple game mechanics.

According to Prof. Baur, there are several approaches where game design and learning can come together, "One approach is tangential learning. A good example of this is the movie "300". The film is not about teaching the players or viewers anything specific, but rather the viewer is content to become so attentive and curious about a historical event that he or she later researches it independently. The movie "300" is about the battle of the Spartans against the Persians at Thermopylae in 480 BC.

Among video games, Ubisoft's "Assassin's Creed" series is a good example. In the third instalment of this series, the time in the game is the period of the American Revolution and the resulting American War of Independence between 1753 and 1783. Throughout the story, the players encounter numerous historical figures such as George Washington, Benjamin Franklin and Thomas Jefferson. By their own admission, many American gamers learn more from the game's historically reconstructed scenes than they did in history class at school. In the sequel, Assassin's Creed Origins, you can experience several virtual tours of ancient Egypt in addition to the game itself. Here you have the opportunity to visit and explore the major landmarks of ancient Egypt and collect historical artefacts.



Erasmus+ KA2, ***GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

Otherwise, to achieve a higher level of learning in a game, you could turn to serious games. These are applications that primarily aim to convey a message and only secondarily serve to entertain. With this genre, there are various ways to integrate information, messages and learning content into a game. These are:

- the direct transfer of knowledge acquired in the game (no additional didactic approach)
- a didactic approach through embedding the game in a learning situation.
- a didactic approach through embedding the learning tasks in a game.

EPALE (2020): „How much gaming does education need?” – Interview: a game designer’s perspective on gamification in (adult) education. URL: <https://epale.ec.europa.eu/en/blog/wieviel-game-braucht-education>

**[Árvai-Homolya, Sz., Lengyelne Szilágyi Sz., Osváth A. (2018): *Játszva tanulás innovatív, LEGO alapú logikai készségfejlesztő foglalkozások keretében (Learning by playing based on innovative, logical skills developing lesson using lego)***

In childhood it is very important to learn through experience and discovery, this is the so-called "lifelong kindergarten". According to the authors, empirical knowledge is more easily consolidated. Students arrive at writing down word problems and formulating answers on their own. Age-appropriate commonalities are that primary school children need games, so we have developed innovative, beneficial classes for them using LEGO®. The different themes set them increasingly complex tasks while they "just" play. While playing, they learn to work in pairs as well as in groups, to formulate their opinions, to argue, to evaluate and, last but not least, they have to plan work sequences. A positive aspect of this method is that the children have the feeling that they are continuously achieving something. In this way, they can acquire a solid mathematical knowledge while playing, which they can rely on in further education.

Árvai-Homolya, Szilvia és Lengyelne Szilágyi, Szilvia és Osváth, Andrea (2018). *Játszva tanulás innovatív, LEGO alapú logikai készségfejlesztő foglalkozások keretében = Learning by playing based on innovative, logical skills developing lesson using lego*. GRADUS, 5 (2). pp. 264-269. ISSN 2064-8014



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

#### I.4. Romanian literature on best practices in game-based learning methods

**1. Dumitrescu, V.; Covaci, M.; Popescu, A. (2009). *Laboratorul de educație nonformală ; Culegere de metode și instrumente [Laboratory of nonformal education ; Methods and tools]*. București : Agenția Națională pentru Programe Comunitare In Domeniul Educației și Formării Profesionale.** Available at <https://learningforchange.net/ro/knowledge-base/culegere-de-metode-si-instrumente-non-formale/>. Retrieved, October 10th, 2021.

A book of many non-formal methods and activities tested and applied in the laboratory of non-formal education in Gura Portiței, Tulcea County, Romania, from 6 to 12 July 2009. The material was developed by the National Agency for Community Programs in Vocational Education. The methods presented include: Games, Walt Disney Method, Transcend Method, Labyrinth Theater, Open Space, etc. The book also provides guidance on how these methods can be used in non-formal education. The book emphasizes the role of non-formal education as an important component of lifelong learning and the essential impact of experimental, laboratory-like experiences on the personal and professional development of young people, as such methods are a vehicle for change and transformation at the individual level.

**2. Neagu, M. (coord.). (2010). *Curriculum Teatru Forum. Ateliere practice pentru dezvoltarea abilităților de viață la tinerii ce aparțin unor grupuri dezavantajate [Curriculum Forum Theatre. Workshops for building life skills at vulnerable youth]*. București: Asociația A.R.T Fusion.** Available at [https://artfusion.ro/wp-content/uploads/2020/12/Curriculum-TF\\_ART.pdf](https://artfusion.ro/wp-content/uploads/2020/12/Curriculum-TF_ART.pdf) . Retrieved, October 10th, 2021.

A.R.T. Fusion and the National Institute of Corrections have been working on the project from.

February - November 2010, the project EXIT II being aimed at providing non-formal education opportunities to young people in prisons in order to develop the life skills necessary for their reintegration into society. The project targeted young people in re-education centers, but also youth workers involved in activities for young people with special needs. The reasons why a young person ends up in detention prevent them from developing the life skills necessary to integrate harmoniously into society throughout their lives. Therefore, this project aimed to compensate and make up for this lack of life skills by giving young people in the target group the opportunity to integrate into society. EXIT II is a project that took place at national level and involved a number of 6 re-education centers of the National Administration of



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Penitentiary Institutions from Craiova, Tichilești, Tg.Ocna, Buziaș, Găești and Târgu Mureș. The objectives of the project were:

- To develop the competences of the A.R.T Fusion Association in order to provide long-term non-formal education services within the framework of Forum Theater (social tool of community intervention);
- The project trained 24 community educators and re-education center staff in the delivery and coordination of non-formal activities related to Forum Theater (Theater of the Oppressed);
- Development of life skills of 120 young people in 6 juvenile detention centers and re-education centers in Romania. 120 young people from re-education centers were trained in the development of skills such as: teamwork, critical thinking, creativity, adaptability, communication, using the method of Theater of the Oppressed. During the project period, 12 forum theater performances were held in action communities;
- Dissemination of good practices in participatory arts among 100 organizations and institutions working at national level with disadvantaged young people - especially those deprived of their freedom;

A.R.T. Fusion disseminates the results of this project through the Good Practice Guide for the Forum Theater Method, the Curriculum Theater Forum and the project presentation film.

This project has been supported by the Romanian Government, the Ministry of Public Finance, the Paying Agency and Phare Contracting through financial support from the Transition Facility Project 2007 / 19343.03.03 - Integration into society of young people belonging to minorities and disadvantaged groups, European Commission Project Number AB 33.

Curriculum Theater Forum is a planned educational experience that aims to develop the skills of children and young people by using Theater Forum as a basic methodology and as a means of social intervention. Curriculum Theater Forum aims to: provide a learning experience for a large group of young people that is flexible and structured for easy use; meet the goals and mission of A.R.T. Fusion and Project E.X.I.T II; to use the most appropriate resources to meet the needs of the beneficiaries; to take into account the age characteristics of the final beneficiaries (young people from re-education centers); to be based on what the young people should know, do and be (knowledge, skills, attitudes); to be based on the skills the young people acquire rather than how much they are taught; to show what the young people have learned.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Each meeting is structured so that you can choose from the suggested activities the methods you think are most appropriate for the group of young people you are working with. You will take into account the following: the age of the participants, the expected learning objectives, the preferences of the participants, the style of facilitators and jokers, the order of the activities, the room in which the activities are to take place, the materials needed, etc. To facilitate the reading of the curriculum, you can view its tabular structure at the beginning of each component. The table structure includes: the week in which the workshop could take place; the name of the workshop; the learning objectives for each workshop, divided into: Knowledge, Skills and Attitudes. All the activities described are game-based.

**3. Damian, A.; Gavriloiu, A.; Stinga, C.; Misu, P. (2007). Ghidul animatorului socio-educativ. [A Guide for socio-educational entertainers]. București: Asociația CREATIV.** Available at <https://bibinfdoc.files.wordpress.com/2013/12/ghidul-animatorului-socioactiv.pdf>. Retrieved, October 10th, 2021.

This guide was produced as part of the "RESPONSIBLE - TRAINING COURSE IN SOCIO-EDUCATIONAL ANIMATION FOR YOUNG VOLUNTEERS" project and is intended to be a useful tool for volunteers as well as for specialists and professionals carrying out animation activities.

The project took place between September and November 2007 and aimed to train 20 volunteers from different non-governmental organizations to become socio-educational animators. The design and drafting of the material that makes up this "Guide for animators" was supported by the educators involved in the project and aims to provide the necessary basic information for animators, such as methodological aspects of organizing activities, types of structured games according to specific criteria, i.e. games according to objectives, games or activities organized outdoors, games according to age categories, games or activities according to the type of dynamics necessary for development, etc.

This guide is a useful tool for animators and, at the same time, one of the ways to provide them with minimum quality standards for non-formal education activities. The guide can also be a source of inspiration and a starting point to discover or even invent new games and activities that meet the needs of the beneficiaries. The guide for animators is structured in such a way that it starts from play as a means of education. In this context, a series of studies, ideas, thoughts and texts on the importance of play are presented. After this introduction, the elements that make up the profession of socio-educational animator are presented briefly and in an original way: the methodology, the competences of the animator, the pedagogical project, the relationship between beneficiary-needy-socio-educational



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

animator. As for the methodology, this book deals with aspects related to the types of activities, games and play. The most consistent part of this book is the presentation of the different types of games, their classification, followed by examples of games from some of the categories presented.

**4. Organizația Națională Cercetașii României. (2013). Manualul 100 de idei de educație nonformală [Handbook of 100 ideas of non-formal education]. București.** Available at <https://www.scout.ro/wp-content/uploads/2013/10/Manual-100-de-idei-de-educatie-non-formala.pdf> . Retrieved, October 10th, 2021.

"100 Ideas for Non-Formal Education" is the largest project carried out by the organization National Scouts of Romania, both in terms of activities and material and human resources used. The lack of alternatives for education and leisure activities for children and young people, based on the weak participation of Romanian citizens in voluntary and community projects, has been identified as a problem. One of the project objectives was to develop non-formal education tools adapted to the current needs of children and young people in Romania and disseminate them in 50 branches and subsidiaries of the organization and in at least 100 non-governmental youth organizations. The non-formal education tools aim to provide social, civic and life skills and abilities. The project aimed to train both volunteers and educators to work with non-formal game-based educational activities to build life skills in children and youth. The book "100 Ideas for Non-Formal Education" is available not only for the national organization "Scouts of Romania", but also for all organizations providing non-formal education. The project was funded by the European Economic Area (EEA) funding mechanism.

**5. Gadoularov, O.; Romanică, B. (2006). Manual. Formarea formatorilor. Folosirea educației non-formale și a metodelor interactive în lucrul cu tinerii [Handbook. Training of Trainers. Using Non-Formal Learning and Interactive Methods in Youth Work]. Educație non-formală pentru angajabilitate/Non-formal learning for employability. Project: 2014-1-BG01-KA205-001743.** Available at <https://educativpgm.files.wordpress.com/2013/02/manual-tot-ro-online.pdf> . Also, English version [https://www.salto-youth.net/downloads/toolbox\\_tool\\_download-file-1493/Manual%20TOT%20EN%20Online.pdf](https://www.salto-youth.net/downloads/toolbox_tool_download-file-1493/Manual%20TOT%20EN%20Online.pdf) . Retrieved, October 10th, 2021.

This handbook contains a vast amount of information based on the authors' many years of experience in the field of non-formal learning (NFL) and interactive teaching of children, young people and adults. A great deal of information on the subject from various sources - studies, reports and scientific publications



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- has been used in the preparation of the handbook. By combining practical experiences of the author team with theoretical concepts, this handbook was created to bring together a large number of topics, many of which are often not addressed in the NFL and youth field. This handbook is one of the tools used to increase the impact of the NFL in preparing young people for their social and professional development, as well as a tool to increase the importance and quality of youth work. The production of the handbook "Training of Trainers - Using NFL and Interactive Methods in Youth Work" is a training product that addresses one of the gaps in the youth sector, namely the need for methods to train trainers who are able to train youth workers.

The book is divided into three parts: general concepts, theoretical framework and practical skills. One of the main objectives of this handbook is to enrich non-formal learning and trainers' understanding of how to apply modern training approaches to improve learning outcomes. Through this handbook, the authors attempt to take knowledge of the learning process beyond the simple classification of training tools (or games) to the level of concepts and processes. The authors aim to support the creation of training programmes based on the achievement of measurable learning outcomes, while supporting and addressing individual specificities and learning needs, also emphasising the importance of group processes, emotional state and specific environment for training effectiveness. The book discusses concepts such as multiple intelligences, socio-cognitive learning, learning styles, developmental stages, self-efficacy, and others, as well as presenting a series of activities that demonstrate how theory can be applied in practise.

## 1.5. Conclusions

The literature search led to the collection and presentation of a relevant number of papers on good practice in game-based methods in adult education in English, Hungarian, Slovenian and Romanian, some of which are available online with full texts.

The literature review revealed that the researchers working in the field of education with a focus on game-based learning, in the Game-ED project, already have experience that allows them to build their current research on previous work.

The literature review also revealed the need for an authentic, updated collection of best practices in the field of game-based learning, making the activities of the Game- ED project and the intellectual outputs highly relevant, useful and timely.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

## II. Best practices in game-based learning methods in adult education

### II.1. Introduction

This collection of best practices in game-based learning methods in adult education was developed by members of the Game-ED project partners' teams. The collection is one of the final outcomes of research conducted by the project partners, which included a literature review focused on identifying the state of the art of game-based learning methods used to build 21st century competencies in adult learners. The needs analysis conducted as part of the initial intellectual output revealed that adult educators have a need for up-to-date, innovative, interesting, and attractive training and instructional materials to help them build 21st century competencies. The needs analysis revealed that adult learners need flexible, adaptable training that is available both in-person and online and is based on new, innovative, and attractive instructional materials that motivate and stimulate them to continuously engage in lifelong learning, which is the basic requirement for personal and professional development.

Based on the research conducted in the initial phase of the project and the results of the literature review, the project partners have selected a set of best practices for game-based learning methods that can be used to build competences for the 21st century.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

## II.2. Collection of best practices in game-based learning methods in adult education used to build creativity skills

### II.2.1. Gamification in the study of mathematics for engineering students

#### 1. Conceptual delineations

Gamification is an emerging approach to teaching that facilitates learning and promotes motivation through the use of game elements, mechanisms, and playful thinking. The escape room metaphor was used as a gamification element in a mathematics course for engineering students to motivate them and improve the efficiency of formative assessment in their collaborative learning process.

This approach was developed and tested at the University of Ljubljana, Faculty of Civil Engineering.

The results of were first presented in the THE 20th SEFI Special Interest Group in Mathematics conference which was held in June 2021 at the University of Agder, Kristiansand, Norway and published in *Škapin-Rugelj, M., Rugelj, J. (2021), Gamification in the study of mathematics for engineering students. In: Proceedings. Brussels: European Society for Engineering Education (SEFI), pp. 57-62. ISBN 978-2-87352-022-9.*

#### 2. Competence - key competences to which application of good practice contributes

- Mathematical competence and competence in science, technology and engineering
- Personal, social and learning to learn competence
- Digital competence



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

### **3. Description, application**

The presented didactic approach is implemented as a blended learning activity that encourages students to learn regularly and improve the efficiency of their learning. Gamification elements were introduced into the learning process to motivate students to learn together and ongoing formative assessment was integrated into the escape room.

Escape rooms are live action games where a group of players are trapped in a room and must collect clues and solve puzzles to escape. In the Moodle learning environment, the escape room was integrated as a quiz in a classroom activity where students had to solve certain tasks and select the correct answer to escape. It is used as an on-site collaborative activity where students are organized in small groups.

### **4. Advantages and limitations**

A motivated student is more willing to face a task, more focused on solving the task and more persistent in overcoming difficulties. A motivated student is also willing to sacrifice more time and effort to achieve learning goals.

The use of gamification elements usually increases the time required to complete learning tasks.

### **5. An example/illustration of how it can be applied in adult education**

Gamification is an emerging approach to teaching that facilitates learning and promotes motivation through the use of game elements, mechanics, and game-based thinking. It can be implemented at any academic level from preschool to lifelong learning and helps to achieve learning goals at different taxonomic levels, from simple memorization and recall to high-level goals such as assessment or creativity. The use of play can be intrinsic or supplemental, face-to-face with physical objects or played online, with a computer.

### **6. Conclusions**

The results of the evaluation showed that students responded well to the use of gamification for formative assessment in a blended learning environment, that they were more motivated to learn, and that they achieved better results in on-site collaborative learning.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## I.2.2. Mobile serious game for enhancing user experience in a museum

### 1. Conceptual delineations

Mobile technology offers new opportunities to enhance the visitor experience in a museum. Mobile serious games can help create a social context and put visitors at the heart of the experience, allowing them to interact better and engage more deeply with the museum's exhibits.

A multidisciplinary team of researchers and students from 3 faculties at the University of Ljubljana developed and tested a mobile game *Where is the postilion's post horn?* for the Museum of Post and Telecommunications in Polhov Gradec, Slovenia.

The results of the project were recently submitted for publication:

*Stanković Elesini, U., Hlede, M., Kristan, D., Korošec, A., Vrabič Brodnjak, U., Rugelj, J. (2021) Mobile game for enhancing visitors' experience in a museum (submitted for publication)*

### 2. Competence - key competences to which application of good practice contributes

- Personal, social and learning to learn competence
- Mathematical competence and competence in science, technology and engineering
- Digital competence

### 3. Description, application

Museums today are more than just custodians of the past. They act as teachers and are guardians of the future. Museums have transformed from traditional museums to socially engaged museums. More than the aesthetics and visual appearance of museum objects, their stories and social context have become valuable, and through them museums have begun to communicate with their visitors. Historical objects, events and people are brought to life as visitors have evolved from passive spectators to co-creators of museum content. Museum visits have evolved into experiential, informal learning with authentic historical objects in an authentic museum environment.

Among the many mobile applications, games are the most popular category, while gamification introduced in museums creates a more interactive, engaging and informative museum experience.



*Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

#### **4. Advantages and limitations**

Gamification can create an immersive experience that is more interactive, visual, and engaging. Examples of gamification in museums include location-based games, gamified tour guides, quests, challenges, storytelling, and treasure hunts. There are also other positive outcomes of gamification, such as promoting extrinsic and intrinsic motivation, increasing engagement and enjoyment, increasing user activity, knowledge, effective learning, and changing user attitudes.

The mobile game was produced only for the Android platform, so visitors with a mobile phone on the iOS platform cannot play the game.

#### **5. An example/illustration of how it can be applied in adult education**

Gamification in museums as described can be used with appropriate adaptations for any age group. It can help achieve learning goals at different taxonomic levels, from simple memorization and recall to high-level goals such as assessment or creativity, and is particularly suitable for lifelong non-formal learning.

#### **6. Conclusions**

The mobile game developed in this project has all the elements of a serious game. It is educational, with learning objectives from lower to higher taxonomic levels. With a story that connects different eras to the present, visitors get a good overview of the development of postal services and telecommunications. With a simple visual look, characters whose insights and inventions are deeply embedded in modern technology, and fifteen different challenges at different levels, this mobile game has become an important asset for increasing visitors' learning and experience at the museum.

The evaluation results show that during the guided tour with a mobile game, the introduction of various stimulating elements of the mobile game, which are also associated with multisensory experiences, enhance visitors' memory and motivate visitors to actively participate in personal, direct experience with the museum environment and exhibits.



Erasmus+ KA2, ***GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

### II.2.3. Coding4Girls Learning Scenarios

#### 1. Conceptual delineations

As part of the Erasmus+ project Coding4Girls, which ran from 2018 to 2020, we developed a series of learning scenarios to get primary school girls excited about computing or programming by creating games using the Snap! programming language. The 7 countries that participated in the project are Greece (University of Thessaly), Italy (EU Track), Portugal (Virtual Campus), Turkey (Governor of Istanbul,

Ministry of European Union and Foreign Affairs), Bulgaria (Southwest University "Neofit Rilski"), Croatia (University of Rijeka) and Slovenia (University of Ljubljana). The learning scenarios were tested with primary and secondary school students in winter/summer schools and courses in the participating countries and promoted on the project website, [project website](#), social media, [YouTube channel](#), and at numerous [international conferences and other events](#) during the course of the project.

References:

- *Daniela Tuparova, Boyana Garkova, Joze Rugelj, Mateja Bevcic, Spela Cerar, Tadeja Nemanic, Matej Zapushek, Michela Tramonti, Alden Meirzhanovich Dochshanov, Carlos V. Carvalho, Rita Durão, Ivanichka Nestorova, Rositsa Georgieva, Hariklia Tsalapata, Olivier Heidmann, Kostas Katsimentes, Christina, Taka Roxani, Sotiri Evangelou, Nadia Vlachoutsou, Nataša Hoić-Božić, Martina Holenko Dlab, Ivona Franković, Marina Ivašić Kos, , Luigi Tramonti, , Ahu Şimşek, Kadir Fatih Mutlu, Abdurrahman Saygın, USER GUIDE ON THE CODING4GIRLS SERIOUS GAME.*

#### 2. Competence - key competences to which application of good practice contributes

- Multilingual competence,
- Mathematical competence and competence in science, technology and engineering,
- Digital competence,
- Personal, social and learning to learn competence,
- Cultural awareness and expression competence.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

Educational objectives of the Coding4Girls approach, i.e. learning to code by designing games, are:

- *Goal 1: To prepare young learners to enter computer science careers by building programming skills;*
- *Goal 2: To enable learners to apply the newly developed programming knowledge in wider learning contexts;*
- *Goal 3: To build transversal competencies related to programming, such as analytical and critical thinking;*
- *Goal 4: To foster positive attitudes towards computer science among girls and boys with the objective of promoting the uptake of related educational and career paths;*
- *Goal 5: To raise awareness on the links between ICT and the real-world through learning scenarios that demonstrate how ICT solutions can enhance quality of life and address common needs;*
- *Goal 6: To empower learners to think entrepreneurially for introducing solutions to real-world problems through design thinking mindsets.*

**3. Description, application**



Learning Scenario 4 - Character's summer vacation	
<b>Learning Scenario Title</b>	Character's summer vacation
<b>Prerequisite</b>	No prior programming knowledge is required
<b>Prerequisite Experience</b>	
<b>Learning Outcomes</b>	<p>General learning outcomes:</p> <ul style="list-style-type: none"> <li>• write basic object movement,</li> <li>• single or multiple color setting,</li> <li>• Boolean color mappings to logical expressions,</li> <li>• defining, differentiating, dynamically changing and responding to different game states,</li> </ul> <p>Specific learning outcomes oriented on algorithmic thinking:</p> <ul style="list-style-type: none"> <li>• student implements object movement with color from using mouse and keyboard about directions,</li> <li>• student uses a setting color block to get the brother value for right or middle color changing mapping,</li> <li>• student makes object state can be represented with the color of the object's bounding,</li> <li>• student differentiates between two blocks that shift different states and knows how to express them with logical expressions,</li> <li>• student makes the position of the object is dynamically changing and can know how to represent them the current state,</li> <li>• student uses if sentence to give different responses based on the current position of the object</li> </ul>
<b>Aim, Tasks and Skills</b>	<p>Short description: Program simple game in which the object will change its position based on the color of the background.</p> <p>Tasks: Students have to program character to change his body (continued) and also tell where he is in four different situations (2) when returning to the sea, he has to change his color to blue and say "I am swimming in the sea". (3) when he is between the sea and the beach he skin turns half blue-half sandy color and he says "I am</p>
<b>Description of Activities</b>	

Learning Scenario 4 - Character's summer vacation	
<b>Step 1</b>	They have to draw a character and point to skin to four different combinations representing to position in the scene:
<b>Step 2</b>	<p>First they have to make their character move in four directions and back. They can choose their own the combination (e.g. blue-bird or black). As this game we assume that they know how to do it from some other activity. We have to warn the students not to forget that the character can move out of the scene if we don't use appropriate logic when programming movement (boundaries if an edge block).</p> <p>To make character movement a little more realistic, we want him to be able to go left or right from the horizontal direction we are being using a point or direction block.</p>
<b>Step 3</b>	<p>We will introduce students to the concept of character sensing the color. We will introduce students to the concept of character sensing the color (continued) and also tell where he is in four different situations (2) when returning to the sea, he has to change his color to blue and say "I am swimming in the sea". (3) when he is between the sea and the beach he skin turns half blue-half sandy color and he says "I am</p>



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

The teacher has 22 different [learning scenarios](#) to use in the lesson. In each scenario, the teacher has an example of a full code created in Snap and a semi-finished scenario for students to solve. In addition, each scenario includes general and specific learning outcomes, objectives, tasks, and a brief description of the activity, information on duration, learning and teaching strategy and methods, teaching styles, a summary of the lesson, and other tools and resources for the teacher and students (e.g., instructions for students to help them work independently and additional tasks for advanced students). The teacher can modify or adapt the activities as desired, the lesson can be guided or solved by students individually or in pairs, and students can also design their own solution. Both the learning scenarios and the programming language are available in all 7 languages of the participating partners and in English.

#### **4. Advantages and limitations**

Advantages:

- is motivating because students learn computational and creative thinking in an engaging way through playing and creating games.
- Students develop programming skills such as abstract thinking, logical reasoning, problem solving, mathematical skills, learning concepts and applying them to other problems, communication skills, compiling and debugging code, breaking the problem into smaller parts, etc.

Also, prepared learning scenarios/materials:

- Provide teachers with the information they need to enhance their programming instruction through the proposed serious games approach and design thinking learning methods.
- Help build teachers' skills, confidence and motivation to use new ICTs and in particular serious games as a complementary learning tool..
- Enhance teachers' skills to integrate ICT in the classroom through supportive content.

Limitations:

- Games are too simple (but can be upgraded)

#### **5. An example/illustration of how it can be applied in adult education**



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Although the learning scenarios are designed for primary and secondary school students and are primarily intended to encourage girls to learn programming, they can also be used to teach adults. Indeed, the learning scenarios are an excellent opportunity to acquire the above mentioned skills, which are useful in all educational domains, not only programming, as learners learn to think logically and creatively, to break a problem into smaller parts, to find and fix errors, etc.

## **6. Conclusions**

Learning programming or the skills you gain from learning programming are becoming increasingly important, not only in the job market but in all fields. Learning scenarios based on the Coding4Girls approach to learning programming by designing games are a good tool to develop competences that will be very useful in life. The initial results show that the approach was well received by the learners. They have had fun and learned a lot while designing games, and teachers have the freedom to implement and extend the activities as they wish or let the learners use their imagination.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

#### II.2.4. Planet Hexagon

##### 1. Conceptual delineations

Planet Hexagon is a board game developed within the Erasmus+ project Gamestorming for Innovative Teaching (Game-IT). The project, which ran from 2017 to 2020, involved experts from four European countries: Poland (Philological School of Higher Education in Wroclaw - WSF), Romania ("Vasile Alecsandri" University of Bacau - UVAB), Norway (Western Norway University of Applied Sciences - HVL) and Slovenia (University of Ljubljana - UL). During the project, the game was tested by a large number of students from each country - first in their own country, and then at a summer school in Wroclaw, where the game was tested internationally. The game was promoted on the [project's website](#), social media and at the project's conference.



##### 2. Competence - key competences to which application of good practice contributes

- Multilingual competences,
- Mathematical competence and competence in science, technology and engineering,
- Cultural awareness and expression competence.



Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023

The learning outcomes that students achieve by playing the game are:

- *Goal 1: Raising intercultural awareness and tolerance for differences: understanding other cultures, working in intercultural teams, representing different civilizations in the game, various points of view, observation, empathy;*
- *Goal 2: Making players sensitive to intercultural issues and stressing advantages of balanced development and cooperation between various cultures;*
- *Goal 3: Improving collaboration skills: working together in a team, discussing the following move, deciding on where to put the tile, what to observe while looking at other teams boards,*
- *Goal 4: Developing strategic thinking: building strategy during the game, thinking about where and why to put the next tile, when to use special skill, etc.,*
- *Goal 5: Improving decision making and negotiation skills,*
- *Goal 6: Developing communication skills in English.*

Using a board game encourages the development of 21st century competences. Players develop cooperative and communicative competences through group collaboration and communication, critical thinking, and the game encourages creativity and innovation through finding the best strategy to win.

### **3. Description, application**

"Planet Hexagon" is a competitive-cooperative game with hexes for 4 players or groups of 4 players, run by the game master. Representatives of 4 different civilizations have to regain their lost planet by founding a completely new civilization together, following the rules of peace, cooperation and balanced development. Each team has its own game board symbolising its civilization with its own characteristics and values (special abilities or main assets). Players must build a colony from different tiles representing terrain types and resources. Each team builds their colony on their own board, but all players use a common supply centre and exchange their main resources. In addition, each civilization implements its own hidden plan, carefully observing the actions of the other teams. The team that has the most developed colony and scores the most points wins. Points are awarded for different combinations of tiles and for the greatest number of tiles of a similar type. Success depends on how well players negotiate with



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

the other team members, what development strategies they use, and how far the other civilizations have advanced.

Each group starts with 1 tile and then plays 16 rounds, so that each group has 17 tiles at the end. Each round, the group draws 1 tile, which is available to them on the main table (supply centre). They then turn over a tile to influence the choice of tiles available to the next group, and draw a new tile from the bag and place it on the main table. Each round they can use their main advantage, which changes from round to round. Each group also has bonus points depending on their civilization description. In addition, face-down objectives are distributed at the beginning of the game, which also give points to the groups.

In the case of a group game (each group consists of up to 3-4 players and each group sits at its own table, with a main table in the middle on which new tiles are placed), the roles of each player in the group are also divided: The supplier (there can be two suppliers if there are multiple players) chooses a tile from the main table, the builder places the tile on the game board (placement is important for scoring), and the emissary is the only one allowed to move around the room and observe the other groups during the game.

#### **4. Advantages and limitations**

Advantages: Players during the game:

- develop communication skills through group conversations,
- develop cooperative skills by playing in a group,
- develop critical thinking skills by choosing a tile collecting strategy,
- develop English language skills by playing in international groups,
- vary their playing strategies depending on the flow of the game,
- thinking further ahead (which tiles they need).

Limitations:

- the game is available in English only,
- the game is not yet available in print for the general public and needs to be printed/produced before playing.



*Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

### **5. An example/illustration of how it can be applied in adult education**

The game can also be used to develop communication and cooperation skills, creative thinking and creativity in adult education. The game can be used to help participants get to know each other and by playing in groups they also learn how to cooperate and communicate. Group members can also be swapped during repeated play, playing a different role each time, so that each member can try out all the roles, get to know the other players, develop critical thinking and share ideas and strategies with teammates.

### **6. Conclusions**

The Planet Hexagon board game was designed for educational purposes with the main goal of developing 21st century skills (communication, collaboration, critical thinking, creativity and innovation). The main objective is to develop 21st century skills (communication, collaboration, critical thinking, creativity and innovation). During testing, we found that the objectives were met, that the players had a lot of fun playing the game, and that any failure motivated them to play again and perform better.

The game can be used for educational purposes in several ways: to introduce participants to each other, to stimulate communication, to develop critical thinking and creativity, and to improve communication in English.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## II.2.5. StoryLand of Options - SLO Game

### 1. Conceptual delineations

The board game Storyland of Options – SLO game (<http://game-it.net/SloGame.html>) is a result of a Erasmus+ project called GameIT: Gamestorming for Innovative teaching (2017-2020), prepared by the partners at the University of Ljubljana, Slovenia. The main objective of the project was to improve the quality of didactic methods and tools in higher education by designing and implementing innovative collaborative games to develop a selection of competences valuable in the 21st century labor market. Through games and gamification, students have the opportunity to practice and develop 21st century skills such as communication and collaboration skills, creative and logical thinking, awareness and openness to intercultural differences. StoryLand of Options - SLO Game is a role-playing game inspired by various geographical, economic, cultural and historical features of Slovenia. The player has to cooperate with his fellow players, famous Slovenian personalities from different regions, follow the roads of Slovenia and find the missing parts of the map by completing different missions. The success of the players depends on their imagination.





Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

## 2. Competence - key competences to which application of good practice contributes

- Multilingual competence;
- Mathematical competence and competence in science, technology and engineering;
- Cultural awareness and expression competence.

These competences are emphasised in learning goals within the game, which are:

- *Goal 1: students increase their general knowledge about Slovenia and Slovenian culture*

This learning goal is achieved by using a map of Slovenia, cards with different sights in Slovenia, characters are based on famous Slovenian people and stories students are creating are based on situations from Slovenian folk tales.

- *Goal 2: students practice and develop communication skills in English*

This goal is achieved by having the whole communication in the game and all materials in English. Also, students' stories should be written and told in English.

- *Goal 3: students practice and develop intercultural awareness and tolerance for differences: different perspectives and points of view, observation, empathy*

This goal is achieved by character creation. Students are creating different characters. Each character must have some characteristics, strengths, and weaknesses. Three of the nine character features are already predefined based on chosen famous Slovenian people. Students will have to put themselves in the role of different people and act like them.

- *Goal 4: students improve their decision-making skills and increase their ability to take practical and effective actions, etc.*

This goal is achieved by putting students in different problem situations from the ancient world. They will need decision-making skills and the ability to take practical and effective actions if they want to solve the problem situation successfully.

- *Goal 5: students practice and develop collaboration skills in English*



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

This goal is achieved by allowing students to play a game in pairs. Each pair will represent one player. Students in pairs will have to collaborate in English to create a common story. Students will in some cases have to collaborate in English with other players (pairs) to find the hidden word from the story.

### 3. Description, application

In the game, players are divided into two roles: (a) game characters / players, (b) game master.

The player characters are the ones who create their own character and solve different situations by telling stories on their way to find missing parts on the map of Slovenia. In each turn they play the role of storyteller once (they tell their story) and in all other turns of a round they are in the role of listener (they listen to the stories of their fellow players and guess the hidden words).

The game leader is a player who controls the action of the game, creates the framework of the game, determines if the players are following the rules, and assembles the players' stories into a coherent and meaningful game.

The game can be played in a classroom with a common table and a few tables for groups/pairs of students. To begin, all the game accessories are placed on the table. The teacher chooses a student to play the role of the game leader (GM). GM gives each player a blank character sheet, and each player chooses one of seven starting puzzle pieces. The starting puzzle defines the possible characters from which students can choose. Each player must fill out the character sheet. The player must add a nickname for their character and two additional traits, strengths and weaknesses.

After the character is created, it is time to start the first turn.

- *1st step in a turn - Choosing a sight:* The GM first allows players to choose one of two sights cards.
- *2nd step in a turn - Choosing a story:* Then the GM allows players to choose one of 47 stories. The GM can choose a story randomly (players tell the number or choose the number with random number generator from the web etc.).
- *3rd step in a turn - Choosing two random words:* The last thing players get in this turn is two random words from the.
- *4th step in a turn - Creating the story:* The player needs to build a story with a few sentences while being aware that the story has to include all the necessary information and should be continued at each step of the game. Players have 5 minutes to create the story. The necessary information is: (a) Maximum three-character features; (e.g. one weakness, one strength, one characteristic);



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

(b) The description from the sights card; (c) One hidden word (from two of them) used indirectly in the story; (d) Solution and continuing to a chosen starting story.

- *5th step in a turn - Gamemaster telling the starting story:* Now is the time for the GM to start the first round of storytelling. They start with the player with the lowest letter (players are noted as player A, B, C, D, E, F, G). The GM tells (or reads) the starting story of the first player.
- *6th step in a turn - Player continuing the story:* Then the player continues the story.
- *7th step in a turn - Other players guessing the hidden word:* Other players must listen carefully to the story since they need to figure out the hidden word if they want to get any points. When the player whose turn it is finishes their story, other players have a few seconds (maximum one minute) to write down their guess regarding the hidden word. The GM must announce the moment when all the players show the hidden word (it must be done at the same time so the players would not have time to cheat).

The score is determined based on the number of players who found the right hidden word. Players can denote the score on the character sheet and the GM can denote the score on the GM sheet.

#### **4. Advantages and limitations**

The game has a motivating effect on students and allows them to develop cooperation and communication skills. It also gives them the opportunity to develop their creative skills in creating characters and stories.

A game is limited to 4-15 players.

The game is intended to be played for a minimum of two school hours (90 minutes).

All game materials must be printed and prepared prior to the game, which can be time consuming.

#### **5. An example/illustration of how it can be applied in adult education**

The game can be used in schools in different subject areas. Since the game is very specific and connected to Slovenian culture, it can be used in subjects such as English grammar, Slovenian literature, computer science - game design. The game includes blank templates for the game board, sights and character cards, which allow some modifications of the game and its use in different subject areas. In addition, the game is also suitable for long-term non-formal learning. It can help achieve learning goals at different taxonomic levels, from simple memorization and recall to high-level goals such as creativity.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Example 1: The teacher can use the game as a starting point for time-consuming projects/assignments because playing the game gives learners the opportunity to work in groups, get to know each other, and become comfortable with role-playing.

Example 2: The teacher can use the game to practice learners' English grammar skills as they have to write stories, read the instructions, listen to others' stories and tell the stories.

Example 3: The teacher can modify the game so that the character cards represent social workers, the sight cards can represent different social events. The stories can be replaced with social work topics (examples of couples therapy, family therapy, work conversations, etc.).

## **6. Conclusions**

The game is primarily intended for college students; however, there is no age limit for playing. Students do not need any prior knowledge other than a basic knowledge of the English language. By playing the game, students increase their general knowledge of Slovenia and Slovenian culture; they practice and develop cooperation and communication skills in English; they develop intercultural awareness and tolerance for differences; they improve their decision-making skills and increase their ability to take practical and effective action. Moreover, age-old fairy tales in a game still attract learners. With problem situations within these fairy tales, learners are motivated to play and they put themselves in the role of a wizard, an extraordinary person living in ancient times, to develop creative solutions.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## II.2.6. Educational Computer Game for Nutrition Education

### 1. Conceptual delineations

The educational computer game Uživajmo v zdravju (Enjoy in Health) was developed as part of the Enjoy in Health project, funded by Norwegian financial mechanisms, which aims to encourage learners to adopt a healthy lifestyle. Through the game, learners should become familiar with and implement the basic recommendations of a healthy lifestyle. The aim is for learners to recognise and learn to plan and implement healthy daily physical activity and nutrition activities and to evaluate their own lifestyles. The content of the game is linked to the content defined in the curriculum of the nine-year Slovenian primary school.

#### References:

- KOSTANJEVEC, Stojan, ERJAVŠEK, Martina, JEDRINOVIĆ, Sanja, BEVČIČ, Mateja, LUŠTEK, Anja, LOVŠIN KOZINA, Francka. Development of an educational computer game for nutrition education. V: Abstract and conference materials. 11th European Conference on Games Based Learning, FH Joanneum, University of Applied Sciences, Graz, Austria, 5-6 October 2017. Reading: Academic Conferences and Publishing International, cop. 2017. Str. 43. Proceedings of the ... European conference on games-based learning (Print). ISBN 978-1-911218-56-2. ISSN 2049-0992. [COBISS.SI-ID 11783497]
- KOSTANJEVEC, Stojan, ERJAVŠEK, Martina, JEDRINOVIĆ, Sanja, BEVČIČ, Mateja, LUŠTEK, Anja, LOVŠIN KOZINA, Francka. Development of an educational computer game for nutrition education. V: PIVEC, Maja (ur.), GRÜNDLER, Josef (ur.). Proceedings of the 11th European Conference on Games Based Learning : FH Joanneum, University of Applied Sciences, Graz, Austria, 5-6 October 2017. Reading: Academic Conferences and Publishing International Limited, cop. 2017. Str. 343-351, ilustr., tabele. ISBN 978-1-911218-57-9. [COBISS.SI-ID 11784009]
- JEDRINOVIĆ, Sanja, LUŠTEK, Anja, BEVČIČ, Mateja, ERJAVŠEK, Martina, LOVŠIN KOZINA, Francka, KOSTANJEVEC, Stojan. The usability of the educational computer game for nutrition education. V: [Conference programme & abstract book]. GlobETS: An International Conference on Education, Technology and Science, May 6 - 9 May, 2018, Belgrade, Serbia. [S. l.]: [s. n.], 2018. Str. 40. [COBISS.SI-ID 12014921]



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## 2. Competence - key competences to which application of good practice contributes

The learning objectives of the Enjoy in Health computer game have been formulated on the basis of learning objectives defined in the curricula of various primary school subjects, in particular Home Economics, Modern Food Preparation and Food Culture. By taking into account the above objectives, the game can be used in various educational activities that are related to nutrition in terms of content.

We assume that the game will facilitate the achievement of the following educational objectives:

- Understanding healthy food recommendations.
- Classifying foods into groups in terms of predominant nutrient.
- Developing skills in making healthy food choices and combining foods to ensure appropriate meal variety.
- Recognise a person's energy needs in relation to various physical activities performed.
- Become familiar with the nutritional and energy values of foods.
- Developing a positive relationship with healthy eating.
- Promoting adequate fluid intake, especially water.
- Raising awareness of the importance of adequate physical activity for health.
- Understanding the importance of sleep.
- Promote healthy behaviours that support a healthy lifestyle.

These goals are consistent with the essential knowledge within the Personal, Social and Learning Skills competency.

## 3. Description, application

The game scenery represents a familiar living environment of children (and beyond) and includes a virtual home, school, hospital, sports fields, market, and shop. The scenery contains elements typical of a healthy urban environment. These include green spaces (trees, lawns), sports fields, and even mountains in close proximity to the location. The central character of the game is a student who lives in a virtual living



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

environment and plans his daily activities. At the beginning, the player learns how to play the game and the meaning of the symbols used in the game.



The symbols represent healthy lifestyle activities that the player plans and follows during the game. The player pays attention to the energy intake from food, the amount of fluid consumed, and the time for exercise activities during the day. In the activities he or she chooses and engages in each day, the player follows healthy lifestyle guidelines. In following these guidelines, the player acts on his or her own understanding of them.

Game activities	Description of activities
Beginning of the day (morning)	In the morning, the player takes care of his personal hygiene, selects breakfast and physical exercises; computer work can also be selected. For each selected activity, a certain amount of time is set. After these activities, the player goes to school. How many activities are done depends on the time available, as it can be allocated depending on the player's time of getting up.
School lessons	In school, the player reads some articles that are available. Their content relates to diet, exercise and sleep. A quiz with questions about nutrition is available. The player chooses a snack that is available.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

Buying food	The player selects foods at the market and shops to eat during the day. There are 176 foods available. Each food is represented with a picture and a table of nutritional and energy values.
The lunch	The player makes up his lunch from the foods selected in the shop and at the market. The player places the selected foods on the nutrition plate model and arranges them into food groups.
Free time	The player can decide whether to spend his free time actively on the sports field or playing computer games. The activities are limited in time.
The afternoon snack	The player prepares the afternoon snack with the foods he has chosen from the shop and the market.
Learning	During the learning time, the player can read articles about the characteristics of the different food groups and about physical activity. A variety of recipes are available for preparing meals.
The dinner	The player assembles dinner from the foods selected in the shop and at the market.
Playing virtual social games and sleeping	In the evening, the player can play virtual board games in the living room. It is his/her decision when to go to bed. Before going to sleep, he/she decides when to get up the next day. Make sure to get a sufficient amount of sleep.
A visit to the nutrition consultant	On the second day, the player visits the nutritionist who presents him/her with an analysis of his/her own lifestyle based on the activities performed on the first day. This analysis can help the player plan the new day and try to improve his lifestyle. On the second day, the same activities as on the first day are available.



*Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

#### **4. Advantages and limitations**

The game is primarily intended for children (and beyond) and primary school students, but is also suitable for lifelong non-formal learning.

The game is intended for a minimum of two school hours (90 minutes).

Learners will need a computer if they wish to play the game.

Unhealthy eating habits of children (and adults) have a significant impact on the development of various chronic non-communicable diseases. Therefore, it is important to encourage children (and beyond) to adopt healthy eating habits in both formal and informal education. The inclusion of educational computer games motivates children (and adults) to solve problems, improves the efficiency of the educational process, and potentially influences the formation of healthy eating habits in learners. The game can be used at different didactic stages of the educational process. We assume that the use of the game in the educational process will help to increase the motivation of learners to learn nutritional content and develop positive attitudes, intentions and behaviours related to a healthy lifestyle.

#### **5. An example/illustration of how it can be applied in adult education**

We believe that the presented computer game is a suitable didactic tool to teach content related to a healthy lifestyle. While playing the game, learners recognise their own life situations and make a fair evaluation through planning and assessment. The game allows teachers to use it with their own adaptations and methods. It can be incorporated into the teaching process as a stand-alone activity. However, it can also be used as a guided process where learners play the game in stages and teachers plan additional targeted activities for their learners that address specific content from the game. The game lends itself to individual learner work. In addition, it can be the central activity in participatory learning, where learners discuss with their peers the information and dilemmas that arise in completing the tasks in the game.

#### **6. Conclusions**

Incorporating active methods and didactic tools into the process of teaching children (and adults) content intended to stimulate the formation of a healthy lifestyle can help improve their motivation to apply the acquired knowledge in actual life situations. The Enjoy in Health computer game is a didactic tool that



**Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

stimulates learners' attention and motivation to learn and consolidate the intended content. The game can be used in the educational process as an individual activity or as cooperative learning. It is assumed that by controlling and planning their own daily activities (diet, exercise, sleep), learners will learn recommendations for a healthy lifestyle and improve them by reviewing their daily analysis provided by the game. First analyses show that the game is well accepted by the learners and is suitable to achieve the intended goals of the game.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

II.2.7. The implementation of SADDIE method in course ICT supported learning materials to support development of teacher competences

### 1. Conceptual delineations

We present here an example of good practice where the principles of game design-based learning have been successfully implemented in a teacher education programme of study to develop selected teacher competencies as defined in the Digital Competence Framework for Educators document. In the ICT-based learning materials course, students design an educational computer game on a selected computer science topic. The game creation process is based on the SADDIE method, the acronym for the stages of the game development process: specification, analysis, design, development, implementation and evaluation. This method is the result of more than ten years of research, development and refinement at the Department of Computer Science and Didactics, Faculty of Education, University of Ljubljana, Slovenia. With the help of the method we can introduce an active learning approach and the dialogical learning principles. The method has two important outcomes. The first outcome is the serious game itself, because it can be used by teachers in education who can include it in their learning process. The second outcome, the most important, is the motivation of students to actively participate in the design of the game in order to develop pedagogical and digital competences.

The theoretical basis for incorporating game design-based learning into the study process is based on the work of several influential authors. Kafai (2012) states that learning is most effective when students are involved in a design process where they create artefacts that are meaningful to them. Since computer games are popular with students of all ages, they constitute such an artefact. In the process of game design, they can develop important skills such as analysis, synthesis, evaluation, revision, planning, and monitoring (Wu & Wang, 2012). Because the computer game is such a complex example of artefact design (Qian & Clark, 2016), students need to be able to think critically, interpret, apply, and view different concepts from multiple perspectives (Rogers & Scaife, 1998). This can help students develop the 21st century skills defined in Qian & Clark (2016) and make learning more interesting (Seaborn et. al, 2012). An important aspect of game design learning is its social aspect, as it promotes collaboration and engagement in teamwork. Studies (Carbonaro et al., 2010; Wu & Wang, 2012; Spieler & Slany, 2018) show that game design-based learning can be successfully integrated into numerous disciplines, such as computer science, conceptual thinking, engineering, artificial intelligence, language skills, design, and art.

Dialogical learning provides one of the key theoretical foundations for the development of the SADDIE method. This is an approach to learning in which activities are organised so that students work together



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

to develop or modify a shared knowledge artefact (e.g., a game). The main premise is that learning does not take place only in one's own mind (monological approach) or through interaction with peers (dialogical approach), but when a learner interacts together with others through the artefacts during the design process of their creation. Group collaboration is a key feature of dialogic learning as it assumes that a group of learners can achieve more than an individual because the collective zone of proximal development (ZPD) is wider compared to the ZPD of an individual learner. ZPD is a concept developed by Vygotsky (1978). It is defined as the difference between actual and potential levels of development.

Competence - key competencies to which the application of good practise contributes.

The key competencies that can be achieved using the SADDIE method are as follows (Zapušek & Rugelj, 2021):

- The ability to define relevant learning objectives that are consistent with the curriculum.
- the selection of an appropriate didactic approach for the chosen learning topic and its implementation in the learning process,
- deciding on relevant and useful feedback from the teacher to the students,
- the ability to evaluate acquired knowledge and the learning process,
- the ability to communicate and collaborate with peers, with a teacher and with the use of digital technologies,
- the knowledge of creating and modifying digital content,
- the ability to solve conceptual problems and issues in digital environments, and
- Knowledge of and respect for copyright laws.

Description, application

The SADDIE method is based on project work in groups of 3 or 4 students. Students have to design and develop an educational computer game by following the established phases and keeping an activity log in which they describe their work in detail. The summary of the phases, objectives, activities and evaluation of the SADDIE method are summarised in the following table (Zapušek & Rugelj, 2021):



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

Phase	Goals	Activities	Assessment
<u>Specification</u>	<p>to define learning goals, teaching methods, and assessment</p> <p>to prepare the outline of the story</p>	<p>review of curriculum</p> <p>identifying a topic that is difficult to teach</p> <p>identifying didactic approach</p> <p>sketching the outline of the story</p>	<p>appropriateness of the selected learning goals</p> <p>suitability of the selected didactic approach</p> <p>suitability for the selected target group</p>
<u>Analysis</u>	<p>to analyse information relevant for game design and development</p>	<p>analysing available resources: hardware, software, time, workforce</p> <p>analysing learning goals</p>	<p>quality of resource analysis</p> <p>appropriateness of the selection of taxonomic level and type of knowledge</p>



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

<u>Design</u>	<p>to connect learning goals with the game</p> <p>to prepare a screenplay</p> <p>to prepare graphic elements of the game</p>	<p>linking the learning objectives with in-game activities and goals</p> <p>writing a screenplay, based on the story</p> <p>describing graphic elements of the game</p>	<p>quality of the learning objectives</p> <p>in-game activities and goals links</p> <p>quality of the screenplay</p> <p>quality of graphic designs</p>
<u>Development</u>	<p>to create graphic elements</p> <p>to code the game</p>	<p>drawing characters, objects and scenes</p> <p>coding the game or using drag and drop game development software</p>	<p>quality of graphic elements</p> <p>technical aspects of the game</p> <p>playability</p>
<u>Implementation</u>	<p>to integrate the game into learning process</p>	<p>preparing lesson plans</p> <p>preparing instructions (for teachers and for pupils)</p>	<p>didactic suitability of the game</p> <p>learning package</p> <p>ability to achieve learning goals</p>



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

		creating learning materials	
<u>E</u> valuation	to get feedback from peers, users and teachers	testing the game on peers	evaluation methodology
	to improve the game using feedback	testing the game on pupils	improvements based on feedback from players
		interviewing teachers	

In the following table you will find some examples of games created with the SADDIE method.

Learning topic:	Programming with blocks	cryptography
Story:	Rescuing friends trapped in the history.	Finding the reincarnation rod



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

Activities:	solving problems by assembling blocks representing different actions	solving puzzles based on the concepts of Caesar encryption and the column cryptogram
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Here we present some of the examples from the selected phases in the game development process:

**Specification – from educational game: History Journey**

Learning goals:

- Students will be able to represent an everyday problem as a sequence of steps.
- Students will be able to use an algorithm to represent a simple task.
- Students can represent an algorithm using instructions in simple language.
- Students compare several algorithms to solve a problem and can find the most appropriate algorithm based on given criteria (the goal is achieved through repeated play).

Motivating elements: stop-motion animation, compelling story, engaging graphics, open 3D world, in-game quests.

Methods to achieve learning objectives: Explanatory methods, discussions, practical application and demonstration.

Analysis - from the educational game: History Journey

Resources available: LeoCAD models, stop motion animation with Lego bricks, sound and voice recordings, use of open source image editing software.

Programming environment: Unity 3D

Target Users/Intended Use: Elementary students ages 9 to 12, in school or at home.

Learning Objectives Analysis:



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- Knowledge type: procedural knowledge, the player identifies the correct sequence of steps leading to a correctly performed task.
- Expected taxonomic levels of knowledge: Comprehension, application, and analysis.
- Gameplay: following instructions, building code with blocks, dialogs.

Design - from learning game: Let us go to the sea

Matching learning objectives to activities in the game:

- the learner knows what an IP address is - > analogy with house numbers (street address of the network, house number address of a device on the network)
- the learner knows what the job of the DNS server is - > the product is converted into a store number where it can be bought
- the learner knows how routers determine the route through the network - > at each node the appropriate route is determined according to the algorithm used in the routers

Advantages and limitations / limiting factors for the application

The advantages of incorporating game design learning into teacher education are that it can help teachers acquire the necessary digital literacy skills. We argue that the method can also be useful in adult education as it promotes collaboration, motivation and numerous other important skills. The main limitation of the method is the level of involvement of all stakeholders to implement it properly, as it requires a high level of active engagement that is sometimes difficult to achieve. It is also time consuming as it consists of many complex stages that need to be completed in the given order.

An example/illustration of how it can be used in adult education.

The SADDIE method could be applied in adult education using a simple game programming environment that does not require programming skills and where everything can be achieved in a drag-and-drop style for implementing game functions.

In the presented example of applying the method in teacher education, students had to choose a topic from the field of computer science. However, the method can be applied to other topics as well, since it is not tied to computer science. In adult education, students can choose any topic, apply the method, and create an educational game. While creating the game they will be able to acquire all the competences described above.



Erasmus+ KA2, ***GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

## Conclusions

The SADDIE method was developed to promote the process of improving the didactic competences that our students need to independently create educational materials. Students acquire didactic and technical competencies as well as teamwork skills. The didactic competencies that students are expected to acquire during the process described above include: establishing learning objectives that are consistent with the curriculum, reflectively considering the selection of learning objectives, classifying learning objectives according to taxonomic levels and types of knowledge, selecting appropriate activities that support learning at the preferred taxonomic level, identifying the concept behind the learning objective and being able to transfer the core idea to another context without losing important information, and preparing didactically sound feedback. Students also learn how to properly evaluate their work, acquired knowledge and learning process (Zapušek & Rugelj, 2014).

## References:

- Carbonaro, M., Szafron, D., Cutumisu, M., Schaeffer, J. (2010). Computer-game construction: A gender-neutral attractor to computing science. *Computers & Education*, 55(3), 1098–1111.
- Kafai, Y. (2012). *Minds in Play*. Hoboken, NJ: Taylor and Francis.
- Qian, M., & Clark, K.R. (2016). Game-based learning and 21st century skills: A review of recent research. *Computers in Human Behavior*, 63, 50–58.
- Rogers, Y., & Scaife, M. (1998). How can interactive multimedia facilitate learning? In J. Lee (Ed.), *1st International Workshop On Intelligence and Multimodality in Multimedia Interfaces. Research and Applications* (pp. 1–25).
- Seaborn, K., El-Nasr, M.S., Milam, D., & Young, D. (2012). Programming, PWNed: Using digital game development to enhance learners' competency and self-efficacy in a high school computing course. In *Proceedings of the 43rd ACM technical symposium on computer science education* (pp. 93–98). New York, NY: ACM.
- Spieler, B., & Slany, W. (2018). *Game development-based learning experience: Gender differences in game design*. Paper presented on 12th European Conference on Games Based Learning, France.



Erasmus+ KA2, ***GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Zapušek, M., & Rugelj, J. (2014). Achieving teachers' competences in the serious game design process. In *Proceedings of 8th European Conference on Games Based Learning: Vol. 2* (pp. 662–665). Academic Conferences International Limited, Reading.
- Zapušek, M., & Rugelj, J. (2021). Game Design-Based Learning for Preservice and in-Service Teacher Training. In *Technology Supported Active Learning* (pp. 165-186). Springer, Singapore.

## II.2.8. Castle Of Mind product family

### 1. Conceptual delineations

The [Castle Of Mind](https://www.castle-of-mind.com/) product family (COM\_ <https://www.castle-of-mind.com/>) is a series of games based on unique game mechanics. The creator of the unique COM game mechanics and games is Balázs Török-Szabó. The creator's goal was to create games that would develop players' thinking and thinking-related skills in a complex way during gameplay. In the games, strategy development, spatial awareness, decision-making and other skills and abilities are developed during gameplay in an exciting and playful way.





Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## 2. Competence - key competences

The games in the COM product family develop the following EU key competences

- **Communication in the mother tongue** (the ability of an individual to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing)
- **Learning to learn** (the ability to organize one's own learning individually or in groups)
- **Social and civic competences** (effective and constructive participation in social and professional life and active and democratic civic participation, especially in increasingly diverse societies)
- **Initiative and entrepreneurial competence** (the ability to realize ideas through creativity, innovation and risk-taking, and the ability to create and implement plans)
- **Cultural awareness and expressiveness** (recognition of the importance of the creative expression of ideas, experiences and feelings in different branches of art (music, literature, fine arts and the performing arts))

Other skills and abilities can be developed by using the game:

- Logical ability (inference, rule making)
- Strategic thinking (longer-term planning of actions)
- Critical thinking (multi-factor, complex way of thinking)
- Concentration (maintaining attention, focusing)
- Spatial vision (detection of objects and the spatial location of the observer)
- Organizing ability (recognizing the relationship of elements, arranging elements into a system, recognizing a system)
- Combining ability (creating relationships based on regularities)
- Conversion capability (exchanging between systems)
- Predictive ability (ability to “foresee”: consider the following possible steps, consider the differences and similarities of those)



Erasmus+ KA2, ***GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

### *3. Description, application*

The games in the COM product family simulate the way thinking works. The game mechanics are new, so patterns from other games (chess, mill, or other games) cannot be used. The rules are simple and easy to learn.

A unique feature of each version of the game is that the blow never occurs on the square where the pieces are moved - so the game can teach that the effect of an action does not always occur directly at the location of the action. In order to win, players must observe and pay attention to the entire playing field.

The random factor plays a minimal role in this game, so the outcome of the game depends entirely on the players and includes an endless replay option.

An important element is also that the players themselves can decide which figure and which color they attach more importance and value to - and they can change this spontaneously at any time.

The abstract version of the game won the Special Award of the International Match Day 2019 and the Audience Award in the Family Board Game category.

### *4. Advantages and limitations*

Advantages:

- Requires little financial investment
- The original COM game version can also be implemented as an online game

Limitations:

- The abstract board game version of Castle of Mind is hard to play for color-blind people
- It is not recommended for children under 3 years.

### *5. Example of its use in adult education*



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

In adult education, the game has been used in team building and skill development training. After a brief introduction to the rules, participants played the game in a practical training session between 1-6 hours per day.

For adults, where development with games was part of the training, participants played with each other for 1-2 hours per day over 2-3 days per week. During this period, the results of each game were recorded. Assessment of skills took place both before and after the training. The research showed that the skills and abilities measured showed game-related development in most cases.

Other applications:

- Fontanus Academy in Adult Education with 150 participants.
- In the fall of 2019 among students at the Budapest University of Economics majoring in physical education and recreation, with about 50 people.
- "COME to play! - COM to all schools" for the education of 8-16 year old students in Hungarian and cross-border schools, as a development tool and pedagogical aid. (e.g. BGSZC Pesterzsébet Vocational High School of Economics, BMSZC János Neumann Vocational High School of Computer Science)
- In the framework of team builders (e.g. Legal, Codification and Coordination Department of the Prime Minister's Office)

## 6. Conclusions

The rules of the game are simple and quick to learn. The game can be played by two or more players according to the given rules. The game can be used to develop a number of skills and abilities that are useful in the modern age (insight into complex systems, planning, decision-making, creativity, critical thinking). These skills and abilities are so-called "soft skills", the development of which is expected in both children and adults. Of particular note is critical thinking, which is the coherent use of a range of skills - including the process of gathering experience, filtering, testing and questioning information received, decision making and ability, and creativity.

The members of the Castle of Mind product family not only develop the skills related to creative work, observation and logic, which are the cornerstones of science, but as a popular game, they also make thinking and the possibility of creative thinking attractive.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## II.2.9. The Water Skyball sport as a physical and mental development methodology (<https://www.waterskyball.com/>)

### 1. Conceptual delineations

Water Skyball (WSB) is an exciting water sport developed by Hungary with special rules and played by two teams of two. The rapidly spreading and increasingly popular game was developed in 2014 by Balázs Török-Szabó, the technical director of the Fontanus Scientific Methodological Research and Education Center, together with Péter Hacker. His aim was to create an educational method that can be played on a broad basis and for a wide range of ages, has a minimal risk of injury and has a developmental effect in several areas. The game is played by teams of two against each other, in water, with a ball, on a goal. The goal-in-goal solution of the game can result in quite unusual goals with different scores. This not only makes the game more interesting, but also opens up opportunities to implement a variety of tactics.

The original game has become a sport in its own right within a few years, and its popularity is growing year by year. In addition to various game demonstrations and amateur tournaments, national tournaments have been held since 2015 and are broadcast on national television.

### Competitive sports:



### Grass root (leisure) sport:



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*



## 2. Competence - key competences

Water Skyball is developing the following key EU competencies:

- **Communication in the mother tongue** (the ability of an individual to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing)
- **Learning to learn** (the ability to organize one's own learning individually or in groups)
- **Social and civic competences** (effective and constructive participation in social and professional life and active and democratic civic participation, especially in increasingly diverse societies)
- **Initiative and entrepreneurial competence** (the ability to realize ideas through creativity, innovation and risk-taking, and the ability to create and implement plans)
- **Cultural awareness and expressiveness:** recognition of the importance of the creative expression of ideas, experiences and feelings in different branches of art (music, literature, fine arts and the performing arts).

The following abilities and skills can be developed using the method:

- Strategic thinking (longer-term planning of actions),
- Spatial vision (detection of objects and the spatial location of the observer),



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- Predictive ability (ability to “foresee”: consider the following possible steps, consider the differences and similarities of those),
- Concentration (maintaining attention, focusing),
- Organizing ability (recognizing the relationship of elements, arranging elements into a system, recognizing a system),
- Creativity,
- Combining ability (creating relationships based on regularities).

### 3. *Description, application*

One of the key elements of the method is the so-called no-touch principle, the essence of which is that players are not allowed to touch each other, so they watch each other closely to protect each other's - and their own - physical integrity. Because of the no-contact principle in the training method and in the game itself, great emphasis is placed on attentiveness, tactics, skill, recognizing situations and working together as teammates. Also, the ball is not won directly by specifically taking the ball from the other team, but through a strategic move.

One of the key elements of the training method is that the movements belonging to WSB are performed by the players in a special medium, namely waist-high water. The factors arising from the fluid resistance of the water, firstly, put a special strain on the person performing the movement, as it requires a completely different muscular load to move in water 100-120 cm high, to perform sudden starts and stops, rapid changes of direction, throws, jumps and other athletic movements that are not comparable to any other sport. Second, bridging the transition between the two mediums is also a special element, as both the temperature difference (warmer air, cooler water) puts a special strain on the body and the execution of continuous movements (e.g., throws supported by the legs) can be learned and affect the player in unique ways. Third, the watery medium minimizes the risk of injury.

The effects of the method have been examined in several studies, the results of which suggest that the WSB game is an effective developer of skills and abilities. Development can be observed on the physical



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

level as well as in thinking. In addition to strength, endurance and speed, it develops strategic and abstract thinking, cognitive flexibility, coordination skills, movement accuracy, sense of rhythm, body-part-object coordination, spatial perception and spatial orientation, creativity and team thinking. Since it is also necessary to learn new movements in order to play the game as effectively as possible, it can also continuously develop brain-nerve connections and nerve-muscle connections, which are also closely related to the development of thinking.

#### *4. Advantages and limitations*

Advantages:

- Due to the non-contact nature, the sport can be played by almost anyone, of any age (even for small children if the water depth is adequate).
- It takes into account the balanced, healthy functioning of the body through a combination of different types of movements and types of training.
- Joint activities have a community-creating and community-shaping effect.
- Water Skyball is healthy and natural for the human body, although it now requires special movements (100-120 cm deep pool, water medium).

Limitations:

- The solution in the gate and the design of the track require special equipment and investment.
- People with reduced mobility have limited ability to play the game (however, the training method also has a rehabilitative and developmental effect even for them).

#### *5. Example of its use in adult education*

In adult education, the training method and the use of the game itself have been implemented in physical education classes and in a separate course and training.

For adults where development with the game was part of the training, participants applied the method 1-2 days per week for 2-4 hours each. Assessment of skills was evaluated before the training and at the



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

end of the training. According to the results of the survey, the skills and abilities assessed showed game-related development.

Applications:

- Fontanus Academy in adult education with approximately 80 people.
- As of autumn 2019, it was used by students of the Department of Physical Education and Recreation of the Budapest University of Economics as training in a physical education class, in which 40 people participated.
- In the form of WSB trainings for adults (in the cities of Szeged and Budapest), which were offered once a week for 2 years and attended by about 100 people.

## 6. *Conclusions*

Water Skyball is a new water sport developed in Hungary with special rules, played by teams of two. The rapidly spreading, increasingly popular game is the brainchild of the Fontanus Centre's professional leaders, Balázs Török-Szabó and Péter Hacker, developed with the Centre's research team as a separate educational tool. The aim was to create a developmental game that places great emphasis on tactics, skill and situational awareness in addition to physical skills. Thus, development is not limited to physical skills, but mental skills are also emphasised. The game is completely non-contact, so the risk of injury is minimal.

Since the game's development, several national tournaments (men's and women's, Division I and II ) and amateur tournaments have been held, and no injuries have occurred at these tournaments or at the regular training events or summer road shows.

Due to the positive response and the development curve of Water Skyball so far, the new sport and training method developed in Hungary is suitable for national and international dissemination.

Since 2015, the official national WSB championship for adults has been held every year, which has been broadcast on national television since 2020.

In addition to the domestic application, the teaching method is currently used in several countries, such as Slovenia, Croatia, Germany and the USA.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## II.2.10. Balance<sup>2</sup> movement therapy training method

### 1. Conceptual delineations

Balance<sup>2</sup> brings together the results of several years of research by the Fontanus Scientific Methodological Research and Education Center's professional team studying body image. The aim of the members of the research team, Dr. Bajzik Éva, M.D., Balázs Török-Szabó and Péter Hacker, was to develop a pleasant and healthy form of exercise, tailored to the needs of the people of the 21st century, which develops effectively and whose regular use achieves a healthy and dynamic balance of the body.

The special exercises are performed on a 1 m<sup>2</sup> tatami. For each exercise, for each situation, it is important where a part of the body is located within the square, so separate instructions warn about it in each exercise.

The exercises target the middle of the strength-endurance-speed triangle, meaning that they develop all three areas equally while simultaneously developing all coordinative skills.

The tests were conducted with nearly 100 participants from 2015 and with the assistance of Dr. Bajzik Éva M.D., a specialist in musculoskeletal rehabilitation.



### 2. Competence - key competences



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

Balance<sup>2</sup> movement therapy training method is developing the following key EU competencies:

- **Communication in the mother tongue** (the ability of an individual to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing)
- **Learning to learn** (the ability to organize one's own learning individually or in groups)
- **Social and civic competences** (effective and constructive participation in social and professional life and active and democratic civic participation, especially in increasingly diverse societies)
- **Initiative and entrepreneurial competence** (the ability to realize ideas through creativity, innovation and risk-taking, and the ability to create and implement plans)
- **Cultural awareness and expressiveness** (recognition of the importance of the creative expression of ideas, experiences and feelings in different branches of art - music, literature, fine arts and the performing arts)

Other abilities and skills can be developed using the method:

- Spatial perception, spatial abilities (detection of objects and the spatial location of the observer and orientation in space)
- Creativity
- Concentration (maintaining attention, focusing)
- Static and dynamic balance
- Sense of rhythm
- Space-body coordination
- Space-body-body part coordination

### 3. *Description, application*



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

The development began with the results of earlier research, according to which the anatomical structure of the body is still prepared for the same tasks that were necessary for survival thousands of years ago, in prehistoric times.

Movements require a complex and well-structured nervous system. The more complex the movements a body can perform, the more advanced its nervous system. From this perspective, the brain can be considered part of the musculoskeletal system.

From birth to the age of about 10-12 years, the musculoskeletal system, sensory functions and, in addition, the functions of the nervous system that regulate movements and determine the child's behavior, as well as the cardiovascular and respiratory systems, develop particularly intensively. For their development, it is necessary that the child receives as many and varied movement-related stimuli as possible.

In infancy, the stage of movement development and its regular sequence are essential for the development of a healthy musculoskeletal system, a healthy physique and movement. The sequence (leaning on the abdomen, rotation, crawling, creeping, sitting up, standing up and walking) means continuous strengthening of the muscles and joints and at the same time leads to optimal maturation of the nervous system.

The lack of a basic movement (e.g. crawling or creeping) affects both the physique and movement and the development of the nervous system. While there are methods and occupations for children to correct the problems, there was no method to treat the problems observed in adulthood (e.g., attention deficits, excessive irritability, hand-foot coordination disorders, imbalance, etc.).

Based on this, developmental exercises have been compiled that can effectively improve the physical and mental levels of the body, brain, and individual during movement. Basic exercises lay the foundation of coordination skills to include static and dynamic balance exercises, as well as exercises that develop dexterity, spatial awareness, and a sense of rhythm in a fun way. The exercises can be used to effectively make up for missed steps in movement development in adulthood, as well as to rehabilitate the body after an injury or illness.

Thanks to the exercises, the nerve-muscle connections can be developed effectively.

#### *4. Advantages and limitations*



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

Advantages:

- Can be used at any age over 8 years of age,
- can be used together by users of different languages,
- can be used outdoors or indoors,
- small space requirement,
- wide applicability (from ordinary people to elite athletes),
- supports the preservation of health,
- can also be used in rehabilitation,
- strength, speed, endurance can be developed simultaneously by it,
- Based on the intensity of the exercises and the health condition of the performers, we can talk about the following types:
  - **ReFit** is a movement specifically for rehabilitation purposes and can be used on medical advice.
  - **PreFit** is the basic type of Balance<sup>2</sup>.
  - **FreshFit** and **FullFit** are developmental hours of increasing difficulty.
  - **Balance Minus** builds on negative muscle movement, increases flexibility, mobility and range of motion.
  - **Extreme** and **Myrmidons** are special exercise plans with a special load developed for athletes.

Limitations:

- equipment is needed, which is the 1 m<sup>2</sup> tatami,
- the acquisition and correct execution of the exercises initially requires the presence of an instructor,
- partially accessible to persons with reduced mobility.



Erasmus+ KA2, ***GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

#### *5. Example of its use in adult education*

- Within the framework of the curriculum of the Fontanus Academy, involving nearly 100 people, 2-3 times a week.
- In 2019, the University of Szeged used the basic type (Prefit) for 2 semesters for 4 semesters, involving 100 people.
- During individual / group occasions, the basic type was also used in the business sector, in the framework of in-company training and team building (e.g. Balabit Europe Kft., INU Kft., British Petrol).
- In 2019, the Budapest University of Economics applied the basic type (Prefit) in the Physical Education and Recreation department, within the framework of a physical education class, for 2 semesters a week for 2 semesters, involving 100 people.

#### *6. Conclusions*

The Balance<sup>2</sup> movement therapy training method is a specially developed method with the help of a musculoskeletal rehabilitation specialist that creates balance in the body, between individual muscles, between organ systems and throughout the body.

The exercises include static and dynamic balance elements as well as playful dexterity exercises, exercises that develop spatial awareness and a sense of rhythm. The exercises can be used to effectively make up for missed steps in movement development in adulthood and to rehabilitate the body after an injury. Thanks to the exercises, the nerve-muscle connections can be effectively developed and the dynamic balance of the body can be achieved or restored.

The regular use:



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- strengthens the supporting muscles,
- strengthens the muscles around the joints, thus increasing their load-bearing capacity,
- stretches muscles and tendons, strengthens ligaments,
- improves balance, improves spatial perception,
- develops the execution of continuous movements,
- develops neural connections between different areas of the brain through complex movements,
- thereby also developing cognitive abilities,
- helps to balance the metabolism,
- promotes the balance of the hormonal system,
- initiates the progression of the immune system in the direction of equilibrium.

Adult education is a new and exciting opportunity for the simultaneous development of mental and physical skills, and at the same time the developmental effect is more effective. In adult education, physical skill development is generally not paid so much attention, while the effectiveness of mental development can be increased by physical exercise, and the knowledge transfer is more fun.

## II.2.11. Skyhunter

### 1. *Conceptual delineations*



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

Skyhunter is a team game where two teams compete against each other in different movements. For example, using natural movements such as running, bear crawling, spider crawling, crab crawling, or bunny hopping. The game is one of the few forms of exercise that develops all three conditional skills, i.e. strength, endurance and speed, at the same time. It also develops almost all coordination skills, including speed coordination, situational awareness and problem-solving skills, balance, spatial awareness, creativity, and a sense of rhythm.

Skyhunter, like several physical-mental games, is a development of the Fontanus Scientific Methodological Research and Education Center. The games were compiled by the Fontanus research team led by Balázs Török-Szabó. From 2014, the members of the research team conducted the tests with the support of Dr. Bajzik Éva M.D., a specialist in musculoskeletal rehabilitation, and with the people involved in the tests.



## 2. Competence - key competences

The following EU competence can be developed using Skyhunter game:

- **Communication in the mother tongue:** the ability of an individual to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

- **Learning to learn:** the ability to organize one's own learning individually or in groups.
- **Social and civic competences:** effective and constructive participation in social and professional life and active and democratic civic participation, especially in increasingly diverse societies.
- **Initiative and entrepreneurial competence:** the ability to realize ideas through creativity, innovation and risk-taking, and the ability to create and implement plans.
- **Cultural awareness and expressiveness:** recognition of the importance of the creative expression of ideas, experiences and feelings in different branches of art (music, literature, fine arts and the performing arts).

The following abilities and skills can be developed using the game:

- Sense of rhythm
- Space-body coordination
- Space-body-body part coordination
- Spatial perception, spatial abilities (detection of objects and the spatial location of the observer and orientation in space)
- Creativity
- Concentration (maintaining attention, focusing)
- Static and dynamic balance

### 3. *Description, application*

The game consists of 3 teams, in each round there is a running team, a team that moves in spider crawling / crab crawling / bear crawling, and there is a team that moves in hare hopping / hobble fox on the right leg / hobble fox on the left leg and collects points according to the rules. The number of teams and the number of rounds are set so that each team can try their hand at each role. A team's score per round is



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

the sum of the individual scores of the team members, and the total score is the sum of the scores of the three rounds.

During the playful movement exercises, the physical and mental levels of the body, brain and individual can be effectively developed. Experiments have shown that physical-spiritual and mental development can be initiated through the specific experiences gained during sports, exercise, and movement games by grasping these experiences and understanding the connections.

Furthermore, even in the context of physical activity, research shows that most skills that can be acquired in school can be learned much more effectively when they can be combined with hands-on, physical experiences. Selecting the right movements and experiences and combining them with the mental parts can become well-functioning methods for the acquisition and development of basic skills in practice.

Application of the method:

- rule description (description of the field/track, the goal(s), correct implementation of the movements, etc.)
- formation of teams (taking into account individual abilities and number of players)
- track design, equipment preparation, presentation of those
- warming up
- trial game (highlighting the more critical points, presenting and correcting the implementation of the exercises)
- game (continuous inspection, correction, scoring)
- end of game (stretching)
- evaluation, sharing experiences (apprehension)

#### *4. Advantages and limitations*

Advantages:

- can be used at any age over 12 years



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- can be used together by users of different languages
- rules that can be easily modified and varied (depending on the number of people, age, circumstances)
- requires little financial investment
- can be easily integrated into any training
- joint development of both physical and mental abilities
- health preservation
- also excellent for team building
- the game, as all the games of Fontanus, is non-contact, this rule simultaneously minimizes the risk of injury and promotes the development of thinking and creativity

Limitations:

- equipment requirements for the field, the formation and distinguishability of the teams
- partially accessible to persons with reduced mobility

##### *5. Example of its use in adult education*

- Sport and exercise-related games are an essential part of the curriculum of the Fontanus Academy for adult education.
- Hundreds of people have played the offline version of selected computer games in the organization of Game Over (<https://sportoljma.hu/sportkozossegek/game-over-gyere-ki-a-valosagba-O21SMQxjWqbe>)



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

## 6. Conclusions

The performance of both recreational and athletic movements requires that the nervous system's control function, neural connections, and neuromuscular connections function effectively and well. At the same time, Fontanus' research proves that movement-based games go far beyond movement development and, when used appropriately, are also useful for mental development.

All physical-mental games developed by Fontanus are non-contact, i.e. direct physical contact is not allowed. On the one hand, this minimises the risk of physical injury, and on the other hand, the exclusion of certain physical possibilities from the game forces the development of mental skills: situational awareness, the recognition of opportunities, cooperation, the use of ideal power and strength, and the emphasis on tactics and other game elements and skills.

In adulthood, play increasingly shifts from the physical to the mental, with the instinctive development of cognitive skills becoming more important. Instead of the connections between brain, nerves and muscles, the focus is on developing connections that link different areas of the brain: Logic, memory and perceptual development, and there is an emphasis on games that develop these.

- In adult learning, a new and exciting opportunity exists in the simultaneous development of mental and physical skills, and at the same time the developmental effect is more effective.
- In adult education, not so much attention is generally paid to the development of skills at the physical level, while the effectiveness of mental development can be increased through physical exercise, and the transfer of knowledge is also more fun.

### II.2.12. Philosophical Theme Card

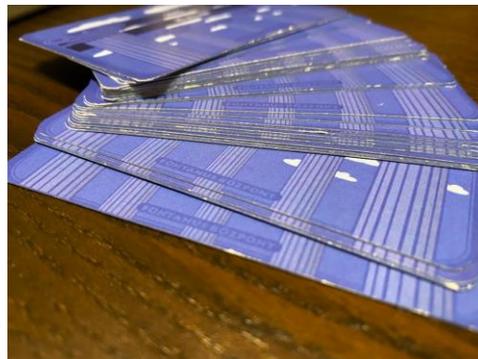
#### 1. Conceptual delineations:



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

The Theme Card is one of the developments of the Fontanus Scientific Methodological Research and Education Centre. The game was developed by Balázs Török-Szabó. It was tested in 2017 by the members of the research team, Dr. Sándor Laczkó, associate professor at the Faculty of Philosophy of the University of Szeged, and the people involved in the tests.

A topic card is a communication-oriented card game in which the topics are given by cards with word pairs and the game is conducted around the meaning of words and the contexts of word pairs, typically verbally.



## 2. *Competence - key competences:*

EU key competencies that can be developed with the Philosophical Theme Card

- **Communication in the mother tongue** (the ability of an individual to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing)
- **Learning to learn** (the ability to organize one's own learning individually or in groups)
- **Social and civic competences** (effective and constructive participation in social and professional life and active and democratic civic participation, especially in increasingly diverse societies)
- **Initiative and entrepreneurial competence** (the ability to realize ideas through creativity, innovation and risk-taking, and the ability to create and implement plans)



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

- **Cultural awareness and expressiveness** (recognition of the importance of the creative expression of ideas, experiences and feelings in different branches of art) (music, literature, fine arts and the performing arts)

Other abilities and skills:

- develops logical skills (drawing conclusions, making rules)
- develops logic and reasoning develops reasoning skills develops creativity
- Combination ability (creating relationships based on regularities)
- Conversion ability (exchange between systems)

### 3. *Description, application:*

In the Philosophical Theme Card game, players conduct dialogues on a variety of philosophical topics, learning to argue, refute, question, take a stand, clarify concepts, and spin logical threads.

Each card contains a pair of concepts. Once the player has drawn a card, they must try to connect the two concepts according to some regularity. This can be a correlation or a logical connection, but the player can also claim that the two concepts have nothing to do with each other. The other players who disagree with this statement will state their position. The player with the card chooses one of the candidates and then tries to convince the candidate of his position with arguments.

In this part of the game, all rhetorical devices are allowed. Players can question each other, argue, refute, and so on. If the player with the card convinces his challengers, he can draw another card and gets points.

### 4. *Advantages and limitations*

Advantages:

- participants interact with each other, making contact with each other through conversation



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

- helps to get to know the meaning of concepts, to see connections
- both theory and practice are emphasized throughout the game
- playing time is flexible
- requires little financial investment

Limitations:

- participants may not be familiar with the actual meaning of a concept (this is covered by the rules)
- can be used by speakers of the same language

#### 5. *Example of its use in adult education*

The use of the Theme Card is an essential part of the adult education curriculum at Fontanus Academy.

- Fontanus Academy has used it in its adult education courses in philosophy, communication, and argumentation, in which nearly 250 people have participated.
- In the joint training program of Fontanus and the Szeged Police High School, in which 50 people participated.
- In the communication trainings of the Fontanus Center.
- The Fontanus Center offers training courses specially designed for lawyers.

#### 6. *Conclusions*

The aim of the philosophical thematic card game is to learn the basics of philosophy in a playful way. The game teaches you to recognize and apply the basics and their connections.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

Players draw cards with different words and word pairs. Each player is in the game as long as they are able to defend their point of view on the terms on the card and their meanings (and even the relationships between several terms on subsequent levels). The game can be played at several levels of difficulty, ensuring continuous and gradual development.

The essence of the game is the process and the conversations in which players try to convince, refute or understand each other. The topics have been composed in such a way that they can be applied to real problems. In this way, the game approaches theory from a practical point of view, so that the knowledge acquired will also be practical knowledge.

II.2.13. LEVEL UP! Designing game-based practices for migrant children inclusion

Source: <https://www.levelup4inclusion.eu/mooc/>

### Partnership

Coordinator:

[AYUNTAMIENTO DE ALTEA \(ES\)](#)

Partners:

[Associazione 2050 \(IT\)](#)

[Društvo Za Razvijanje Prostovoljnega dela Novo Mesto \(DRPDNM\) \(SLO\)](#)

[Daugavpils pilsētas Izglītības pārvalde DPIP \(LV\)](#)

[SSW Collegium Balticum \(PL\)](#)

[Wesley János Óvoda, Általános Iskola, Szakiskola és Gimnázium \(HU\)](#)

[Casa Corpului Didactic Teleorman \(RO\)](#)

The "LEVEL UP" project targets immigrant students and aims to promote inclusion and respect within schools by introducing gamification systems in education. This approach, commonly known as gamification, which incorporates game elements such as storytelling, problem solving, rules, collaboration, competition, reward systems, feedback and learning through trial and error in non-game situations, promotes engagement, participation and teamwork in schools.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

The results of the project are elaborated and summarised in an Interactive MOOC (<https://www.levelup4inclusion.eu/mooc/>) with pop-up elements translated in English and in all the languages of the project partners:

module 1: introduction to gamification and main elements (4 units), module 2: focus on game-based learning for children with migrant background or disadvantaged groups ( 2 units), module 3: focus on game-based activities for key transversal skills (communication and interpersonal, cultural, entrepreneurship, team work- learning to learn , active citizenship etc) (2 units), module 4: focus on game-based activities related to key curricular skills (language, STEM, digital – others) (2 units).

[Guidelines for planning, implementing and assessing GameBased activities:](https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Guidelines-for-planningimplementing-and-assessing-GameBased-activities.pdf)

<https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Guidelines-for-planningimplementing-and-assessing-GameBased-activities.pdf>

A collection of game based activities and good practice, related to transversal skills:

[https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice\\_M3.pdf](https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice_M3.pdf)

A collection of game based activities and good practice, selected by our project partners, related to key curricular skills: [https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice\\_M4.pdf](https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice_M4.pdf)

II.2.14. Improving “Problem solving in technology-rich environments” skill of low-skilled adults with gamification, serious games and LARP – skillUPgame

Source: <https://ciktrebne.si/projekti/skillupgame/>

<https://ciktrebne.si/wp-content/uploads/2019/10/IO1-NEEDS-ASSESSMENR-REPORT-AND-PROJECT-GUIDELINES.pdf>

Project duration: 1.11.2019 – 31.10.2021

At European and national level



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

Partners in the project:

CIK Trebnje (Slovenia)

[Mise HERo s.r.o.](#) (Czech Republic)

[BETI Institute](#) (Lithuania)

[I and F education and development limited](#) (Ireland)

[Fundación Aljaraque](#) (Spain)

The MAIN AIM of the project is to develop or foster the skill of "problem solving in technology-intensive environments," which according to the most recent PIAAC study is low among adults. At the same time, this skill is central to successful functioning in current and future occupations, as well as successful functioning in everyday activities. "Problem solving in technology-intensive environments" is defined as the ability to use digital technologies, communication tools, and networks to obtain and evaluate information, communicate with others, and perform practical tasks. It is a combination of mastery of several basic skills: digital literacy, literacy and numeracy in the information society. To this end, the project will develop a comprehensive and participatory curriculum and methodology for adult educators for the development of basic skills in the information society using gamification, serious games and LARP that incorporate the principles of adult learning (knowledge, experience and motivation) to make the learning experience more interesting, engaging and effective. LARP: Live Action Role Playing - Games that involve role playing are excellent for experiencing specific situations. The scenarios can be complex and very dynamic. Immersive experiences help develop an understanding of real life situations. The level of complexity is matched to the skill level of the participants so that no matter what their skill level, they feel comfortable creating the story for most of the activity.

II.2.15. MegaVET “Move to Enhance the Gamified Applications in Vocational Education Training” Project

Source: <https://www.sc-nm.si/sestg/megavet/megavet-book.pdf>

Project’s website: <http://www.mega-vet.eu/>

At European and national level



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

MegaVET is a book about gamification and about the Android application. It was written by members of the Erasmus+ project "Move to Enhance the Gamified Applications in Vocational Education Training (MEGAVET)". The free book contains chapters that are an offline guide for teachers, based on the Android application and explaining the key facts about gamification. The MegaVET book is not only a guide, but also a turnaround, especially for teachers involved in the educational process. It enables teachers to understand their new role in transforming teaching methods to achieve the desired results. Moreover, we learn how to create effective learning experiences among students through gamification and how to develop challenges to find solutions to various problems.

Mega- VET web based online game; is an interesting and functional platform which includes 4 different units in the field of electronics, amplifiers, rectifiers, mechatronics, three and four phase systems. This game available on the website is connected to the android platform which aims to test the progress and performance of the students under the control of their parents. The main structure of the platform, designed by the Slovenian team, has been enriched and extended by the contributions of the Turkish, Greek, Italian and Slovenian teams.

MegaVet android application: <http://www.mega-vet.eu/game/>

Mega VET Android; is a platform that Parental monitoring is available to learn how much their children spent time in playing the game and how well they provided performance while doing the extras, clues and exercises.

#### II.2.16. PROJECT: ESCAPE AND FLIGHT

**Name of the Organisation: Forum for Equitable Development / Forum za enakopraven razvoj - FER**

**Country: Slovenia**

**Type of Activity: outdoor educational escape game**

Source: [https://www.clarinetproject.eu/wp-content/uploads/2019/07/Escape\\_and\\_Flight.pdf](https://www.clarinetproject.eu/wp-content/uploads/2019/07/Escape_and_Flight.pdf)

Project description: It is important to understand that asylum seekers and refugees are victims and not perpetrators who seek protection in our countries. To achieve this shift in consciousness, it is necessary to promote approaches that go beyond the very traditional approaches of national security and promote acceptance of diversity. We address the fear of refugees by using two approaches in parallel. The first approach is understood by psychologists as an "identifiable victim effect" to generate positive feelings



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

toward refugees. The approach is based on the fact that it is easier to empathize with a specific person than with a number. The second approach is "gamification", which uses game principles and elements in a non-game context. With the support of gamification experts from "MindMaze", a journey through the streets of Ljubljana was developed. The 1.5-hour journey is an outdoor version of the "Escape Room". The challenges they face on their journey are based on the true escape of a refugee who traveled from Afghanistan to Ljubljana in a period of four months. All "Escape Room" experiences end with a video featuring a young refugee from South Sudan and a discussion with the so-called "Game Keeper". Through the discussion, the participants, especially the young people, become aware of the connection between their flight and the flight of a real refugee. The reflection at the end of the game is very important, so it is organized for each group.

#### II.2.17. USING VIRTUAL REALITY APP IN THE CLASSROOM

Developed by School of Mechanical Engineering, Mechatronics and Media in Celje

Source: <http://konferenca.sc-celje.si/wp-content/uploads/2020/11/ZBORNIK.pdf>

Virtual reality technology is particularly useful when it comes to teaching vocational subjects. Similar to simulation, virtual reality places the student in a real-life situation where he or she must perform a specific task under the supervision of a pedagogically trained teacher. It is an effective method of experiential learning in which the student tests and justifies the knowledge they have acquired. Learning through virtual environments (simulations) is active experiential learning and promotes the development of useful skills that individuals encounter in the environment.

In 2017, the Faculty of Mechanical Engineering, Mechatronics and Media in Celje developed a virtual reality application for the Graphic and Reproduction Systems course. This was a learning project to create an app that allows you to see Gutenberg's printing press and the impression of the printing form.

When the students put on the glasses, they already feel like they are in a different room. So the teacher has the students look around first. The experience is new and it takes them a while to get used to it. Then the teacher continues with the explanations, leading the students through a museum like a guided tour. During the animation, the teacher introduces the components of the printing press and explains how the printing press works. This makes it much easier for the students to understand the printing process than if they had only seen a static photo of the model.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

In 2019, in collaboration with the Slovenian Beekeepers Association, they also designed and developed a virtual reality app called "Čebelarjenje VR / Beekeeping VR". With this app, the Slovenian Beekeepers' Association aims to educate beginners in beekeeping and introduce them to working with bee colonies. The virtual reality app can be viewed via a display and two controllers. The viewer has the feeling of being in a beehive where he can move around, view the space in virtual reality, touch objects and perform beekeeping activities.

## II.2.18. Hi-Quest

### **1. Conceptual delineations**

**Hi-Quest** - developed through a complex process of Design Thinking and Board Game design, by the Innovative Project Arena, through a Horizon 2020 grant (<https://www.socialchallenges.eu/en-GB/city/0/pitches/2368>).

Nonprofit education experts and individuals specializing in board game development were involved.

The board game is played for 14 weeks. A whole group of people are involved. The group is divided into teams of at least 4 players. For one hour per week, teams set their game strategy, complete a series of challenges, and receive resources to help them progress on the board and enter one of the 7 cities. They must explore this city through a series of challenges that they must complete outside of a formal educational setting.

### **2. Competence - key competences**

Using the general concept of "Școala pe care nu o ai" ("The school you do not have"), players will complete a series of individual and team tasks - Hi-Quest - that revolve around the key competencies that make them better people - kinder (heart) and smarter (mind). The Hi-Quest board game is an educational journey to conquer cities, embodying essential skills based on the hero's journey and teamwork.

The game is based on 21st century skills combined with social justice ideas and human rights themes. The key skills developed in this game relate to: ecology/inclusion, teamwork, health/mental health, career orientation - employability skills that fulfill my life, managing emotions, creativity and the arts, decision



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

making and critical thinking, self-awareness, diversity awareness, communication and empathy, civic behavior, and volunteerism.

### **3. Description, application**

The game has 7 rounds corresponding to the 7 cities conquered on the Hi-Quest journey. CIVIBURG - The city where I become aware of the needs of the community and the planet and develop civic behavior and volunteerism. DECIDOPIA - The city where I learn to make decisions and think critically. DIVERCITY - The city where I become aware of the diversity and uniqueness of all people - learning to appreciate diversity awareness.

EMPATHYVILLE - The city where I can empathize with the people around us - communication and empathy. CREATIVITOWN - The city where I get creative and discover my artistic side - creativity and art. AUTOCONTROLIA - The city where I become aware of my emotions and learn how to control my behavior to be at peace with myself - Emotion Control. REALOPOLIS - The city where I get to know myself better - self-awareness and career orientation.

Each round takes place over two weeks. Put simply, it goes like this: the team arrives in a new city, has one week to complete the mandatory challenge, and another week where team members can decide how many challenges they want to complete from the optional challenges. At the end of the 2 weeks, the team records their accumulated points on the scoreboard and prepares to travel to a new city. If they pass the mandatory challenge, the team members become citizens. If they pass all 5 challenges, they become honorary citizens. If they reflect on the experience in addition to this team, members become ambassadors for their respective cities.

The key role is that of the mentor - the teacher (ideally the principal) who guides the students in exploring all 7 cities.

### **4. Advantages and limitations / limiting factors for application**

- During this period, the main limiting factor has been the pandemic. Since it is a face-to-face game, it could be partially tested but not played for 14 weeks.
- Another limiting factor is the cost of production - the game contains more than 400 cards and other materials, and a box costs 100 euros each.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

- The person coordinating the game plays a key role and must have a certain profile (a person with good facilitation skills) and attitude (empathy, openness to support and self-help, cooperation) for the game to be successful.

#### 5. *An example/illustration*

The game is designed to build skills for people who are part of a group. So it can also be adapted for adult teams and helps to be part of an intensive interactive process and also a problem solving process. The competences are initiated and promoted during 14 weeks and it is challenging to support individuals in their personal development process.

#### 6. *Conclusions (usefulness, impact, knowledge, acceptance, and application in the educational system / process in general and in adult education in particular)*

The game can be used in higher education, but also for students. It needs to be adapted for use by adults who are not involved in an educational process. The game develops a set of skills that are essential for adaptation to the current social context. The provocative nature of the game, determined by the weekly tasks, promotes the development of empathy, self-responsibility, critical thinking and decision-making skills, but also a set of moral-civic skills, knowledge and respect for cultural diversity.

### II.2.19. ICT game-based learning best practices used to build digital competence

The phrase "digital skills" encapsulates a large number of skills that are essential to today's society. The following sections present a subset of these and describe a set of best practices that educators in ICT (or computer science or computational science) are well aware of. These best practices can and must be incorporated into the teaching of other disciplines as well, because digital literacies cut across domains and are the foundation for our development as individuals who need to evolve, move quickly between different tasks, and sometimes take on new jobs in new fields. The Digital Economy and Society Index (DESI) shows that 4 in 10 adults and 1 in 3 professionals in Europe lack basic digital skills. Therefore, educators play a crucial role in improving the digital ecosystem. Practices adopted from computer games are highly appropriate and very effective, as the following paragraphs show.

Among the skills that contribute to the development of digital skills we include: computational thinking, competence in new media, virtual collaboration and transdisciplinarity.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Computational thinking is the ability to translate large amounts of data into abstract concepts and to understand data-based reasoning.

The amount of data we deal with as ordinary citizens and as professionals is increasing exponentially. It is likely that more and more tasks will require computational thinking skills to make use of this data. The use of simulations will become a core competency as simulations are regularly required in discourse and decision making. HR departments, which currently look for experience with basic applications on applicants' resumes, will change their expectations and look for resumes that include statistical analysis and quantitative reasoning skills.

When we talk about computational thinking skills, we need to be aware of their limitations and understand that models are only as good as the data that feeds them. Even the best models are approximations of reality, not reality itself. More importantly, we need to be able to take action even in the absence of data. When algorithms or decision-making systems are not available, creativity must be activated and solutions must be enforced.

New media literacy is the ability to critically evaluate and develop content that uses new forms of media and to use these media for successful communication.

User-generated media has grown tremendously in recent years: Videos, blogs, and podcasts dominate our social lives and will undoubtedly be used in the workplace in the coming decades. The communication tools that enable the shift from static content to new media content will be mandatory.

The next generation of workers will need to master the use and assessment of video, as well as the creation and presentation of visual information with user-friendly production and editing tools.

New media skills must be integrated into all educational programs.

Virtual collaboration is the ability to engage, work productively, and be present as a member of a virtual team.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Today's technologies allow us to share ideas, work, and be productive despite physical separation. However, this requires new skills.

The leader of a virtual group must develop strategies to motivate a distributed group. Virtual team members must be productive and not only overcome isolation, but find a state of well-being for themselves.

*Transdisciplinarity* is the ability to understand and apply concepts across multiple disciplines.

The global problems we face today are very complex and have many facets, requiring specialists from more than one discipline to solve them. While narrow specialization was encouraged in the past, transdisciplinarity is the new trend. New areas of study have emerged that lie at the boundaries of traditional disciplines, and contributions from multiple fields are needed to address a difficult problem.

This type of problem solving has significant implications for the skills people should bring to organizations in the future. Transdisciplinarity goes beyond multidisciplinary teams; it requires researchers who can "speak" the languages of multiple disciplines. The concept of the "T-shaped" worker emerged - this is the specialist who brings a deep understanding of at least one discipline, but also has the ability to converse in the language of a broader range of disciplines. This requires curiosity and a determination to keep learning, well beyond the years of formal training.

Within this framework, we present below a list of ICT-related game-based learning methods that can inspire educators to use them in a variety of contexts. Their applicability knows no limits when creativity is involved. However, they must be adapted and the appropriate tools and apps used to achieve the goals of each activity.

- The basics of numeracy can be taught in fun, low-risk interactive learning environments (such as Scratch).
- Presentation of information is visually stimulated and approached using a variety of new media (e.g., projects developed using social media or microblogging).



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- The creation of collective experiences is always intended (especially those that provide significant social-emotional benefits).
- Smart learning games (with clear objectives, challenges and immediate feedback) are encouraged to develop the competence to engage in large virtual communities.

The formal educational processes, but especially the non-formal and informal activities, aim to arouse students' curiosity and give them the opportunity to learn about different areas of human activity. This gives future specialists the opportunity to engage in complex teams and make their contribution. The field of computer science has the advantage of providing tools for all other fields, so that the development of digital skills is equivalent to the development of transdisciplinary skills.

Initiatives such as the 21st Century Skills Partnership and the Cisco/Intel/Microsoft 21st Century Skills Assessment and Teaching Project also point to the importance of developing creativity and innovation as new ways of thinking. ICT underpins our society and we need to pass on this important information to our students and they need to use it to achieve their goals.

## II.2.20. Theatre Lab OFF BOOK

### 1. Conceptual Delimitations

The Theater Lab is the result of the Erasmus + KA2 project entitled Off Book, 2017-1-LT01-KA201-035235 <http://off-book.pixel-online.org>, in which 8 partners from 3 different European countries participated: Klaipeda University (Lithuania), Pixel Association (Italy), Teatro Stabile di Grosseto (Italy), College of Siena (Italy), Klaipeda Puppet Theater (Lithuania), Klaipeda Simon Dach School (Lithuania), National College of Art "Octav Băncilă" (Romania), EUROED Primary School (Romania). The project underpinned and tested the way in which the Theater Lab - as an experiential education strategy - can be used to develop various key competences at the level of target groups of students and teachers in secondary schools, school leaders and administrators, experts and policy makers in the field of education. In our opinion, the Theater Lab is a good example of multiple gamification, a game within a game, which can be successfully used in adult education because it motivates participants and successfully engages them in an entertaining, self-reflective process. The theater laboratory offers not only a useful leisure activity, but more importantly, the development and improvement of one's own skills, with the dynamics of self-discovery, self-enlightenment and self-improvement.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

2. This approach **contributes to the development of 5 key skills in particular**: 1. communication in the mother tongue; 2. learning to learn; 3. social and civic competence; 4. cultural awareness and expression; 5. entrepreneurial and business skills, without contributing, where appropriate, to the development of foreign language, digital or mathematical communication skills and basic scientific and technological skills.

3. **Description of the approach**: the drama laboratory is a complex approach, a macro-role play that uses dramatic techniques and drama pedagogy. It places people's emotional, cognitive and behavioral components and their creative potential at the center of the process. Theater reveals people's possible attitudes, encourages free expression, relationship management and the ability to respond individually and collectively to stimuli. The OFF -bay-theater-lab represents the space in which individual and collective realization can be cultivated. The identified bibliographic sources highlight a number of steps to be taken in realizing and ensuring the functioning of the theater lab:

- *Setting up the space and sizing the time* in which the activity will take place: physically safe (with no potential hazards or obstacles); wide enough; airy; bright; clean; relatively acoustically and visually neutral. It is also advisable to hold sessions outdoors with attention to only a few details related to the topic. In terms of time, activities with adults can work efficiently for up to 2-2.5 hours, with the number of lab sessions determined/wanted by mutual agreement with the adults of the target group, until the realization of the final performance or not, as the case may be (it is not obligatory for all target groups to propose a final performance! This is NOT the purpose of the lab, the show can only be one of the means!);
- *Determining the target audience* (preferably heterogeneous in terms of age, race, religion, gender identity and even disability - OFF -Book Theater Laboratory works on emotional growth, meeting others, respecting diversity and strengthening alternatives and creativity);
- *Identifying the educational needs of the target audience* (inquiry phase);
- *Organizing/developing lab sessions* (development phase): defining the purpose and goals of the program; text and material selection/preparation; designing, ensuring and complementing the two categories of approaches, mental and physical); selecting/developing icebreaker techniques, exercises, types of theater techniques). Suggested techniques for integration into lab sessions include: Techniques related to physical movement, singing techniques, listening techniques, acting techniques, text work techniques;
- *The final show* or final reflection sessions (feedback phase). If you decide to do a show, it must be written, designed, acted and recorded entirely by the participants, with everyone using their skills,



Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023

competencies, ideas and creativity to create a group product. It can take place either in the lab space or in the form of a performance journey - an unconventional show (as a traveling show or stage theater - there is a sequence of the show at each stop). If a final show is not performed, any other material deemed relevant by the participants to share about the lab experience can be used for feedback: written work, drawings, recordings, reflective journals, anything the participant can leave at the end of the lab as a sign, greeting, word of thanks, message, representation, or photograph. In this context, students have full freedom to express themselves.

4. a. Among the most important **benefits** we include:

1. *the creative capitalization of the pedagogical paradigm of experiential learning* by linking it to the specificities of theater arts, which is used as a formative strategy;
2. *the integration of play* (from role-playing to different theater techniques) and gamification in the laboratory sessions, throughout the activities, which defines the playful nature of this approach;
3. the *accessibility* of the approach to any type of target group (regardless of age, education, living environment, etc.), composed according to the type of needs (integration, stress relief, activation of skills, self-confidence boost, personal development, etc.);
4. the *interdisciplinary dimension*, which affects all categories of competencies that can be developed in laboratory sessions;
5. contributes *significantly to*: free, spontaneous expression; stimulation of initiative; reduction of the tendency to judge others; promotion of creativity; stimulation of group integration; capitalization/stimulation of each participant from the perspective of specific personality aspects (abilities, hobbies, desires, will); development of social and linguistic skills; improvement of the ability to concentrate; acceptance of diversity; reduction of states of tension, sadness, depression, frustration, maladjustment; reduction of emotional and social discomfort;
6. the *superior formative effect* the superior formative effect on all components of personality formation/development and the improvement of various deficit behaviors have led to the use of this type of pedagogical intervention both in the work with students, both formally (from 2020, the theater laboratory was introduced in Romania in the elective subjects of the 10th and 11th grades) and in the teaching of drama to adults.



Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023

4.b. Among the most important **limitations**, some of which even correlate with the advantages and constitute another facet, we include:

1. the *insufficient knowledge* of the educators (teachers, other categories) about the specificities of the experiential paradigm, or the need to train them in this dimension;
2. the *difficulty of changing*, perhaps, *some traditional approaches* in the mentality of some educators regarding theater, its activation in education, its impact on the training / development of adults, the usefulness of non-formal or less common approaches of this type, not intended for students preparing to become actors or specialized categories of (future) professionals in the world of theater;
3. the *interdisciplinary dimension* of the approach requires an *interdisciplinary team* - it is very difficult to have specialists who are fully trained in the two basic aspects of the strategy - experiential education and theater. In addition, it is necessary to cover other aspects of the theater laboratory, such as: diction, music, literature, psychology, technology, computer science;
4. the need to *maintain* the activity of the theater laboratory sessions for a relatively *long period of time* in order to achieve the proposed changes in accordance with the basic needs of the group of beneficiaries, or the risk of some beneficiaries dropping out or abandoning the project;
5. the need for a *dedicated space*, albeit with minimal equipment but with some specificity, to be used only for this purpose, as well as materials and equipment to work on both sets, costumes and final performances;
6. the need for a sufficient budget to cover the costs of space, lighting, heating, materials, internet, payment for sneakers and preparation/performance of final performances;

## 5. Application:

1. *Context description*: a group of adult beneficiaries whose intervention need is the problem of acceptance of diversity, others, otherness (according to different criteria: Age, physical appearance, profession, ethnicity, race, religion, economic status);
2. *description of the structure* of the Theater Lab sessions with the theme of The Stranger:



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

a. *Warm-up activities* (example) - Space ball (adapted from *Improvisation for the Theater* by Viola Spolin, 1999; apud Kobayashi, 2012, p. 31);

b. *Role play* - What do strangers mean to me? - Session participants are asked to answer this question in a variety of ways: physically, in writing, by imitation, by improvisation, by choosing an object, by singing ... alone or in a team;

c. *successive role-plays* followed by reflection and feedback sessions on writing the play *The Stranger*, developing the script and directions, distributing the characters, playing the roles, designing the set and costumes;

d. *successive iterations* of different versions of the play based on improvisation;

e. *reflection and feedback sessions* after each rehearsal;

f. *the development of the final performance*;

3. *a final feedback session* to discuss with members of the target audience the impact on conditions, attitudes and fears of the activities undertaken in the drama lab sessions. Expressive activities include *pantomime play*, to answer the question How did I feel during the Theater Lab sessions? How did I feel during the last performance?

**7. Conclusions:** In accordance with the literature on the subject, we estimate that the theater laboratory proves to be an extremely useful strategy for the education of children, adolescents and adults. For the Romanian educational system it is a very new element, used for the time being only to a small extent in the educational process (optional or informal) and is more a proposal than an actual achievement. It is used only to a small extent in adult education (both because of ignorance of its specificities and because of material and paradigmatic obstacles).

## References

1. Adams, M. (2017). Lessons In Theatre That Have Nothing to Do With Acting. ? Video demonstration TEDx Talks. Retrieved from: <https://www.youtube.com/watch?v=IBsIHZRA2ho>, accesat 3. 10.2021;
2. Bilgin CU, Baek Y, Park H. (2015). How Debriefing Strategies Can Improve Student Motivation and Self-Efficacy in Game-Based Learning. *Journal of Educational Computing Research*. 53(2):155-182. Retrieved from: <https://journals.sagepub.com/doi/10.1177/0735633115598496>, accesat 5.10.2021;



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

3. Clark, R.W., Threeton, M.D. and Ewing, J.C. (2010). The Potential of Experiential Learning Models and Practices In Career and Technical Education & Career and Technical Teacher Education. *Journal of Career and Technical Education*, 25(2), Retrieved from: <https://journalcte.org/article/10.21061/jcte.v25i2.479/>, accesat 6.10.2021;
4. Clevenger, A. D. (2015). Experiential Education as a Framework for Student Affairs' Educator Role. *Journal of Student Affairs*, 24(). Retrieved from <https://commons.erau.edu/publication/209>, accesat 9.10.2021;
5. Damon, W. (2004). What Is Positive Youth Development? The Annals of the American Academy, AAPSS, 591, Retrieved from: <http://faculty.wiu.edu/P-Schlag/articles/What%20is%20Positive%20Youth%20Development.pdf>, accesat 3.10.2021;
6. European Theatre Lab, web site <https://www.europeantheatrelab.eu/openlabs/> accesat 5.10.2021;
7. Gas, M.A., Gillis, H.L., Russel, K.c., (2012) Adventure Therapy: Theory, Research and Practice, New York, NY: Routledge;
8. Giac, C. C., Gai, T. T., & Hoi, P. T. T. (2017). Organizing the Experiential Learning Activities in Teaching Science for General Education in Vietnam. *World Journal of Chemical Education*, 5(5), 180-184, Retrieved from <http://pubs.sciepub.com/wjce/5/5/7/index.html>, accesat 7.10.2021;
9. Grotowski, J. (2002). Towards a Poor Theatre, Routledge, Taylor&Francis Group, New York, Retrieved from: [https://monoskop.org/images/e/e2/Grotowski\\_Jerzy\\_Towards\\_a\\_Poor\\_Theatre\\_2002.pdf](https://monoskop.org/images/e/e2/Grotowski_Jerzy_Towards_a_Poor_Theatre_2002.pdf), accesat 2.10.2021;
10. Harry, R. (2017). Cum educația teatrală poate salva lumea? Video demonstration TEDx Talks, Retrieved from: <https://www.youtube.com/watch?v=Vh2tNfTTbUU>, accesat 10.10.2021;
11. Joseph, G E., Strain, Ph., Yates, T., Hemmeter, M. L. (f.a). Social Emotional Teaching Strategies, Module 2. Retrieved from: <http://csefel.vanderbilt.edu/modules/module2/script.pdf>, accesat 2.10.2021;
12. Kobayashi, D. (2012). Drama Techniques in the EFL Classroom, *Mask & Gavel*, Volume 1, Retrieved from <https://core.ac.uk/download/pdf/80778995.pdf>, accesat 7.10.2021;
13. Litterio, Lisa M. (2014). Teaching Note - The Classroom as the World: Understanding the Value of Experiential Learning. *Bridgewater Review*, 33(2), 33-36. Retrieved from: [http://vc.bridgew.edu/br\\_rev/vol33/iss2/11](http://vc.bridgew.edu/br_rev/vol33/iss2/11), accesat 6.10.2021;



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

14. Lown, J. (2002) Circle Time: The perceptions of teachers and pupils, *Educational Psychology in Practice*, 18:2, 93-102. Retrieved from: <https://www.tandfonline.com/doi/abs/10.1080/02667360220144539>, accesat 6.10.2021;
15. McKenzie, R. (2016). The Value of experiential learning. Show me and I will learn, Retrieved from <http://blog.core-ed.org/blog/2016/05/the-value-of-experiential-learning-show-me-and-i-will-learn.html>, accesat 9.10.2021;
16. Nicholson, S. (2012). Completing the Experience: Debriefing in Experiential Educational Games. In the *Proceedings of The 3rd International Conference on Society and Information Technologies*. Winter Garden, Florida: International Institute of Informatics and Systemics. 117-121. Retrieved from: <https://scottnicholson.com/pubs/completingexperience.pdf>, accesat 29.09.2021;
17. Price, L. (2015). 5 Collaboration or Warm Up Games for the Drama Classroom, Retrieved from: <https://www.theatrefolk.com/blog/5-collaboration-games-for-the-drama-classroom/> accesat 9.10.2021;
18. Sánchez, V. C. (2015). El teatro y la pedagogía en la historia de la educación, *Tonos Digital*, nº 28, Retrieved from: <http://hdl.handle.net/10201/42889>, accesat 9.10.2021;
19. StageMilkTeam (2021). Acting Games, Retrieved from: <https://www.stagemilk.com/acting-games/> accesat 10.10.2021;
20. Suryani, A., Widayastuti, T. (2015). The Role of Teachers' Experiential Learning and Reflection for Enhancing their Autonomous Personal and Professional Development. *Jurnal Sosial Humaniora*, Vol 8, No 1, Retrieved from: <http://iptek.its.ac.id/index.php/jsh/article/view/1239>, accesat 4.10.2021;
21. XXX (2019). Examples of final *OFF-BOOK Theatre Lab* performances, Retrieved from: <https://www.premiogaber.it/gallery.html>, accesat 9. 10.2021;
22. XXX (2017). Teatrul ca metoda de invatare experientiala: procesul de implementare a Laboratoarelor de teatru în sala de clasă, pas cu pas, Retrieved from: [https://off-book.pixel-online.org/files/guidelines/TG03/Guideline\\_RO.pdf](https://off-book.pixel-online.org/files/guidelines/TG03/Guideline_RO.pdf), accesat 29.09.2021;
23. XXX (2017). Exemple Practice de Laboratoare de Teatru, Retrieved from: [https://off-book.pixel-online.org/files/guidelines/TG04/Guideline\\_RO.pdf](https://off-book.pixel-online.org/files/guidelines/TG04/Guideline_RO.pdf), accesat 29.09.2021;
24. XXX (2006). Spaces for learninga review of learning spaces in further and higher education, A report for the Scottish Funding Council prepared by AMA Alexi Marmot Associates in association with haa



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

design. Retrieved from: <http://aleximarmot.com/userfiles/file/Spaces%20for%20learning.pdf>, accesat 3. 10.2021;

25. XXX (f.a.). Leedstie. Retrieved from: <https://leedstie.co.uk/about-us/>, accesat 3. 10.2021;

26. XXX (f.a.). Big Brum theatre in education. Retrieved from: <https://www.bigbrum.org.uk/>, accesat 3. 10.2021;

27. XXX (f.a.): Improv Games and Exercises Online. Retrieved from: <https://spolingamesonline.org/>, accesat 7. 10.2021;

## II.2.21. Integrating the creative arts into the design of teaching - learning - assessment

### 1. Conceptual delineations

The main aim of the project was to combine creativity with innovative learning programs to improve the quality of teaching and learning in all participating schools and raise standards for all pupils, regardless of ability or socio-economic background. We started from the premise that the introduction of creative arts in primary education is a solution to streamline the teaching-learning assessment process and improve student outcomes, improve the school-family relationship and involve parents in school activities.

### 1. Competence - key competences to which application of good practice contributes

As students participated in various creative activities, the following key skills were practised:

- Communication in the mother tongue by teaching students to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing;
- mathematical, scientific and technological literacy, by encouraging students' motivation to acquire specific mathematical knowledge using creative techniques;



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- digital literacy, as demonstrated by the reliable and critical use of information and communication technology to produce creative products;
- learning to learn, as the ability to manage one's own learning effectively, either individually or in groups;
- social and civic competence, as demonstrated by effective and constructive participation in the production of creative products with the help of colleagues.

### **3. Description, application**

In designing the didactic activities, specific elements of creative arts (music, painting, dance, modeling, theater, etc.) were introduced for each lesson of Romanian language, mathematics and science. The most appropriate learning activities were selected, which were related to the theme of the lesson, facilitated learning, contributed to the development of students' creativity and ensured their well-being. Each teacher used different creative techniques in the lessons with their students. Drawing, painting, modeling, collage, drama, fairy tales and therapeutic stories, play, puppets, dance and creative movement, music are some of the techniques used to develop creativity and thus the child's personality. They give the student the security he so desperately needs and the freedom to express and manifest his desires, needs, opinions and attitudes.

#### **1. Advantages and limitations / limiting factors for application**

The benefits of using creative techniques are highlighted in terms of both teacher training and student learning. Skills were developed in teachers to develop an integrated approach to learning and to cross boundaries between disciplines. Teachers were also encouraged to ask questions when designing lessons, which increased the effectiveness of teaching. Another benefit was the constant diversification of the creative techniques used. The use of these techniques has meant that classrooms have been transformed into veritable creative workshops.'

In addition to these benefits, there are also a number of advantages in terms of student learning:



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

- the training of the ability to express themselves in different ways;
- the integration of the creative arts has led to an increase in students' motivation to learn to read and write and to acquire certain mathematical skills;
- improvement of verbal, paraverbal and non-verbal communication;
- increasing the attractiveness of teaching Romanian language and mathematics;
- The possibility of learning more easily by taking advantage of "multiple intelligences";
- Identification of skills;
- Creating cooperation networks between classes;
- Facilitating collaboration and mutual support in the realization of products.

Some benefits can also be seen in terms of parental involvement. Parents participated in various activities with their children, worked together to produce products and in turn were a resource, a support, a role model and a supporter of the child. Fathers helped children make gifts for mothers, families and children built backdrops for exhibitions or designed different spaces in the classroom.

##### **5. An example/illustration of how it can be applied in adult education;**

Students

A specific example that relates specifically to online educational activities is "Digital Applications - Support for Learning and Means to Develop Creativity."

Teachers identified numerous digital applications and various means (mobile phones, tablets, glasses - virtual reality) and used them in their work with students to facilitate learning and develop students' creativity. Plikers, Kahoot, Movie Maker, Paint, Android Painting have become easily familiar to pupils as they respond to children's growing interest in computer activities and contribute to the development of creativity and confidence by giving more freedom to the child and their abilities. Assessment became quick and feedback came immediately with Plikers or Kahoot, fourth graders created their first movies with programs like Moovie Maker, children's talent and imagination were highlighted in works created with applications for painting or drawing.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023***

#### Teachers

The Dâmbovița Teaching Staff House has developed a training program (course support, training materials) that has been submitted to the Romanian Ministry of Education for approval and is made available to teachers in Dâmbovița County. Through the training program, participants will benefit from the best practices identified in the project "Innovation through Creative Arts". They will learn about different ways to streamline learning through the integration of creative arts and learn to ensure student well-being.

## 6. Conclusions

The dissemination of the good practices identified in Wales and Spain was organized in such a way that, at the end of the project, all 1100 teachers in Dâmbovița County received information and participated in training activities to apply the acquired skills in their work with their pupils. The products made by the students in the lessons where the creative arts were introduced were exhibited in different rooms in a conventional or unconventional way. Thus, mini-exhibitions were organized in classrooms, performance halls, school halls, the library and the school garden. Every primary student of the two schools found at least one product made by them in one of the organized exhibitions. They could be admired by older pupils of the school, teachers, parents and visitors of the school and some of them were published on school websites or social networks.

## References

\*\*\* (2016). Project no. 2016-1-UK01-KA201-024296 "Innovation through Creative Arts". Ghid de bune practici. [http://www.isj-db.ro/static/files/proiecte\\_europene/CreativeArts\\_IO4\\_Ghid\\_de\\_bune\\_practici\\_Romania.pdf](http://www.isj-db.ro/static/files/proiecte_europene/CreativeArts_IO4_Ghid_de_bune_practici_Romania.pdf)

### II.2.22. The Labyrinth – role-playing game

#### 1. Conceptual delineations



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

The Labyrinth is a role-playing game structure that can be adapted for use with university students and adults in a variety of disciplines from a variety of fields: classical and modern languages and literatures, philosophy, fine arts, musicology, performing arts, the sciences, and so on. The structure of the game was developed by teachers and researchers from Vasile Alecsandri University of Bacău, Romania, within the Erasmus+ project GameIT: Gamestorming for Innovative Teaching, 2017-2020.

The game is called The Labyrinth. According to the story of the game, there are 2 teams, each team consisting of four characters for four different players: Hero, Advisor, Storyteller, and Guardian. The Guardian is a challenging factor because he is a member of the opposing team. The hero and his team travel through a country (e.g. Romania). As they travel through the maze, they must overcome a series of obstacles in order to progress. By helping each other, they manage to pass through all three levels of the game and exit the maze. The goal of the players is to exit the maze by travelling across the land within a certain time limit. All team members should team up to help the hero reach the exit of the land. They have 45 minutes to overcome all the obstacles.

## **2. Description, application**

At the beginning of the game, each player draws a role/character card under the Gamemaster's supervision (the Gamemaster is the teacher/educator); then they form teams as follows:

*Team 1.* Red Team: Red Hero + Red Advisor + Red Story teller + Blue Guardian

*Team 2.* Blue Team: Blue Hero + Blue Advisor + Blue Story teller + Red Guardian

Before the game starts, each player presents his/her character by reading what is written on the role card.

The roles on the cards contain a brief description of the character and the actions that each player can perform, for example: the Hero is assertive, he/she initiates and maintains discussions and negotiations. He/she is passionate, altruistic, honest and peace-loving. He/she loves and protects animals and nature. He/she is a traveler, an explorer, with good diplomatic skills. The Hero draws the Labyrinth map (a set of cards) with tasks. To solve each task, he/she performs one of the following actions, depending on what is available for the task: 1. He/she solves the task all by himself/herself; 2. He/she asks the Advisor for



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

resources; 3. He/she finds the answer by solving a riddle of the Guardian; 4. He/she finds the answer on the map; 5. He/she searches the Internet for clues to solve the task.

The map of the maze consists of a series of different tasks that the Hero must solve in order to receive permission from the Guardian to advance to the next level, such as: quiz-like questions; tasks involving writing and telling a story; riddles; describing a food recipe; performing a fragment from a folk dance; performing a fragment from a song; searching for clues on a map; finding the answer using clues; solving a puzzle.

The maze consists of 3 levels, each containing 6 tasks of increasing difficulty. At the end of each level, at the starting point, the Story teller and his team must make up a story and tell it to the Guardian. After hearing the story, the Guardian allows them to exit that level and begin the next level of the maze.

Before starting the next level, the players switch roles by drawing different role cards under the Gamemaster's supervision.

The Hero enters the Labyrinth with 1 LEU and may only buy 1 answer throughout the game. The Hero is rewarded by the Guardian with 1 LEU (Romanian currency) for each task he solves all by himself (i.e. without resources from the Advisor, puzzles, map or internet).

The Advisor is in possession of the Book of Resources and provides the Hero with resources at the Hero's request. The Advisor may not give the Hero the answer, but will help the Hero solve/perform any tasks. The Guardian owns the treasure chest and the riddles, and can only sell the hero 1 answer throughout the game. The Guardian also has some money to reward the hero. The Guardian also keeps track of the total time the hero has to leave all 3 levels of the maze to finish the game: 45 minutes. Using information technology devices to find the answers to the tasks is only allowed for the tasks where it is mentioned. It is prohibited for the rest of the tasks.

The game ends when one of the teams is the first to leave the maze, having overcome all the obstacles of the 3 levels. The game also ends when the 45 minute time limit for the game has expired, regardless of whether the teams have completed all 3 levels and exited the maze. There are two versions of the game:

Version 1: a game for 2-4 players, with no competing team and no competitive element; the game ends either when the 45-minute time limit is up, or when players exit the maze;

Version 2: a game for 6-8 players, where two teams are formed and compete to exit the maze first.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

### 3. Competence - key competences to which application of good practice contributes

This role-play has the following learning goals:

Goal 1: Students will increase their knowledge in a particular area (in our case, cultural knowledge);

Goal 2: Students will practice and develop communication skills in English;

Goal 3: Students will practice and develop soft skills: leadership skills: e.g. decision making, team communication, negotiation; management skills: e.g. time prioritization, interpersonal skills, communication, financial management;

Goal 4: Students will practice and develop skills related to intercultural awareness: shifting perspectives, observation, empathy, decision making, practical and effective action.

The tasks may be adapted and modified to fit the content of a particular subject (language practice - grammar, vocabulary, literature, philosophy, logic, ethics, etc.).

Objective O4 refers to building a framework that enables educators from different humanities disciplines to better understand the advantages and disadvantages of games and simulations for their pedagogical goals.

### 4. Advantages and limitations / limiting factors for application

In terms of benefits, the literature review revealed relevant effectiveness of games at cognitive, affective and behavioral levels.

At the affective level, games: promote positive attitudes towards learning; engage all students in a class in active learning and keep them motivated; provide some level of satisfaction (Ritzhaupt et al. 2014; Tseklevs et al. 2014; Fu et al. 2016; Carenys & Moya 2016).



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

At the behavioral level, games connect learners and help them construct self-constructed learning; support experiential learning; provide a framework for collaborative learning, interactivity and feedback between players; and promote social and interpersonal skills (Young et al. 2012; Girard et al. 2013; Merchant et al. 2014; Anderson et al. 2009; Whitton 2012; Cojocariu & Boghian 2014).

At the cognitive level, some studies show that the use of games is not effective in learning (Young et al. 2012; Girard et al. 2013; Merchant et al. 2014), while others argue that games enhance the acquisition of learning content and the consolidation of previously acquired knowledge (Peng 2009; Suh, Kim & Kim 2010; Nishikawa & Jaeger 2011; Arnab et al. 2013; Badea 2015). Moreover, it is generally accepted that games promote higher cognitive skills and operations such as memory, retention, attention, logic, abstraction, generalization, analysis and synthesis, comparison, systematization, particularization, and creativity.

The disadvantages of using games in education include: game-based learning can be time-consuming and time management can be difficult during the game; the risk that students/players may consider the game activity as mere entertainment and devote themselves to it with less responsibility and seriousness, or that they may not recognize the learning objective; the difficulty of recognizing the knowledge acquired by students, and possible errors/gaps in assessment.

## **5. An example/illustration of how it can be applied in adult education**

The role-playing game The Labyrinth can be used in adult education as such, or the tasks that players must complete to document their progress can be replaced with tasks from different areas (art, music, drama, personal development, parenting, etc.).

## **6. Conclusions**

In summary, regarding the advantages and disadvantages of using games in the classroom, game-based learning is a type of game with clearly defined learning outcomes: It combines the learning material with the game and the player's ability to retain and apply the learning material to the real world in a balanced way; it is approached in terms of pedagogical method, didactic approach and organization of



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

the teaching-learning activity. Modern theories of effective learning have shown that learning is most effective when it is active, experiential, situated, problem-based, and provides immediate feedback; games have all of these characteristics (Connolly et al. 2012; Popescu 2014). Team-based games help build communication and relationship skills: Players work face-to-face to answer questions or solve problems, and find that by working together they are better able to find and implement solutions more quickly. Board games are a great way to make players/adults aware of the strengths of collaboration. In companies, this awareness can actually change working relationships for the better (Elizabeth Treher 2011: 4).

## II.2.23. Walking Tour

### 1. Conceptual delineations

Based on the concept of educational trails, which are a popular tool for nature-based education, a Hungarian team came up with the idea of creating similar educational trails in cities using IT. These trails are focused on specific themes and lead through the cities, so that after completing these trails, visitors have a deeper connection with the city, which can have visible impacts on their well-being, environmentally conscious behaviour, civic activities, etc.

### 2. Competence - key competences

Communication, problem solving, cooperation skills, orientation, observation, creativity

### 3. Description, application

Participants work in teams of 5 or 6. In the frame story, there is a character called Geowarrior who has a Facebook profile and is the leader of the students. Geowarrior is the same age as the participants, so they can feel closer to him. They communicate with him and send him selfies to prove that they have visited the specified places on the trail. The participant's phone shows where the next location is using the Sighter app, or it can also be checked from a computer or tablet in Prezi with a map and pictures. For each location on the trail, there are specific questions about the chosen topic that participants can answer in Redmenta. The questions are provided by Geowarrior, who also keeps a leaderboard of players up to date. There are rewards for certain tasks and at the end of the path, Geowarrior provides them with a puzzle that shows



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

a QR code when solved. The QR code leads to a website where they can post their pictures about the adventure and sign their name on a fame board. They will also receive a voucher that they can exchange for free cookies or ice cream at the local pastry shop.

#### 4. Advantages and limitations / limiting factors for application

Advantages: contributes to the development of numerous competencies and skills, provides a memorable and great experience, is healthy as the activity is done on foot, helps participants explore a city that may be new to them, and they can learn about their surroundings. Requires teamwork.

Disadvantages: Requires teamwork. Team members may come into conflict. You need the necessary tools and a lot of preparation.

#### 5. Conclusions

This is a very flexible method in terms of target groups and topics. It can be used to guide the freshmen of a university (who have just moved to the capital from the countryside, for example) around the city, show them important places that will play a big role in their university life, etc. It can also be used in trainings and any other formal or informal form of adult education, but getting the tools and setting them up requires a lot of resources.

<https://folyoiratok.oh.gov.hu/uj-pedagogiai-szemle/gamifikacio-jatekositas-es-pedagogia>

### II.2.24. Digital storytelling with LEGO

#### 1. Conceptual delineations

There are countless best practices for teaching literature, but this method takes into account the fact that digital tools and their use play a huge role in our everyday lives. Through the methods of gamification and digital storytelling, we can introduce the use of LEGO tools into educational environments. The most famous examples of schools using these methods are from Denmark.

#### 2. Competence - key competences

Communication competence, creativity, social skills, emotional skills, cognitive skills



*Erasmus+ KA2, GAME-ED: Development of creativity skills by game-based learning methods in adult education, 2020-1-HU01-KA227-ADU-094052, 2021-2023*

### **3. Description, application**

The model is based on a holistic approach to learning which states that there are 4 aspects of a learning process (The 4C):

Connect: we should base the tasks on the curiosity of the students.

Construct: If we design the task so that students can gain experience, they will learn by doing the task.

Contemplate: If they can summarize what they have learned and draw a conclusion, they will understand the topic better and their ability to ask constructive questions will also be improved.

Continue: We apply the freshly learned skills and information to a new task.

Playing with LEGO develops many skills such as spatial vision, visual search, visual perception, flexible thinking, short-term memory, imitation, self-knowledge, patience, etc.

### **4. Advantages and limitations / limiting factors for application**

Advantages: creates a fun experience, helps develop many skills, encourages teamwork, they have to work in teams which helps improve their skills and motivates everyone to participate. There are no limits (except our creativity), can be used many hours in a row to develop a story, can be used to prepare students for real life situations.

Disadvantages: time consuming, you need tools (IT and LEGO), you need a prepared teacher/coach, it might be difficult to handle groups of students working on it. It might be difficult to motivate everyone to participate. There might be conflicts in the teams.

### **5. An example/illustration**

The LEGO StoryStarter is a special learning tool designed for classroom use that contains unique elements. Using the pieces, students can recreate real-life situations or stories from books and capture them using tools from IT, such as making a stop-motion LEGO movie.

### **6. Conclusions**

This method uses certain approaches that could be transformed and used in adult education and skills development.



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

[http://real.mtak.hu/130850/1/LEGO\\_Digitalis\\_tortenetmeseles.pdf](http://real.mtak.hu/130850/1/LEGO_Digitalis_tortenetmeseles.pdf)

## II.2.25. Escape rooms

### 1. Conceptual delineations

Arany-Nagy Zsuzsanna researched the use of gamification in high school history and literature classes. She found that creating a template with variations of classic lectures and gamified assignments that lead to an "Escape Room"-like challenge at the end to summarize the material is extremely effective. This method can be used in many different education/training scenarios.

### 2. Competence - key competences

Communication, team working skills, learning how to learn, social skills, leadership skills, digital competence, cultural knowledge, creativity, problem solving, decision making

### 3. Description, application

First of all, we need to teach the students the main pillars of our concept in the chosen teaching method, which we can always spice up with more and more interactive tasks. In this step, we can explain to them our starting point, the basis of the concept we will build on. Using creative methods, we can give them tasks related to our topic that they have to solve in teams. In this way, they will learn all the important information and skills related to this topic. In the second step, to summarize what they have learned, we can create an Escape Room with tasks related to our topic. These challenges can be based on finding missing information, making connections between information, checking how well they know the information they had to learn, etc. We can use digital tools such as smartphones, QR codes, etc. to make it more exciting.

For example, in a history class, we can teach the students about the events of WW2 and set up an Escape Room based on a specific WW2 location. In the first phase, they have to find out the name of a general from letters. Once they have done that, they get the next "key", which can be an envelope with a QR code to an online quiz where they have to reach a certain score to get the next "key", and so it goes on. The fun experiences help them memorize the material even if they have not learned it yet.

### 4. Advantages and limitations / limiting factors for application



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

**Advantages:** can be used with many different topics and scenarios for different audiences. Develops a wide range of skills and competencies. A memorable, fun experience that helps students internalize the skills and knowledge. Requires them to work in teams, which helps improve their social and cooperative skills and motivates everyone to participate.

**Disadvantages:** It might be difficult to motivate everyone to participate. There may be conflict within the teams. Requires a lot of preparation. Time consuming. Requires tools.

## **5. Conclusions**

It can be a good method in adult education and skill development, but it needs proper structure and a lot of work to do it effectively.

<https://tmt.omikk.bme.hu/tmt/article/view/12374/14089>

## II.2.26. The Big Book Initiation

### **1. Conceptual delineations**

The event was organized by the Hungarian Libraries in 2015 and aimed at making the use of libraries a social activity, proving that reading is not a solitary activity, and giving participants the opportunity to join a community where they can feel comfortable and have fun together, help each other learn, recommend books and share experiences.

### **2. Competence - key competences**

Communication, cooperational skills, digital competencies, creativity

### **3. Description, application**

The participants were divided into groups, given a list of books by classical/contemporary, Hungarian/foreign authors. They had to choose books from the list, read them and then present a creative book recommendation to the other groups, which they had to create together. After that, they had to come up with creative tasks for a selected book, such as designing a cover, creating a montage from the book's story, etc. In this event, students not only read interesting books, but they also had to transform



Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023

their experiences to present them to others in an exciting and entertaining way. They experienced what it feels like to be a teacher and create exciting assignments on certain topics that they teach students by solving them. They also received grades for their presentations, the games and assignments they created, and the teams with the highest grades received rewards at the end.

#### 4. Advantages and limitations / limiting factors for application

Advantages: Motivates participants to read, develops their communication, presentation and general language skills, contributes to their creativity, general knowledge and grammar skills. Develops their collaboration, project management and time management skills.

Disadvantages: difficult to organize, requires a lot of time to complete.

#### 5. Conclusions

It is a good example to show students other perspectives. In this way they can learn more about the selected books and about themselves. An entire course can be built on this method, with each team accumulating points for each assignment during the semester, and members receiving their final grade based on the points earned by their team. A revised form of this method could be used in adult education. However, since adult learners have less free time, the method should be adapted to their needs and circumstances, e.g. scientific news, theories, etc. can be used instead of books.

<https://tmt.omikk.bme.hu/tmt/article/view/12374/14089>

<https://nagykonyvesbeavatas.hu/hu/node/446>

### III. Conclusions

The best practices of game-based learning presented in this collection focus on building 21st century competencies and skills. There are a variety of interactive teaching methods. However, the challenge has been to identify, select, and present methods that place a strong focus on activating the mental processes associated with creativity: analytical and critical thinking; imagination; sourcing, reorganizing, and restructuring information; generating new ideas and products; transforming outdated products into new, innovative ones; giving new shape and form to old but useful resources.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

This collection of methods for fostering creativity in adult education is aimed at adult educators and adult learners, as well as all current and future educators/trainers at all levels of education who work with all ages of learners in a variety of activity settings. This is because the methods presented in this document share another important characteristic, flexibility. The methods in this collection are adaptable to any educational setting and can be tailored to meet the needs of learners of all ages. However, the focus of this collection is on the application of these methods in adult education.

## References

Adams, M. (2017). Lessons In Theatre That Have Nothing to Do With Acting. ? Video demonstration TEDx Talks. Retrieved from: <https://www.youtube.com/watch?v=IBsIHZRA2ho>, October 3<sup>rd</sup>, 2021.

Árvai-Homolya, Szilvia és Lengyelne Szilágyi, Szilvia és Osváth, Andrea (2018). *Játzsza tanulás innovatív, LEGO alapú logikai készségfejlesztő foglalkozások keretében = Learning by playing based on innovative, logical skills developing lesson using lego*. GRADUS, 5 (2). pp. 264-269. ISSN 2064-8014.

Bajka, G. Gaming in adult education: expectations versus reality. Retrieved from <https://epale.ec.europa.eu/en/blog/gamification-adult-learning-expectations-vs-reality>. September 29th, 2021.

Balogh, A. (2017). Digital games in education. 10. DOI: 10.21030/anyp.2017.1.5.s

Bilgin, C.U., Baek, Y., Park, H. (2015). How Debriefing Strategies Can Improve Student Motivation and Self-Efficacy in Game-Based Learning. *Journal of Educational Computing Research*. 53(2):155-182. Retrieved from: <https://journals.sagepub.com/doi/10.1177/0735633115598496>, October 5<sup>th</sup>, 2021.

Bónus L., NagY, L. Development of research skills with the game method. Retrieved from [http://publicatio.bibl.u-szeged.hu/21211/1/MS-9402\\_MTA\\_biológia\\_07.pdf](http://publicatio.bibl.u-szeged.hu/21211/1/MS-9402_MTA_biológia_07.pdf) . September 29th, 2021.

Brčić Petek, T. (2016). IGRA VLOG KOT METODA IZKUSTVENEGA UČENJA PRI JEZIKOVNEM POUKU SLOVENŠČINE (Role-playing as a Method of Experiential Learning in Slovenian Language Teaching) – Master thesis. Retrieved from <https://dk.um.si/Dokument.php?id=107410>, October 10<sup>th</sup>, 2021.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

- Brezavšček, A., & Minič, M. (2020). Izboljšanje ozaveščenosti na področju informacijske varnosti z uporabo metod igrifikacije. *Uporabna nformatika*, 28(2). Retrieved from <https://212.235.189.237/index.php/ui/article/view/92>, Spetember 27<sup>th</sup>, 2021.
- Carbonaro, M., Szafron, D., Cutumisu, M., Schaeffer, J. (2010). Computer-game construction: A gender-neutral attractor to computing science. *Computers & Education*, 55(3), 1098–1111.
- Črnič, N., & Golob, U. (2018). Igrifikacija v storitvenem marketingu: uvajanje elementov iger v proces spletnega nakupa letalskih kart. *Akademija MM*, 13(27), 49-63.
- Clark, R.W., Threeton, M.D., Ewing, J.C. (2010). The Potential of Experiential Learning Models and Practices In Career and Technical Education & Career and Technical Teacher Education. *Journal of Career and Technical Education*, 25(2), Retrieved from: <https://journalcte.org/article/10.21061/jcte.v25i2.479/>, October 6<sup>th</sup>, 2021.
- Clevenger, A. D. (2015). Experiential Education as a Framework for Student Affairs' Educator Role. *Journal of Student Affairs*, 24(). Retrieved from <https://commons.erau.edu/publication/209>, October 9<sup>th</sup>, 2021.
- Damian, A.; Gavriloiu, A.; Stinga, C.; Misu, P. (2007). Ghidul animatorului socio-educativ. [A Guide for socio-educational entertainers]. București: Asociația CREATIV. Available at <https://bibinfdoc.files.wordpress.com/2013/12/ghidul-animatorului-socioactiv.pdf>. Retrieved, October 10<sup>th</sup>, 2021.
- Damon, W. (2004). What Is Positive Youth Development? The Annals of the American Academy, AAPSS, 591, Retrieved from: <http://faculty.wiu.edu/P-Schlag/articles/What%20is%20Positive%20Youth%20Development.pdf>, October 3<sup>rd</sup>, 2021.
- Drgan, M. (2020). *Vpeljava mehanizmov igre v modele poslovanja na spletu* (Doctoral dissertation, Univerza v Ljubljani, Fakulteta za družbene vede).
- Duchon, J. (2021). Comparison of learning style and play type in adults to play the educational process. In: "Talent, Diligence, Profession": Study Volume. Hungarian Law Enforcement Association Customs and Finance Department, Budapest, pp. 223-235.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Dumitrescu, V.; Covaci, M.; Popescu, A. (2009). *Laboratorul de educație nonformală ; Culegere de metode și instrumente [Laboratory of nonformal education ; Methods and tools]*. București : Agenția Națională pentru Programe Comunitare In Domeniul Educației și Formării Profesionale. Available at <https://learningforchange.net/ro/knowledge-base/culegere-de-metode-si-instrumente-non-formale/>. Retrieved, October 10th, 2021.

EPALE (2020): „How much gaming does education need?” – Interview: a game designer’s perspective on gamification in (adult) education. Retrieved from <https://epale.ec.europa.eu/en/blog/wieviel-game-braucht-education>, September 25th, 2021.

European Theatre Lab, web site <https://www.europeantheatrelab.eu/openlabs/>, October 5<sup>th</sup>, 2021.

Faiella, F., & Ricciardi, M. (2015). Gamification and learning: a review of issues and research. *Journal of e-Learning and Knowledge Society*, 11(3).

Gadoularov, O.; Romanică, B. (2006). Manual. Formarea formatorilor. Folosirea educației non-formale și a metodelor interactive în lucrul cu tinerii [Manual. Training of Trainers. Using Non-Formal Learning and Interactive Methods in Youth Work]. Educație non-formală pentru angajabilitate/Non-formal learning for employability. Project: 2014-1-BG01-KA205-001743. Available at <https://educativpgm.files.wordpress.com/2013/02/manual-tot-ro-online.pdf> . Also, English version [https://www.salto-youth.net/downloads/toolbox\\_tool\\_download-file-1493/Manual%20TOT%20EN%20Online.pdf](https://www.salto-youth.net/downloads/toolbox_tool_download-file-1493/Manual%20TOT%20EN%20Online.pdf). Retrieved, October 10th, 2021.

Gas, M.A., Gillis, H.L., Russel, K. C., (2012). *Adventure Therapy: Theory, Research and Practice*, New York, NY: Routledge.

Giac, C. C., Gai, T. T., Hoi, P. T. T. (2017). Organizing the Experiential Learning Activities in Teaching Science for General Education in Vietnam. *World Journal of Chemical Education*, 5(5), 180-184, Retrieved from <http://pubs.sciepub.com/wjce/5/5/7/index.html>, October 7<sup>th</sup>, 2021.

Grotowski, J. (2002). *Towards a Poor Theatre*, Routledge, Taylor&Francis Group, New York, Retrieved from: [https://monoskop.org/images/e/e2/Grotowski\\_Jerzy\\_Towards\\_a\\_Poor\\_Theatre\\_2002.pdf](https://monoskop.org/images/e/e2/Grotowski_Jerzy_Towards_a_Poor_Theatre_2002.pdf), October 2<sup>nd</sup>, 2021.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Harangi-Tóth, Z. Game-based education at the university. <https://belugyiszemle.hu/hu/node/788>. September 29<sup>th</sup>, 2021.

Harry, R. (2017). Cum educația teatrală poate salva lumea? Video demonstration TEDx Talks, Retrieved from: <https://www.youtube.com/watch?v=Vh2tNfTTbUU>, October 10<sup>th</sup>, 2021.

JEDRINOVIĆ, Sanja, LUŠTEK, Anja, BEVČIČ, Mateja, ERJAVŠEK, Martina, LOVŠIN KOZINA, Francka, KOSTANJEVEC, Stojan. The usability of the educational computer game for nutrition education. V: [Conference programme & abstract book]. GlobETS: An International Conference on Education, Technology and Science, May 6 - 9 May, 2018, Belgrade, Serbia. [S. l.]: [s. n.], 2018. Str. 40. [COBISS.SI-ID 12014921]

Joseph, G E., Strain, Ph., Yates, T., Hemmeter, M. L. (f.a). Social Emotional Teaching Strategies, Module 2. Retrieved from: <http://csefel.vanderbilt.edu/modules/module2/script.pdf>, October 2<sup>nd</sup>, 2021.

Kafai, Y. (2012). *Minds in Play*. Hoboken, NJ: Taylor and Francis.

Kobayashi, D. (2012). Drama Techniques in the EFL Classroom, *Mask & Gavel*, Volume 1, Retrieved from <https://core.ac.uk/download/pdf/80778995.pdf>, October 7<sup>th</sup>, 2021.

KOSTANJEVEC, Stojan, ERJAVŠEK, Martina, JEDRINOVIĆ, Sanja, BEVČIČ, Mateja, LUŠTEK, Anja, LOVŠIN KOZINA, Francka. Development of an educational computer game for nutrition education. V: Abstract and conference materials. 11th European Conference on Games Based Learning, FH Joanneum, University of Applied Sciences, Graz, Austria, 5-6 October 2017. Reading: Academic Conferences and Publishing International, cop. 2017. Str. 43. Proceedings of the ... European conference on games-based learning (Print). ISBN 978-1-911218-56-2. ISSN 2049-0992. [COBISS.SI-ID 11783497]

KOSTANJEVEC, Stojan, ERJAVŠEK, Martina, JEDRINOVIĆ, Sanja, BEVČIČ, Mateja, LUŠTEK, Anja, LOVŠIN KOZINA, Francka. Development of an educational computer game for nutrition education. V: PIVEC, Maja (ur.), GRÜNDLER, Josef (ur.). Proceedings of the 11th European Conference on Games Based Learning : FH Joanneum, University of Applied Sciences, Graz, Austria, 5-6 October 2017. Reading: Academic Conferences and Publishing International Limited, cop. 2017. Str. 343-351, ilustr., tabele. ISBN 978-1-911218-57-9. [COBISS.SI-ID 11784009]



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Litterio, L. M. (2014). Teaching Note - The Classroom as the World: Understanding the Value of Experiential Learning. *Bridgewater Review*, 33(2), 33-36. Retrieved from: [http://vc.bridgew.edu/br\\_rev/vol33/iss2/11](http://vc.bridgew.edu/br_rev/vol33/iss2/11), October 6<sup>th</sup>, 2021.

Lévai, D. Gamification. <https://tka.hu/nemzetkozi/6575/jatekositas>. September 29<sup>th</sup>, 2021.

Lown, J. (2002) Circle Time: The perceptions of teachers and pupils, *Educational Psychology in Practice*, 18:2, 93-102. Retrieved from: <https://www.tandfonline.com/doi/abs/10.1080/02667360220144539>, October 6<sup>th</sup>, 2021.

McKenzie, R. (2016). The Value of experiential learning. Show me and I will learn, Retrieved from <http://blog.core-ed.org/blog/2016/05/the-value-of-experiential-learning-show-me-and-i-will-learn.html>, October 9<sup>th</sup>, 2021.

Mrak Merhar, I., Klara Vidmar, K., Lucija Umek, L. USING PLAY IN ANDRAGOGICAL PROCESSES. Retrieved from [https://issuu.com/drustvomladinskiceh/docs/uporaba\\_igre\\_v\\_andragoskih\\_procesih](https://issuu.com/drustvomladinskiceh/docs/uporaba_igre_v_andragoskih_procesih), October 8<sup>th</sup>, 2021.

Mrak Merhar, I., Umek, L., Jemec, J., Remik, P. DIDAKTIČNE IGRE IN DRUGE DINAMIČNE METODE (DIDACTIC GAMES AND OTHER DYNAMIC METHODS). Retrieved from [https://issuu.com/drustvomladinskiceh/docs/didakticne\\_igre\\_in\\_druge\\_dinamicne](https://issuu.com/drustvomladinskiceh/docs/didakticne_igre_in_druge_dinamicne), October 7<sup>th</sup>, 2021.

Nagy, S. és Molnárné, C. K. (2019) „A játékosítás (gamification) mint a digitális oktatási innováció egyik eszköze - A SimBrand szoftver esete”, *Marketing & Menedzsment*, 53(2), o. 55–68. doi: 10.15170/MM.2019.53.02.05.

Neagu, M. (coord.). (2010). *Curriculum Teatru Forum. Ateliere practice pentru dezvoltarea abilităților de viață la tinerii ce aparțin unor grupuri dezavantajate [Curriculum Forum Theatre. Workshops for building life skills at vulnerable youth]*. București: Asociația A.R.T Fusion. Available at [https://artfusion.ro/wp-content/uploads/2020/12/Curriculum-TF\\_ART.pdf](https://artfusion.ro/wp-content/uploads/2020/12/Curriculum-TF_ART.pdf). Retrieved, October 10<sup>th</sup>, 2021.

Németh, G., Doktor, A. Possibilities for the development of social competence in school. Retrieved from <https://folyoiratok.oh.gov.hu/uj-pedagogiai-szemle/a-szocialis-kompetencia-fejlesztesenek-lehetosegei-az-iskolaban>. September 29<sup>th</sup>, 2021.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Nicholson, S. (2012). Completing the Experience: Debriefing in Experiential Educational Games. In the *Proceedings of The 3rd International Conference on Society and Information Technologies*. Winter Garden, Florida: International Institute of Informatics and Systemics. 117-121. Retrieved from: <https://scottnicholson.com/pubs/completingexperience.pdf>, September 29<sup>th</sup>, 2021.

Organizația Națională Cercetașii României. (2013). Manualul 100 de idei de educație nonformală [Handbook of 100 ideas of nonformal education]. București. Available at <https://www.scout.ro/wp-content/uploads/2013/10/Manual-100-de-idei-de-educatie-non-formala.pdf>. Retrieved, October 10<sup>th</sup>, 2021.

Price, L. (2015). 5 Collaboration or Warm Up Games for the Drama Classroom, Retrieved from: <https://www.theatrefolk.com/blog/5-collaboration-games-for-the-drama-classroom/>, October 9<sup>th</sup>, 2021.

Qian, M., & Clark, K.R. (2016). Game-based learning and 21st century skills: A review of recent research. *Computers in Human Behavior*, 63, 50–58.

Rogers, Y., & Scaife, M. (1998). How can interactive multimedia facilitate learning? In J. Lee (Ed.), *1st International Workshop On Intelligence and Multimodality in Multimedia Interfaces. Research and Applications* (pp. 1–25).

Seaborn, K., El-Nasr, M.S., Milam, D., & Young, D. (2012). Programming, PWNed: Using digital game development to enhance learners' competency and self-efficacy in a high school computing course. In *Proceedings of the 43rd ACM technical symposium on computer science education* (pp. 93–98). New York, NY: ACM.

Spieler, B., & Slany, W. (2018). *Game development-based learning experience: Gender differences in game design*. Paper presented on 12th European Conference on Games Based Learning, France.

Sánchez, V. C. (2015). El teatro y la pedagogía en la historia de la educación, *Tonos Digital*, nº 28, Retrieved from: <http://hdl.handle.net/10201/42889>, October 9<sup>th</sup>, 2021.

Škapin-Rugelj, M., Rugelj, J. (2021), *Gamification in the study of mathematics for engineering students*. In: *Proceedings. Brussels: European Society for Engineering Education (SEFI)*, pp. 57-62. ISBN 978-2-87352-022-9.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

Sillaots, M. (2014, October). Achieving flow through gamification: a study on re-designing research methods courses. In *European Conference on Games Based Learning* (Vol. 2, p. 538). Academic Conferences International Limited.

Sillaots, M. (2016). *Creating the flow: the gamification of higher education courses*. Tallinn University.

Špehar, S. (2018). Aplikacija za gamifikacijo mobilnega učenja (Gamified mobile learning application) – Bachelor thesis, Retrieved from [http://eprints.fri.uni-lj.si/4041/2/Aplikacija\\_za\\_gamifikacijo\\_mobilnega\\_u%C4%8Denja.pdf](http://eprints.fri.uni-lj.si/4041/2/Aplikacija_za_gamifikacijo_mobilnega_u%C4%8Denja.pdf), September 27th, 2021.

StageMilkTeam (2021). *Acting Games*, Retrieved from: <https://www.stagemilk.com/acting-games/>, October 10<sup>th</sup>, 2021.

Stanković Elesini, U., Hlede, M., Kristan, D., Korošec, A., Vrabič Brodnjak, U., Rugelj, J. (2021) *Mobile game for enhancing visitors' experience in a museum* (submitted for publication).

Suryani, A., Widyastuti, T. (2015). The Role of Teachers' Experiential Learning and Reflection for Enhancing their Autonomous Personal and Professional Development. *Jurnal Sosial Humaniora*, Vol 8, No 1, Retrieved from: <http://iptek.its.ac.id/index.php/jsh/article/view/1239>, October 4<sup>th</sup>, 2021.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Zapušek, M., & Rugelj, J. (2014). Achieving teachers' competences in the serious game design process. In *Proceedings of 8th European Conference on Games Based Learning*: Vol. 2 (pp. 662–665). Academic Conferences International Limited, Reading.

Zapušek, M., & Rugelj, J. (2021). *Game Design-Based Learning for Preservice and in-Service Teacher Training*. In *Technology Supported Active Learning* (pp. 165-186). Springer, Singapore.

Zoltán Kenyeres, A. Development of communication competence. Retrieved from [http://www.biharinepfoiskola.hu/kompetencia\\_eu/page.php?30](http://www.biharinepfoiskola.hu/kompetencia_eu/page.php?30). September 29th, 2021.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

XXX (2019). Examples of final *OFF-BOOK Theatre Lab* performances, Retrieved from: <https://www.premiogaber.it/gallery.html>, October 9<sup>th</sup>, 2021.

XXX (2017). Teatrul ca metoda de invatare experientiala: procesul de implementare a Laboratoarelor de teatru în sala de clasă, pas cu pas, Retrieved from: [https://off-book.pixel-online.org/files/guidelines/TG03/Guideline\\_RO.pdf](https://off-book.pixel-online.org/files/guidelines/TG03/Guideline_RO.pdf), September 29<sup>th</sup>, 2021.

XXX (2017). Exemple Practice de Laboratoare de Teatru, Retrieved from: [https://off-book.pixel-online.org/files/guidelines/TG04/Guideline\\_RO.pdf](https://off-book.pixel-online.org/files/guidelines/TG04/Guideline_RO.pdf), September 29<sup>th</sup>, 2021.

XXX (2006). Spaces for learning. A review of learning spaces in further and higher education, A report for the Scottish Funding Council prepared by AMA Alexi Marmot Associates in association with haa design. Retrieved from: <http://aleximarmot.com/userfiles/file/Spaces%20for%20learning.pdf>, October 3<sup>rd</sup>, 2021.

XXX (f.a.). Leedstie. Retrieved from: <https://leedstie.co.uk/about-us/>, October 3<sup>rd</sup>, 2021.

XXX (f.a.). Big Brum theatre in education. Retrieved from: <https://www.bigbrum.org.uk/>, October 3<sup>rd</sup>, 2021.

XXX (f.a.): Improv Games and Exercises Online. Retrieved from: <https://spolingamesonline.org/>, October 7<sup>th</sup>, 2021.

\*\*\* (2016). Project no. 2016-1-UK01-KA201-024296” Innovation through Creative Arts”. Ghid de bune practici. [http://www.isj-db.ro/static/files/proiecte\\_europene/CreativeArts\\_IO4\\_Ghid\\_de\\_bune\\_practici\\_Romania.pdf](http://www.isj-db.ro/static/files/proiecte_europene/CreativeArts_IO4_Ghid_de_bune_practici_Romania.pdf), October 10<sup>th</sup>, 2021.

\*\*\*MegaVET “Move to Enhance the Gamified Applications in Vocational Education Training” Project (a book about gamification and about the android application). <https://www.sc-nm.si/sestg/megavet/megavet-book.pdf>. October 25<sup>th</sup>, 2021.

\*\*\*LEVEL UP! Designing game-based practices for migrant children inclusion. Retrieved from <https://www.levelup4inclusion.eu/mooc/>. October 4<sup>th</sup>, 2021.



**Erasmus+ KA2, *GAME-ED: Development of creativity skills by game-based learning methods in adult education*, 2020-1-HU01-KA227-ADU-094052, 2021-2023**

\*\*\*GUIDELINES FOR PLANNING, IMPLEMENTING AND ASSESSING GAME-BASED ACTIVITIES. Retrieved from <https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Guidelines-for-planningimplementing-and-assessing-GameBased-activities.pdf>. October 4<sup>th</sup>, 2021.

\*\*\*A COLLECTION OF GAME BASED ACTIVITIES AND GOOD PRACTICE, RELATED TO TRANSVERSAL SKILLS. Retrieved from [https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice\\_M3.pdf](https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice_M3.pdf), October 7<sup>th</sup>, 2021.

\*\*\*A COLLECTION OF GAME BASED ACTIVITIES AND GOOD PRACTICE, SELECTED BY OUR PROJECT PARTNERS, RELATED TO KEY CURRICULAR SKILLS. Retrieved from [https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice\\_M4.pdf](https://www.levelup4inclusion.eu/wp-content/uploads/2020/11/Collection-of-games-and-good-practice_M4.pdf). October 7<sup>th</sup>, 2021.

\*\*\*Improving “Problem solving in technology-rich environments” skill of low-skilled adults with gamification, serious games and LARP – skillUPgame. Retrieved from <https://ciktrebne.si/projekti/skillupgame/>. September 29<sup>th</sup>, 2021.

\*\*\* <http://konferenca.sc-celje.si/wp-content/uploads/2020/11/ZBORNIK.pdf>

\*\*\* <https://folyoiratok.oh.gov.hu/uj-pedagogiai-szemle/gamifikacio-jatekositas-es-pedagogia>

\*\*\* [http://real.mtak.hu/130850/1/LEGO\\_Digitalis\\_tortenetmeseles.pdf](http://real.mtak.hu/130850/1/LEGO_Digitalis_tortenetmeseles.pdf)

\*\*\* <https://tmt.omikk.bme.hu/tmt/article/view/12374/14089>

\*\*\* <https://tmt.omikk.bme.hu/tmt/article/view/12374/14089>

\*\*\* <https://nagykonyvesbeavatas.hu/hu/node/446>