



GAME BASED LEARNING

Guide For Implementation
of Good Practices
into Education



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- INTRODUCTION -

For centuries teachers have been trying to make students interested in learning with all available means. For centuries also they have been using games and incorporating them into teaching to make it more student-friendly. Chess was used to teach strategic thinking as far back as the Middle Ages, and the game of Kreigsspiel was invented in 1812 specifically to teach Prussian officers strategy. According to The Penguin English Dictionary (2002) a game is an activity engaged in for diversion or amusement. Physical or mental competition conducted according to rules with the participants in direct opposition to each other. Today the approach to use games in the process of teaching became one of the best regarded among teachers.

What is GBL? Definition

What is actually game-based learning? Definitions mostly emphasize that it is a type of game play with defined learning outcome. Other definition calls it the use of games directly in the process of teaching and learning or learning facilitated by or happening with a specially designed educational game. Whichever definition we adopt, a fact is that game-based learning includes elements of competition, engagement, and immediate reward. Players should receive immediate feedback—for example, scoring—when a goal is accomplished. A game-based learning environment allows students to compete with one another or work collaboratively; it provides a level of challenge that motivates students' learning.

Science supported evidences of GBL

The core concept behind game-based learning is teaching through repetition, failure and the accomplishment of goals. The player starts off slow and gains in skill until they're able to skillfully navigate the most difficult levels. Game-based learning takes the same concept and applies it to teaching a curriculum. Students work toward a goal, choosing actions and experiencing the consequences of these actions. When students work on game-based learning they're probably just thinking that they're having fun with a game, learning takes place subconsciously. The game becomes a part of the learning process, and it is aimed at teaching a discrete skill or a specific learning outcome while giving learners an engaging experience. Games can be used to reinforce concepts learned in class, to create greater engagement with course material, and to provide multiple methods of approaching course material.

Acquired abilities and competences


Game-based learning introduces numerous benefits for the participant of the process of learning and the most crucial and predominantly mentioned in studies are:

1 | Fostering motivation for learning

Motivation is the key to good teaching and learning flow in the classroom. For this reason, GBL is very effective, as games are naturally motivating and engaging. Moreover, games often include competition among students; which can raise the level of motivation in a classroom. It is also important to create and incorporate games according to the students' ages, for example, teenagers can tend to lose their motivation if a game seems too childish. In order to avoid this, the game has to be prepared according to its audience with content that matters to students.

2 | Player/student engagement

Games require a player to take part in order to play the game, unlike many learning experiences which allow the learner to take an inactive role. Games that do not achieve cognitive engagement cannot be effective in helping the learner achieve their learning goal. All forms of play have the potential to result in all four types of engagement



(affective, cognitive, behavioral, sociocultural). However, the actual type of engagement will differ by game and within a game, as different games elicit different types of engagement in different contexts and for different learners.

3 | Supporting critical thinking and decision taking

These are two skills that can be practiced and learned especially when engaging in role play. When students are assigned to play specific characters in certain environments, they have to decide, on the spot, what to do in order to reach the goal. Games also force them to find unconventional methods of dealing with a task.

4 | Intensifying group work

It is easy to understand why a game is highly suitable for team and group work. Unity is strengthened and everyone loses or wins when they play a game together. It also improves group work even if students compete against each other.

5. Developing creativity

GBL and games are effective tools for fostering creativity, especially if students are involved in the construction of the game. Imagination has no limits. Teachers can leave opportunities inside of a game where students can fill in the blanks with their own solutions and ideas.

Taking into consideration all of the abovementioned arguments the Erasmus+ Game based learning for development of problem solving skills project aims at providing teachers with an overview of well-selected games that support the learning process. The methodology of selection and all instructions can be found on the following pages.

- METHODOLOGY OF THE PREPARATION GUIDE -

The first step to prepare the Guide For Implementation of Good Practices into Education was to analyse good practices of using any kind of GBL in the secondary school curricula to foster problem solving skills. In order to make it possible a template for bringing the games together from partners was needed.

A template was prepared with all the required data about the games such as name of the game, the required number of players, duration, rules, step by step game play, why it is important for problem solving skills. Then this template was sent to all partners to collect games from different countries.

All partners have defined minimum 6 board games and 2 online games during their research activities. All these games were brought together by using common files in Google document. A big pool was prepared with the contribution of all partners. There were 63 games in total 46 of them were board games and 17 of them were online games.

Following the collection of all games together, an evaluation form was prepared to check all the games in a detailed way. This form was shared with all partners.

<https://bit.ly/3iDSGX8>

Then each partner read the description in the document and graded the games by giving 1 to 10 points according to these criteria:

- 1 | Usefulness for the students**
- 2 | Usefulness for the teachers**
- 3 | Presentation of the game**
- 4 | Difficulty to be used in the classroom**
- 5 | Impact on students' knowledge**
- 6 | Quality of the description**
- 7 | Clarity of the game**

In addition to grading the games, partners stated their thoughts about similarities of the games to each other and they also commented on the effectiveness of the games. By taking into account the overall score given to each game, two lists have been prepared: one for board games and another for online games.

According to grading, the games which received more than 69 points were selected as best practices which will be used in the classrooms. <https://bit.ly/30BSQbu>

During the LTT activity in Shumen, Bulgaria between 14th and 18th September 2020 each game in the guide was tested by the participants and some comments were made for each game and some advice was written for the partners who added the game to the guide.

According to the feedback from the partners, necessary updates on the games have been made and a final guide for the teachers including 24 board - and 7 online games was prepared with the contributions of all partners.

- TYPES OF GAMES WE SELECTED AND WHY -

There are many games that stimulate thinking and development of problem solving skills which are applicable to one degree or another in the learning process. Among these games are the popular board games (cards, chess, dice, etc.), role-playing games, educational computer games, didactic games, etc. In essence each game has an instructive element, requires a winning strategy and certain knowledge, skills and competencies.

For the main purpose of the project concerning using GBL for development of problem solving skills our investigation was on the implementation of the board and online games in education. The both kinds of games have the common base - create goals so that a player is encouraged and motivate to learn and engage with the logic of the game to make respective decisions to achieve these goals:

- The board games are very important to employ cooperative learning in the classroom and to develop important communication and thinking skills, spatial thinking and imagination in a fun way.
- The video games are a natural extension of board games through advanced technology that we possess in our modern age.

They are based on a rule set, just like board games, but the computer takes over the task of rolling those dice, figuring out if you succeeded or not or if you won a battle or lost, etc.

As regards the educational effectiveness of the online educational games could be said that it is great because they also include animations, simulations of different natural phenomena, processes, devices, virtual labs, the presentation of social and historical phenomena in a very modern and attractive ways which lead to development of creativity, critical thinking, systematic thinking of the students and to development of their problem-solving skills.

Some of the games could be very difficult to include in a real lesson in 40 minutes. For the purpose of the project it was important for us to select games on one side with deep didactical idea and on another easy to implement. For this reason, we chose the following criteria:

- applicability,
- accessibility,
- versatility.

The selected indicators directly affect the possibility of a game to be included in the learning process.

As the idea of the project is how to develop problem-solving skills through game-based learning, the selection of games was made and on the basis of six main criteria that are essential for the formation of problem-solving skills - CREATIVITY, COMMUNICATION SKILLS, ANALYTICAL THINKING, DECISION MAKING, RESEARCHING, TEAM WORKING.

- EXAMPLES OF GOOD PRACTICE -

Game-based learning is, in short, learning through games. Using games in the classroom is an exciting proposition for educators that are interested in placing their pupils in the centre of their own learning.

Game-based integration strategies vary depending on the educator's philosophy of teaching, the unique abilities of the learners involved, the needs of the instructional program, and available resources. Some new practitioners of game-based learning may have difficulty conceptualizing how games are used during instruction.

Following are some examples of good GBL practices in education.

Example of Game-Based Learning 1: Gaming In Government

Rebecca Koza is a 4th grade educator in The Arts Based School in North Carolina. Her school is committed to active and creative scholarly exploration that engages students, their family/community and all school personnel in the learning experience. Below, Rebecca shares her experiences integrating a game-based Social Studies unit. To meet the needs of all diverse learners, teaching strategies need to be just as varied.

Describing Gaming through Government as a game-based learning unit:

Throughout the Gaming through Government, students earned points by playing digital games and answering questions.

In order to assess learning in multiple modes, students also demonstrated their understanding by completing a quiz that was aligned to the learning goals of each level. By passing levels, students increased their rank from an intern to a state representative. Perception data and achievement both support that the digital game within a gamified learning experience was very effective and fun. Most importantly, students found the learning experience to be memorable.

<http://gamingthroughgovernment.weebly.com/>

Example of Game-Based Learning 2: Acer Education Academy

- The benefits of Gaming in Education: the Build a World case

Gaming is a fundamental learning method for the youngest generations, so it should play a crucial role in teachers' programs: in the digital era, teachers and professors have many more possibilities than the past to integrate game-based learning in their lessons, in order to facilitate and enhance the educational experience of their students.

<https://acerforeducation.acer.com/success-stories/the-benefits-of-gaming-in-education-the-build-a-world-case/>

Example of Game-Based Learning 3: Assessing With Kahoot

Over the past decade, Jack has taught in low-income schools in Asia and North America. He used the popular tool Kahoot to create formative assessments or review games.

Kahoot is a quiz game where teachers can write multiple choice questions and Kahoot will track the points of everyone in the class and export the data to a spreadsheet for analysis. Jack also helps his students practice leadership and collaborative skills: While playing Kahoot in groups.

Example of Game-Based Learning 4: Writing With Minecraft

Teaching Writing With Minecraft

Using the popular game in station rotation activities during distance learning is a way to bring an element of play and collaboration to writing assignments.

<https://www.edutopia.org/article/guide-teaching-writing-minecraft>

Example of Game-Based Learning 5: Game-Based Learning in Middle School Math

Working with teachers and researchers created free online math games that encourage students to persist in grappling with difficult concepts.

<https://mathsnacks.com/>

<https://www.edutopia.org/article/game-based-learning-middle-school-math>

- HOW TO PLAN A GBL LESSON -

Determine the Purpose of Using a Game

Before researching, determine if you want to use a game for:

1 | Intervention

If a student is struggling to demonstrate understanding of core material, you may consider using a game to address his or her trouble spots.

2 | Enrichment

As students master core material, you may want a game that presents content through different media. For example, it may give questions through text, audio, images and more. This should encourage students to challenge themselves as they explore new ways to process the content.

3 | Reinforcement

Instead of using games to teach and engage individual students, entire classes can play to reinforce curriculum content. This can also make game-based learning a group activity. Some games have multiplayer features and students may naturally compete against each other to earn higher scores.

Play the Game Yourself, Making Sure It Is Aligned with Learning Goals

After finding a game you think is appropriate, play it and make note of:

1 | Teacher Control

2 | Intuitiveness

3 | Engagement

4 | Content Types

5 | Content Levels

Ensure It Meets Expectations from Students

Dedicate Time to Consistent In-Class Play

In a classroom with 1:1 device use, make time for game-based learning activities by:

1 | Including game time as a designated activity in your lesson plan, not an afterthought

2 | Using a game as an entry ticket, drawing students attention to the lesson's topic

3 | Using a game as an exit ticket, allowing students to reflect

In a classroom with limited device use, make time for game-based learning activities by:

1 | Focusing more on non-digital games, such as board games with educational value

2 | Creating learning stations, one of which is playing a device-based game

3 | Playing team games, letting students play in pairs or groups

Assess Progress Throughout Play, Informing, Instruction

Collecting data from the games you implement can uncover student trouble spots and aptitudes, helping you shape in-class instruction.



1 | Self-Reports

For physical games, or video games without reporting features, you can encourage students to take ownership of their progress through self-reporting

2 | Class Discussions

After playing team games, conducting a class-wide discussion allow each group to share difficulties, progress and accomplishments.

- MONITORING -

Questionnaire – Effectiveness of GBL for the Teacher

Dear teacher, we hope you enjoyed using games while teaching your class. Please help us evaluate this teaching method by choosing the number that best describes what you have experienced. Thank you!

1 - Strongly disagree | 2 - Disagree | 3 - Partly Agree | 4 - Agree | 5 - Strongly Agree

A. Board games used in class	1	2	3	4	5
I have integrated the games easily.					
I achieved my teaching objectives while using games in class.					
My students have learnt a lot of new concepts quicker while playing the games.					
It was challenging to integrate the games in my class.					
My students collaborate better since we have been using games in class.					
My students seemed more motivated to learn about the subject I teach when I used the games.					
It was time consuming and I think my students have learnt very little.					
I enjoyed collaborating with my students while playing the games.					
I think my students are better at decision making because we used games in class.					
I will integrate games more often in my class.					

B. Online games used in class	1	2	3	4	5
I have integrated the games easily.					
I achieved my teaching objectives while using games in class.					
My students have learnt a lot of new concepts quicker while playing the games.					
My students collaborate better since we have been using games in class.					
It was time consuming and I think my students have learnt very little.					
My students seemed more motivated to learn about the subject I teach when I used the games.					
It was time consuming and I think my students have learnt very little.					
I enjoyed collaborating with my students while playing the games.					
I think my students are better at decision making because we used games in class.					
I will integrate games more often in my class.					

Questionnaire – Impact of Gbl on Students’ Learning

Dear student, we hope you enjoyed using games while learning in class. Please help us evaluate this teaching method by choosing the number that best describes what you have experienced.

Thank you!

1 - Strongly disagree | 2 - Disagree | 3 - Partly Agree | 4 - Agree | 5 - Strongly Agree

A. Board games used in class	1	2	3	4	5
I have enjoyed using games while learning.					
I have understood the rules of the game easily.					
I have learnt a lot of new concepts quicker while playing the games.					
It was challenging to learn by using games.					
It was fun and engaging to learn this way.					
I had to use my creativity during the games.					
It was time consuming and I have learnt very little.					
I enjoyed collaborating with others while playing.					
I think lessons that involve playing games are more motivating than traditional lessons.					
I have become more interested in learning because the teacher used games.					

B. Online games used in class	1	2	3	4	5
I have enjoyed using games while learning.					
I have understood the rules of the game easily.					
I have learnt a lot of new concepts quicker while playing the games.					
It was challenging to learn by using games.					
It was fun and engaging to learn this way.					
I had to use my creativity during the games.					
It was time consuming and I have learnt very little.					
I enjoyed collaborating with others while playing.					
I think lessons that involve playing games are more motivating than traditional lessons.					
I have become more interested in learning because the teacher used games.					

- RESOURCES - WHERE TO FIND MORE INFORMATION, SELECTION OF THE LINKS AND SHORT DESCRIPTIONS -

There are a lot of new terms and definitions in the learning and teaching area: Play – Way Method of Learning, Team Based Learning, Competence Based Learning, Unstructured Learning or Game Based Learning. It is possible to find many examples of educational games but some of them can be difficult to adapt or the instructions are not clear.

The links and short descriptions below will help you find reliable resources of online and traditional games which provide support for teachers to improve learning outcomes.

- Game – Based and Interactive Learning Activities for Early Years. It offers theoretical introduction for using different games in learning children at the early stages of education and variety of games of different categories.

<https://moey.gov.jm/sites/default/files/Games%20Based%20Manual%20Final%202017.pdf>

- BrainPop is a group of educational websites for students aged 6 to 18. There is an extensive library of educational games covering various subjects.

<https://www.brainpop.com/games/>

- English Time offers interactive games for young children.

<http://www.english-time.eu/for-teachers/interactive-games/>

- Department of Cognitive Psychology, University College, London presents games for teenagers. They are mostly for learning English.

<https://www.onestopenglish.com/support-for-teaching-teenagers/teenagers-games/146737.article>

- Free printable board games you can find on pinterest.

<https://pl.pinterest.com/pin/834362268444598231/>

- A free collection of different online games.

<https://www.learn4good.com/games/puzzle.htm>

- Brain teasers and games for older teenagers.

<https://sharpbrains.com/brainteasers/>

- Games promoting problem solving skills with clear descriptions and tips for teachers.


<https://www.stenhouse.com/sites/default/files/public/legacy/pdfs/8247ch10.pdf>

- Educational apps, games, and websites that encourage problem-solving, inspire to brainstorm, make sense of clues and try different solutions on their path to problem-solving fun.

<https://www.commonsemmedia.org/lists/apps-and-websites-with-lots-of-problem-solving>

- Collection of general problem solving games, puzzles and patterns, Math problems games and reading games for different ages.

<https://online.maryville.edu/online-bachelors-degrees/liberal-studies/problem-solving-games/>

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- Guide how to use games, including commercial ones, with resources and tutorials.
<https://www.edutopia.org/made-with-play-game-based-learning-resources>
 - Basic games which can be played with varying degrees of difficulty, for younger kindergarten-aged kids to older high school students.
<https://www.teachhub.com/classroom-activities/2019/10/engaging-classroom-games-for-all-grades/>
 - Board games which can be played online, puzzles, problems solving and many more. Mostly for younger children.
<https://www.kidsmathgamesonline.com/boardgames.html>
 - Game Based Learning Apps for Schools, mostly paid but there are also some free resources.
<https://www.emile-education.com/#>
 - Games For Change has over 175 games both digital and non – digital, some of them are free. Most of games engage contemporary social issues.
<https://www.gamesforchange.org/games/>
 - Game Arcade presents a lot of online games (free flash games) which could be the first step in introducing games into classrooms.
<http://www.game-arcade.org/>

- TIPS AND TRICKS -

Play is not a luxury, but rather a crucial dynamic of healthy physical, intellectual and socio-emotional development at all age levels. David Elkind, "The Power of Play: Learning What Comes Naturally"

Therefore, dear teacher, PLAY, but remember you should always have a LEARNING OBJECTIVE in mind when choosing a game for your subject or a particular class.

- In order to understand the game, play it yourself with family or friends. Planning a lesson using GBL comes easy if you have tried it before.
- Watch our tutorials about the games or go online if you are still puzzled.
- Choose wisely when planning your game moment: group or individual play?
- Take into consideration the type of lesson you are planning (new concepts, reinforcement of the concepts/practice, skill practice, reviewing) and then choose the appropriate game.
- Students should be mentally prepared for the objectives of the game and the perspective. Presenting general rules will increase implication, motivation and fun.
- The games develop targeted skills, but also skills you did not consider.
- Interaction and exchange of solutions make any game useful and a win overall.
- Errors can be turned into jokes or funny new rules! Or they can be written down to be avoided next time!
- Each game can be adapted or improved. Students can add optional game challenges to increase the difficulty of the base game. These new challenges can be used individually or combined for even more difficult play.
- Plan your teaching goals SMART when using GBL – time flies when we play games.
- Certain games develop certain skills, but all of them can teach taking turns, patience, fairplay.
- Create a safe learning environment and teach empathy while playing educational games. Some people seem slow, but they can prove to be deep thinkers.
- In some games, when players work together, the solutions and discussions can become intense, and even controversial – pay attention to the students who need to practice flexibility in thinking. It can be challenging, but the results are extraordinary.
- Mixed participants avoid avid players to take control of the games. Avid players can be made responsible for explaining the rules.
- If you take risks, take calculated risks. Encourage your students not to rely too often on luck, but rather have a good strategy.
- Winning may be the most important part of a game, but you should also reward the effort and collaboration - not everyone can win a game, but all of your students can score good points in their personal development.

Board Games

- Pay attention to the game package - it should contain all the pieces needed to play.
- Prepare the space for board games. Create a proper co-work space for your students to play in – class management.
- Encourage your students to read the instructions; also guide them through understanding the instructions.
- They can be adapted to almost any subject. Make a template and then involve your students to contribute. Thus they will go through certain concepts and will think of strategies more motivated.

Online games - Troubleshooting

- My game doesn't start! - Make sure that all your electronic devices work properly before starting the game.
- I want to play this game but I don't have my smartphone on me! - Pay attention to what type of device (PC, smartphone, both) is needed in order to play the game.
- The game won't load - Check your internet connection, there's no gaming without the Internet.
- I don't understand how the game is played! - Watch one of our tutorials about the game, or search it online. You can also ask your students to play it and then explain it to the rest of the class.
- I want to add extra players to the group but I can't! - Make an account on the game platform in order to benefit from extra features.
- I can't find a lesson about my subject on the game's platform! - Customize your game content in order to achieve your teaching goals, create your own subject/topic.

REMEMBER!

Play is our brain's favourite way of learning, as Diane Ackerman (contemporary American author) said.

Use the games wisely, targeted and in an engaging manner!

EVERYBODY WILL BECOME A WINNER!



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