



# Methodology of Gamification

**GAME4CHANGE**  
Playful Learning in Next  
Generation  
Entrepreneurship |  
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# Project Partners



6 Universities and HE network  
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## 1. Introduction & Project description

Gamification, understood as the strategic use of game mechanics in non-game contexts, has evolved over the past decade into a key method for innovation and engagement within enterprises and educational institutions. The integration of gamification elements—such as points, leaderboards, and challenges—is now successfully applied by numerous organizations and start-ups to foster motivation, collaboration, and the development of essential skills among employees and learners. Especially in management, playful approaches promote creativity and productivity, helping companies respond flexibly to change.

Gamification also offers a variety of advantages in the education sector: Recent studies report positive effects on learning motivation, engagement, and the development of “21st Century Skills,” including problem-solving, critical thinking, and innovation. This makes gamification an important tool for designing attractive, future-oriented learning experiences.

A clear distinction from related concepts is essential: While Game Based Learning makes use of full-fledged games as educational tools and Playful Learning creates open, playful learning environments, gamification specifically focuses on integrating individual game elements to purposefully enhance learning and work processes.

This concept outlines proven methods of gamification in education and management, presents practical implementation strategies, and demonstrates how teachers and leaders can leverage playful approaches to enable sustainable learning and successful working environments.

### Further aims of the project include:

1. Sensitisation and the development of skills on the part of students from entrepreneurship programs concerning the potential and design options of corporate gamification.
2. Cooperation of students from different European business schools in a joint study programme with the aim of exchange and the generation of European added value in the field of business start-ups.
3. Providing a methodology, toolkits, training and guidelines for usage of gamification in various fields of business education (BE) to teachers and learning designers in a European context.
4. Supporting the development of digital competencies as an integral part of higher education didactics among teachers and students and introducing new tools and methods for student engagements in academic teaching.

The guidelines were developed within the EU project GATEVeT for the field of vocational education and were adapted to the higher education context within Game4Change.

[www.gate-vet.eu](http://www.gate-vet.eu)

## 2. Methodology of Gamification

As Gameboard we are using our Methodology of Gamification – MoG. MoG is developed as an evolution of the PonG framework, specifically designed for the professional development of educators<sup>1</sup>. Its aim is to support teachers in acquiring practical gamification skills and applying them effectively in the classroom. The approach guides participants step by step through a gamification journey, enabling them to independently design and implement gamified learning environments. Throughout this process, participants experience gamification from a player’s perspective, reflecting critically on their own experiences through structured self-assessment. This reflection encourages a learner-centered approach during conception and helps foster meaningful gamified educational scenarios.

MoG is structured to be flexible and adaptable, introducing participants to core paradigms, phases, and methods while providing space for individual customization—such as incorporating specific technologies or learning management systems. As a meta-framework, MoG draws on established theories, models, and practices from gamification and playful learning, integrating them into a coherent and practice-oriented methodology.



Source: Fischer, H., Lehmann, C. & Heinz, M. (2020). Monsters in the Classroom? How to Promote Gamification Readiness of Educators. Conference: Proceedings of the 19th European Conference on e-Learning At: University of Applied Sciences HTW Berlin, 28th to 30th October 2020

The structural foundation of MoG is based on the phases of the Design Thinking approach—a creative, problem-solving methodology that encourages educators to immerse themselves in the creative process while understanding the learner’s point of view. Within MoG, the following seven phases have been adapted for the development of game-based learning scenarios:

<sup>1</sup> Fischer, H., Lehmann, C. & Heinz, M. (2020). Monsters in the Classroom? How to Promote Gamification Readiness of Educators. Conference: Proceedings of the 19th European Conference on e-Learning At: University of Applied Sciences HTW Berlin, 28th to 30th October 2020

1. **Understand:** Effective gamification starts with a deep understanding of the learning situation. This includes analyzing stakeholders, the learning environment, available resources, and technical equipment, as well as needs and expectations.
2. **Empathize:** The next phase focuses on exploring the perspectives, emotions, and needs of everyone involved. Key aspects include learner types and styles, teaching approaches, readiness for gamification, and available resources.
3. **Define:** Insights from the previous steps are synthesized to determine clear requirements for the gamified scenario—learning objectives, curriculum, and the journey learners will experience.
4. **Ideate:** Creativity is central here. Educators develop and explore a range of ideas for game mechanics, strategies, and the overall balance between play and learning, considering tools and available infrastructure.
5. **Test:** Potential solutions are transformed into prototypes—through visualizations, role plays, paper or digital models—and tested with learners to gather constructive feedback.
6. **Implement:** The gamified learning scenario is put into practice. User feedback, evaluation, observation, and reflection help to refine and optimize the approach.
7. **Iterate:** (If required) Continuous improvement is encouraged by revisiting previous phases, ensuring the gamified solution remains effective and engaging.

In summary, MoG provides a structured, user-centered process for educators to create, test, and implement impactful gamification scenarios, drawing from the best practices established by PonG and rooted in the flexible and innovative principles of Design Thinking.

**Start or Level 0 – Introduction**

Explanation: Learn about the background of Gamification.

Topics:

- Theories
- Terms
- Concepts/Frameworks



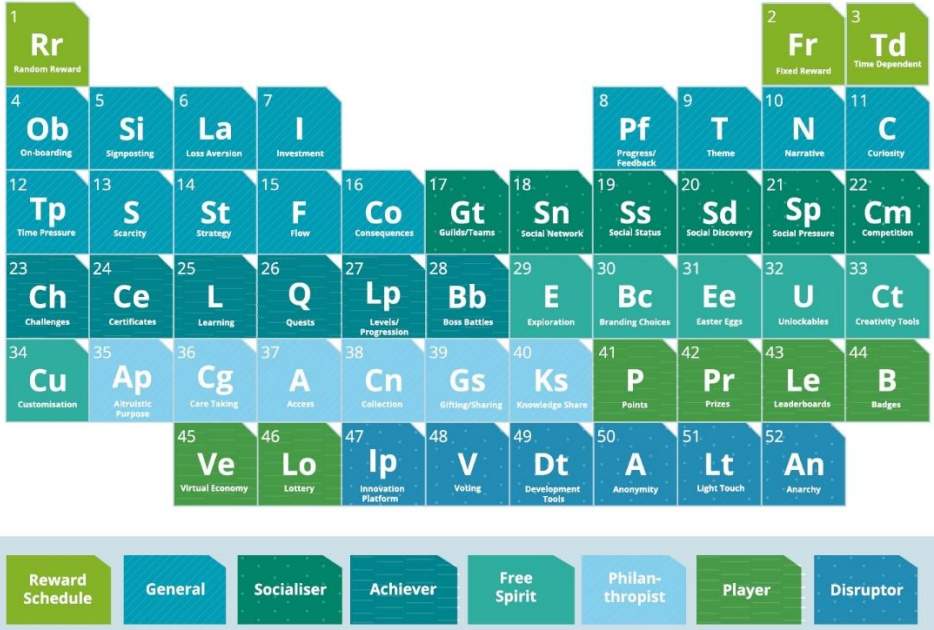
Terms

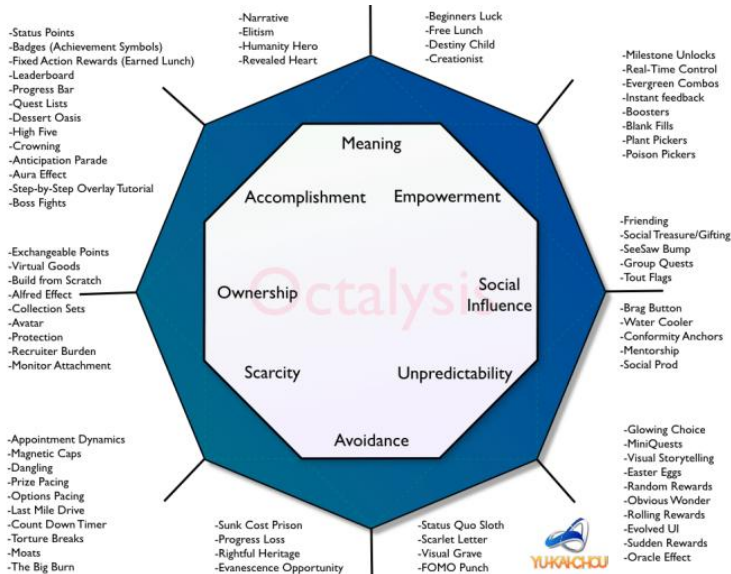
	Terms
<b>Description</b>	<p>Game-based learning is a generic term for the use of games and game-like solutions in non-game contexts. This includes the following different formats:</p> <ul style="list-style-type: none"> <li>• <b>Serious Games</b> <ul style="list-style-type: none"> <li>○ Entire games used in a learning context.</li> <li>○ e.g.: Microsoft Fight Simulator</li> </ul> </li> <li>• <b>Gamification</b> <ul style="list-style-type: none"> <li>○ Use of game elements in non-game contexts.</li> <li>○ e.g. Duolingo</li> </ul> </li> <li>• <b>Playful Design</b> <ul style="list-style-type: none"> <li>○ Only uses ideas and design from games, e.g. user interfaces that are reminiscent of a game.</li> <li>○ e.g. LinkedIn</li> </ul> </li> <li>• <b>Simulation Games</b> <ul style="list-style-type: none"> <li>○ Realistic virtual environments and virtual mapping of processes in which behaviour can be tested/practiced. Direct game elements are not always integrated, but game mechanics are used to pursue a learning goal.</li> <li>○ e.g. SPUN</li> </ul> </li> <li>• <b>Games</b> <ul style="list-style-type: none"> <li>○ Games to have fun without an intended learning purpose. In contrast to play, games follow defined rules and tasks/goals that are set in advance for the different roles.</li> <li>○ e.g. Tetris</li> </ul> </li> </ul>
<b>Examples</b>	<p>Microsoft Fight Simulator  <a href="https://www.youtube.com/channel/UCqONzeACDBaF6FfKjh7ndAQ">https://www.youtube.com/channel/UCqONzeACDBaF6FfKjh7ndAQ</a>            Duolingo  <a href="https://www.youtube.com/watch?v=3_FJCaS-hro">https://www.youtube.com/watch?v=3_FJCaS-hro</a></p>
<b>Sources</b>	<p>Gamelearn. Eight examples that explain all you need to know about serious games and game-based learning.  <a href="https://www.game-learn.com/all-you-need-to-know-serious-games-game-based-learning-examples/">https://www.game-learn.com/all-you-need-to-know-serious-games-game-based-learning-examples/</a></p> <p>Marczewski, A. (2017). The Game Thinking Spectrum.  <a href="https://www.gamified.uk/2017/07/31/game-thinking-spectrum">https://www.gamified.uk/2017/07/31/game-thinking-spectrum</a></p>

	<b>(Digital) Game-based Learning/ (D)GBL</b>
<b>Description</b>	Game-based learning describes the use of playful elements up to digital games in the educational context for imparting and acquiring knowledge through active, self-directed, constructive and situated learning within the framework of digital teaching/learning processes. The "D" for "digital" is added to indicate that the focus is on computer and video games as digital games.
<b>Importance</b>	The integration of GBL in teaching and learning scenarios aims at improving the participants' motivation to learn and enhances the learning process.
<b>Use</b>	Game-based learning is characterised by the following features: <ul style="list-style-type: none"> <li>• different game mechanisms are combined with each other</li> <li>• the application of the game is digital or analogue</li> <li>• the learning process feels like playing</li> <li>• learning becomes a positive experience</li> </ul>
<b>Sources</b>	Video: <a href="https://www.youtube.com/watch?v=zPFJQqsATOk">https://www.youtube.com/watch?v=zPFJQqsATOk</a> [25.08.2023].

	<b>Gamification</b>
<b>Related terms</b>	Game Thinking   Game Based Learning   Playful Design   Simulation   Game
<b>Description</b>	In general, we speak of gamification when game elements are used in non-game contexts to intensify the motivation of the users and/or to influence their behaviour. This begins, for example, with points that you can collect when shopping or bonus miles that you can collect when flying. This also includes embedding tasks in a story, right up to the alarm clock that you have to beat in the morning so that you actually wake up.
<b>Importance</b>	Gamification is an (additional) way to motivate people to do something, e.g. to do or use something or to do or use something more intensively. The flow experience - a positive rush of drive - is also mentioned again and again in this context.
<b>Examples</b>	Duolingo <a href="https://de.duolingo.com/">https://de.duolingo.com/</a> [25.08.2023] Trello <a href="https://trello.com/de">https://trello.com/de</a> [25.08.2023] gOPAL <a href="https://tud.de/deinstudienerfolg/sas">https://tud.de/deinstudienerfolg/sas</a> [25.08.2023]
<b>Sources</b>	Stieglitz, S. (2015). Gamification –Vorgehen und Anwendung. HMD Praxis der Wirtschaftsinformatik, 1-10. <a href="https://www.researchgate.net/publication/282434911_Gamification_-_Vorgehen_und_Anwendung">https://www.researchgate.net/publication/282434911_Gamification_-_Vorgehen_und_Anwendung</a> [25.08.2023]

**Concepts/Frameworks**

	<b>Periodic Table of Gamification Elements</b>
<b>Description</b>	There are a variety of game elements that can be used in different contexts. Marczewski's periodic table gives a comprehensive overview of these elements.
<b>Importance</b>	Different game elements motivate differently and address different people. The selection of game elements thus supports the target group-oriented design of gamified applications.
<b>Use</b>	<p>The periodic table of gamification elements (Marczewski 2017) includes 51 game elements. These are assigned to the following categories:</p> <ul style="list-style-type: none"> <li>• Reward Schedule</li> <li>• General</li> <li>• Player Types</li> </ul>  <p>The periodic table consists of 51 elements arranged in a grid. The elements are categorized into three main groups: Reward Schedule (green), General (blue), and Player Types (dark blue). The elements are numbered 1 to 51. Below the table, there are three categories: Reward Schedule, General, and Player Types.</p>
<b>Examples</b>	<ul style="list-style-type: none"> <li>• Narration, embedding something in a story</li> <li>• Time pressure, giving a task a countdown</li> <li>• Rewards, badges, prizes</li> <li>• Competition</li> <li>• Exploration, discovering an environment and details</li> <li>• Challenges, missions, quizzes</li> <li>• Collect points, view leaderboards</li> <li>• Advance to new levels</li> </ul>
<b>Sources</b>	<p>Marczewski, A. (2017). The Periodic Table of Gamification Elements.  <a href="https://www.gamified.uk/2017/04/03/periodic-table-gamification-elements/">https://www.gamified.uk/2017/04/03/periodic-table-gamification-elements/</a>          [25.08.2023]</p>

	<p><b>Octalysis Framework</b></p>
<p><b>Description</b></p>	<p>Octalysis, is a human behaviour-focused gamification framework based on eight core drivers of human motivation:</p> <ol style="list-style-type: none"> <li>1) Epic Meaning &amp; Calling</li> <li>2) Development &amp; Accomplishment</li> <li>3) Empowerment of Creativity &amp; Feedback</li> <li>4) <u>Ownership &amp; Possession</u></li> <li>5) Social Influence &amp; Relatedness</li> <li>6) Scarcity &amp; Impatience</li> <li>7) Unpredictability &amp; Curiosity</li> <li>8) Loss &amp; Avoidance</li> </ol>
<p><b>Importance</b></p>	<p>Games are fun because they appeal to certain core drives in humans that motivate us to engage in certain activities and increase engagement. Here, different types of game techniques can drive the user differently: some in an inspirational way, others in a manipulative and compulsive way. Everything that humans do is based on one or more of the 8 core drives.</p>
<p><b>Use</b></p>	<p>The Octalysis framework consists of 3 stages. The first stage is primarily concerned with the use and development of the 8 motivators.</p> <div style="text-align: center;">  <p>The diagram shows the Octalysis Framework as an octagon with eight segments, each representing a core driver of human motivation. The segments are: Meaning, Accomplishment, Empowerment, Social Influence, Unpredictability, Avoidance, Scarcity, and Ownership. Each segment is connected to a list of game techniques that can be used to engage users. The techniques are listed around the octagon, with some overlapping between segments. The YUKAICHO logo is visible in the bottom right corner of the diagram.</p> </div> <p>This knowledge from Stage 1 can then be applied to Stage 2, where the aim is to optimise the experience in all four stages of a game's journey:</p> <ol style="list-style-type: none"> <li>1. discovery (why would people want to embark on the journey in the first place).</li> <li>2. onboarding (how to teach users the rules and tools to play the game)</li> <li>3. scaffolding (the regular path of repeated actions towards a goal)</li> <li>4. endgame (how do you keep your veterans).</li> </ol> <p>This is specifically about getting a sense of what the players feel during the journey. Once level 2 has been mastered, the next step is to consider the different types of players to see how different types of people are motivated at different stages of the experience.</p>
<p><b>Sources</b></p>	<p>Chou, Yu-kai  <a href="https://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/">https://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/</a> [25.08.2023]</p>

	<b>Learning Mechanics-Game Mechanics</b>
<b>Description</b>	The "Learning Mechanics - Game Mechanics" model is used to analyse serious games in terms of their game elements and learning mechanics. The developed illustration of the LM-GM can represent the interaction of both, so that conclusions can be drawn about the effectiveness of the game from the point of view of game designers and also educators, as well as about the teaching-learning setting in which it is to be integrated.
<b>Importance</b>	The example of serious games shows that games can create a connection between learning and entertainment and thus enable an intrinsically motivated generation of knowledge. For teachers, the LM-GM framework therefore serves primarily as a support to evaluate the effectiveness of a serious game and to translate pedagogical elements into game mechanics.
<b>Use</b>	<p>Educators can use the model to draw a "LM-GM map" (illustration, graphic representation) for a game. This illustrates the most important pedagogical elements of their teaching-learning arrangement and the opposing game mechanics (motivational, entertaining factors) as well as their interaction. A user of the model can thus see which LM and GM are used in each game situation, how they relate to each other and how they can be implemented.</p>
<b>Source</b>	Arnab, S., Lim, T., Carvalho, M.B., Bellotti, F., de Freitas, S., Louchart, S., Suttie, N., Berta, R. & De Gloria, A. (2015), "Mapping learning and game mechanics for serious games analysis", British Journal of Educational Technology, vol. 46, no. 2, pp. 391-411, <a href="https://bera-journals.onlinelibrary.wiley.com/doi/10.1111/bjet.12113">https://bera-journals.onlinelibrary.wiley.com/doi/10.1111/bjet.12113</a> [25.08.2023]

Level 1 – Understand

Explanation: An effective method can only be found if the learning situation has really been understood.

Topics:

- Resources
- Stakeholder
- Curricula



Resources

	Resources/ general conditions
<b>Description</b>	Game elements can be integrated into almost any teaching-learning setting. However, certain resources and framework conditions must be met.
<b>Importance</b>	Gamification does not automatically lead to success. Several steps need to be taken into account when implementing gamification. This means that before the development of gamification can begin, the general conditions and resources must first be determined and fulfilled so that the desired goal can also be successfully achieved.
<b>Use</b>	<p>At the beginning, the general conditions and resources must be clarified. These include:</p> <ol style="list-style-type: none"> <li>1) Determine the general conditions <ul style="list-style-type: none"> <li>• Identify the problem</li> <li>• Define goals and expectations</li> <li>• Determine main topic</li> <li>• Time resources (time to prepare teaching materials, duration of implementation, etc.)</li> <li>• Existing skills of the teacher for creation</li> <li>• Number of "players"</li> <li>• Analysis of the target group (link to personas, player types)</li> <li>• Curricular embedding/preferences (link to Curriculum)</li> </ul> </li> <li>2) Develop concept <ul style="list-style-type: none"> <li>• Define game idea (theme, story, ...)</li> <li>• Online, presence or mobile?</li> <li>• Synchronous or asynchronous</li> <li>• Define central game elements</li> <li>• How do teaching and game fit together?</li> <li>• What technology (tools, media) should be used?</li> <li>• Technical resources (internet access, beamer, PC, smartphone etc.)</li> <li>• - Define required material</li> </ul> </li> </ol>
<b>Source</b>	<p>Epic Gamification Hangout with Prof. Kevin Werbach - "Gamification: A New Adventure"</p> <p><a href="https://www.epicwinblog.net/2013/05/epic-gamification-hangout-with-prof.html">https://www.epicwinblog.net/2013/05/epic-gamification-hangout-with-prof.html</a> [25.08.2023]</p>

Curriculum

	Curriculum
<b>Description</b>	<p>Game elements can be integrated into the curriculum in various ways or can themselves serve as the didactic framework of a curriculum. The starting point for planning game sequences is therefore the analysis of the existing curriculum, e.g. on the basis of the questions:</p> <ul style="list-style-type: none"> <li>• Which pedagogical needs are being pursued?</li> <li>• What learning goals are to be achieved?</li> <li>• How is the teaching-learning scenario to be gamified embedded in the curriculum?</li> <li>• What are the needs of the target group?</li> </ul>
<b>Importance</b>	<p>The game elements and mechanics used have a direct influence on the competences to be taught or learned (Yunyongying, 2014). If the decision is made to gamify sections of the curriculum (seminars, lectures, only parts of a course), the "big picture" must always be kept in mind. Only in this way can conflicts with other curriculum elements be ruled out and a connection established within all course components, otherwise this could lead to a negative learning experience.</p>
<b>Anwendung</b>	<p>Teachers have acquired a knowledge of the basic concepts related to gamification. Furthermore, the composition of the target group is known and the curriculum element to be gamified is precisely defined.</p>
<b>Example</b>	<p>Planning gamified learning units, how can teachers proceed:  <a href="https://www.edutopia.org/blog/project-based-learning-gamification-go-great-together-heather-wolpert-gawron">https://www.edutopia.org/blog/project-based-learning-gamification-go-great-together-heather-wolpert-gawron</a>      [25.08.2023]</p>
<b>Source</b>	<p>Yunyongying P. (2014). Gamification: Implications for Curricular Design. <i>Journal of graduate medical education</i>, 6(3), 410–412.  <a href="https://doi.org/10.4300/JGME-D-13-00406.1">https://doi.org/10.4300/JGME-D-13-00406.1</a> [25.08.2023]</p>

Level 2 – Empathize

Explanation: The aim is to find out the needs, fears, perspectives and emotions involved in the learning situation

Topics:

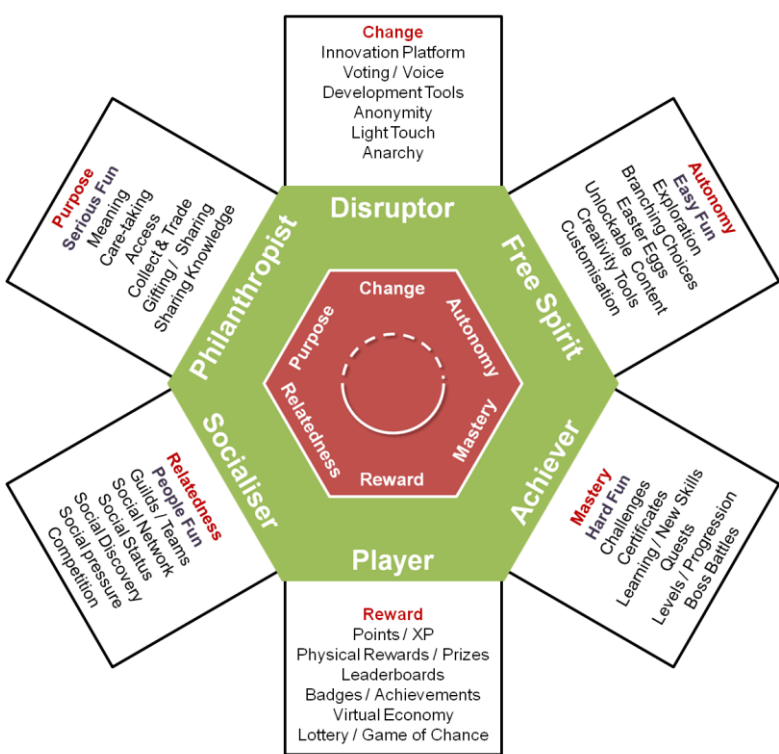
- Persona
- Player Types
- Learning styles



**Persona**

<b>Bild</b>	Persona
<b>Description</b>	<p>Persona - is a fictional person with realistic characteristics of the learner.</p> <p>Personas are individual and vividly described representatives of the target group. They are developed based on analyses, tests, observations or existing information. They are used for targeted decisions about functionalities and design.</p>
<b>Importance</b>	<p>Games and game elements have different effects on people. This knowledge helps to understand different motivational characteristics.</p> <p>It helps to answer the questions: "For whom is the teaching-learning arrangement being developed?", "Who is the target group?", "What motivation does the target group have to use the teaching-learning arrangement?", "What requirements does the target group have of the teaching-learning arrangement?" and finally "What design solutions could meet these requirements?".</p>
<b>Use</b>	<p>Use the data you have and start brainstorming. Create fictional learners for whom you want to gamify a teaching-learning arrangement. The following data can help in developing a persona:</p> <ol style="list-style-type: none"> <li>1) Gathering the key points &amp; organising data           <ul style="list-style-type: none"> <li>• Characteristics according to socio-demographic criteria (age, gender, etc.)</li> <li>• Goals and tasks according to situational criteria (user tasks, benefits, needs)</li> <li>• Motivation and attitudes according to psychographic criteria (motives, interests, attitudes and values)</li> <li>• Requirements and needs according to behavioural criteria (media use)</li> <li>• o Using matrices and clusters, user profile groups can be formed. For example, users could be divided into novice, normal or expert. Erstellen einer Persona</li> </ul> </li> <li>2) Preparation of a profile/ short biography</li> </ol>
<b>Source</b>	<p><b>Journal:</b> Ewald Judt; Claudia Klausegger (2019). Personas. bank und markt, Heft 8, S. 373. Fritz Knapp Verlag GmbH.</p> <p>URL: <a href="https://research.wu.ac.at/en/publications/bankmanagement-glossar-personas-7">https://research.wu.ac.at/en/publications/bankmanagement-glossar-personas-7</a>[25.08.2023].</p>

**Player Types**

	Player Types
<b>Description</b>	There are different types of players, which also play a role in the development of game-based applications. Different models try to classify these player types, e.g. Player Types (Bartle 1996) or User Types (Marczewski 2015).
<b>Importance</b>	Games and game elements have different effects on people. This knowledge helps to understand different types of motivation. The analysis of player types supports the target group-oriented design of gamified applications.
<b>Use</b>	<p>Using the example of the 6 User Types (Marczewski 2015): This model differentiates between six types of users, whose motivation is outlined below:</p> <ul style="list-style-type: none"> <li>• Socialiser, are motivated by social relationships and interacting interactions (e.g. social status).</li> <li>• Free Spirit, are motivated by freedom, self-development, creation and exploration (e.g. Easter Eggs).</li> <li>• Achiever, are motivated by challenges, learning new things and striving for improvement (e.g. quests).</li> <li>• Philanthropist, are motivated by the importance of their actions, wanting to give and unselfishly enrich the lives of others (e.g. sharing knowledge).</li> <li>• Player, are extrinsically motivated by collecting rewards for themselves (e.g. badges).</li> <li>• Disruptors, are motivated by positive or negative change created directly or by other users (e.g. development tools).</li> </ul> 

<b>Example</b>	Test which type of player you are: <a href="https://www.gamified.uk/UserTypeTest2016/user-type-test.php?q=l&amp;lang=de">https://www.gamified.uk/UserTypeTest2016/user-type-test.php?q=l&amp;lang=de</a> [25.08.2023]
<b>Source</b>	Marczewski, A. (2015). Even Ninja Monkeys Like to Play. Gamification, Game Thinking & Motivational Design. CreateSpace Independent Publishing Platform. <a href="https://www.gamified.uk/user-types/">https://www.gamified.uk/user-types/</a> [25.08.2023]

## Learning Styles

<b>Bild</b>	<b>Learning Styles</b>																							
<b>Description</b>	Learning styles are the individual ways in which learners acquire knowledge, skills and abilities. In the context of game-based learning, these different styles should be considered as they have an impact on individual experiences in game settings.																							
<b>Importance</b>	The different learning styles of the learners must be taken into account when designing the game-based teaching-learning arrangement, as not all learners acquire knowledge in the same way and there are a variety of learning paths. The different learning styles result in different types of learners or players.																							
<b>Use</b>	<p>The use of game elements and game mechanics is adapted to the different learning styles. Different methods and materials help to address the different styles in order to achieve a high learning success.</p> <p>Example: LEGA</p> <p>LEGA is a learner-centred gamification framework that aligns the educational world with the gaming world. It integrates the intended learning outcomes, as well as the different learning styles of the learners, the learning activities and mechanisms, and suggests appropriate game mechanics, through which the teaching-learning setting can be gamified. At the same time, the game mechanics can in turn be assigned to different player types, e.g. by Andrej Marczewski.</p> <table border="1"> <thead> <tr> <th>Teaching/Learning Activities (TLAs)</th> <th>Learning Mechanics (LMs)</th> <th>Player Types (PTs)</th> <th>Gamification Mechanics and Elements (GMs)</th> </tr> </thead> <tbody> <tr> <td rowspan="6">- Brainstorming - Group discussion.</td> <td>BT1-REM: Discover, explore.</td> <td>All types below</td> <td>On-boarding/tutorials, signposting, theme, narrative/story, curiosity/mystery box, time pressure, fixed reward schedule.</td> </tr> <tr> <td>BT2-UND: Participation, questions and answers.</td> <td>SOC</td> <td>Guilds/teams, social network, social status, social discovery, social pressure.</td> </tr> <tr> <td>BT3-APP: Action/Task, cooperation, demonstration.</td> <td>FR</td> <td>Exploration, branching choices, easter eggs, unlockable/rare content, creativity tools, customisation.</td> </tr> <tr> <td>BT4-ANA: Analyse, feedback, identify, observation, shadowing.</td> <td>PH</td> <td>Meaning/purpose, care-taking, access, collect &amp; trade, gifting/sharing, sharing knowledge</td> </tr> <tr> <td>BT5-EVA: Collaboration, hypothesis, incentive, motivation, reflect/discuss.</td> <td>PLA</td> <td>Points/experience points (XP), physical rewards/prizes, leaderboards/ladders, badges/achievements, virtual economy, lottery/game of chance.</td> </tr> <tr> <td>BT6-CRE: Accountability, ownership, planning, responsibility.</td> <td>DIS</td> <td>Innovation platform, voting/voice, development tools, anonymity, light touch, anarchy.</td> </tr> </tbody> </table>	Teaching/Learning Activities (TLAs)	Learning Mechanics (LMs)	Player Types (PTs)	Gamification Mechanics and Elements (GMs)	- Brainstorming - Group discussion.	BT1-REM: Discover, explore.	All types below	On-boarding/tutorials, signposting, theme, narrative/story, curiosity/mystery box, time pressure, fixed reward schedule.	BT2-UND: Participation, questions and answers.	SOC	Guilds/teams, social network, social status, social discovery, social pressure.	BT3-APP: Action/Task, cooperation, demonstration.	FR	Exploration, branching choices, easter eggs, unlockable/rare content, creativity tools, customisation.	BT4-ANA: Analyse, feedback, identify, observation, shadowing.	PH	Meaning/purpose, care-taking, access, collect & trade, gifting/sharing, sharing knowledge	BT5-EVA: Collaboration, hypothesis, incentive, motivation, reflect/discuss.	PLA	Points/experience points (XP), physical rewards/prizes, leaderboards/ladders, badges/achievements, virtual economy, lottery/game of chance.	BT6-CRE: Accountability, ownership, planning, responsibility.	DIS	Innovation platform, voting/voice, development tools, anonymity, light touch, anarchy.
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<b>Source</b>	<a href="https://www.researchgate.net/publication/311317334_LEGA_A_Learner-centered_GAMification_Design_Framework">https://www.researchgate.net/publication/311317334_LEGA_A_Learner-centered_GAMification_Design_Framework</a> [25.08.2023]																							

Level 3 – Define

Explanation: The most important insights from the first two phases “understand” and “empathize” are merged to derive requirements.

Topics:

- Learning Goals
- Tools



## Learning Goals

	<b>Learning Goals</b>
<b>Description</b>	Clearly defined objectives facilitate decision-making in GBL design. Each educational intervention or game element must contribute to achieving the defined objectives.
<b>Importance</b>	Objectives define the target state and enable the control of success (evaluation). Objectives of the development of GBL scenarios are learning and game objectives. Learning objectives describe the desired increase in competence of a learner, related to a specific learning object. Play, however, is mainly about emotional, social and motivational aspects (e.g. enjoyment, escape from everyday life, togetherness, etc.). Striking the balance between learning and play objectives is the challenge of GBL design.
<b>Use</b>	<p><b>Learning objective</b></p> <p>A carefully formulated learning objective comprises three parts, namely the end behaviour, the conditions and the scale. Learning objectives can be assigned to different taxonomy levels. Taxonomies serve to order learning objectives. They help to organise the diversity of learning objectives hierarchically according to logical criteria and are very useful for checking learning objectives.</p> <p><b>Game objective</b></p> <p>Every game is defined by a (game) goal, which represents the desirable state for the player (e.g. achieving a score, taking on a role). These goals are crucial for learning purposes in that they must go hand in hand with the defined learning objectives. The acquisition of a defined skill (learning goal) must lead to the achievement of a goal averted by game mechanics (reaching a higher level). The goal of any game is to motivate the player to perform certain actions and to "keep him in the game". The transfer of game logics to learning processes should therefore stimulate a deeper intrinsically motivated engagement of the learner with the learning object.</p>
<b>Example</b>	<a href="https://www.youtube.com/watch?v=OOy3m02uEaE">https://www.youtube.com/watch?v=OOy3m02uEaE</a> [25.08.2023]
<b>Source</b>	Taxonomy of Educational Objectives, Allyn and Bacon, Boston 1956, Pearson Education 1984

## Tools

	<b>Tools</b>
<b>Description</b>	Tools such as Kahoot, LearningApps or H5P support the learning and teaching processes and can be integrated into teaching-learning scenarios as small interactive, multimedia building blocks. The free tools can be used to test knowledge in a creative way.
<b>Importance</b>	<ul style="list-style-type: none"> <li>• Use to increase the motivation of the participants, through the short change of methods.</li> <li>• To determine individual and overall knowledge levels</li> <li>• Challenge and ambition through playful competition among participants</li> <li>• Uncomplicated use due to ease of use by teachers as well as learners</li> </ul>
<b>Use</b>	Use as an additional teaching tool to activate knowledge, to test knowledge, to secure acquired knowledge and skills or for discussions and coordination within the teaching-learning scenario, e.g. through: <ul style="list-style-type: none"> <li>• quizzes</li> <li>• single-choice or multiple-choice</li> <li>• surveys</li> <li>• puzzles</li> <li>• open questions etc.</li> </ul>
<b>Examples</b>	<p><b>Kahoot</b></p> <ul style="list-style-type: none"> <li>• for creating interactive quizzes</li> <li>• Video: <a href="https://www.youtube.com/watch?v=7XzfWHdDS9Q">https://www.youtube.com/watch?v=7XzfWHdDS9Q</a></li> <li>• Link: <a href="https://kahoot.com/">https://kahoot.com/</a></li> </ul> <p><b>Quizlet</b></p> <ul style="list-style-type: none"> <li>• Knowledge check through various generated flashcards, games and tests</li> <li>• Video: <a href="https://www.youtube.com/watch?v=7oJk0IBynoU">https://www.youtube.com/watch?v=7oJk0IBynoU</a></li> <li>• Link: <a href="https://quizlet.com/">https://quizlet.com/</a></li> </ul> <p><b>Learning Apps</b></p> <ul style="list-style-type: none"> <li>• Creation of multimedia interactive learning elements</li> <li>• Video: <a href="https://www.youtube.com/watch?v=hNgFXHv6els">https://www.youtube.com/watch?v=hNgFXHv6els</a></li> <li>• Link: <a href="https://learningapps.org/">https://learningapps.org/</a></li> </ul> <p><b>H5P</b></p> <ul style="list-style-type: none"> <li>• Offers 43 different interactive applications (also: interactive videos, presentations ...)</li> <li>• Tutorial: <a href="https://h5p.org/documentation/for-authors/tutorials">https://h5p.org/documentation/for-authors/tutorials</a></li> <li>• Link: <a href="https://h5p.org/">https://h5p.org/</a></li> </ul> <p>More tools:</p> <ul style="list-style-type: none"> <li>• Quizizz</li> <li>• Mentimeter</li> <li>• Padlet</li> <li>• Classroomscreen</li> </ul>

Level 4 – Ideate

Explanation: The systematic development of ideas is one of the most important phases in the development of gamified learning arrangements.

Topics:

- Narration
- Game Mechanics
- Rewards



## Narration

	Storytelling
<b>Description</b>	Storytelling is used to convey information, knowledge, values and opinions. Through storytelling, learners become emotionally involved. Therefore, the main characteristics of a story can be described as "engagement" and "emotional immersion". This means that the player is immersed in another world and thus remains engaged from beginning to end.
<b>Importance</b>	Storytelling helps to increase motivation to learn and can support problem-solving learning. The increase in motivation to learn can be achieved on the one hand by the player identifying with characters who have a positive attitude towards learning. On the other hand, the narrative can strengthen confidence in one's own ability to learn, for example by NPCs (non-player characters) using affirmative language.
<b>Use</b>	There are several aspects to consider when designing the story: <ul style="list-style-type: none"> <li>• <b>Purpose of the story:</b> What is the learning objective of the story? What message should the story convey?</li> <li>• <b>Narration:</b> What narrative form is used?</li> <li>• <b>Dramatic question:</b> The question of whether the protagonist will reach his or her goal; usually answered at the end of the story to maintain the suspense.</li> <li>• <b>Characters in the story:</b> The characters can be either simple or complex, which in turn influences the plot.</li> <li>• <b>Language used:</b> The language should be adapted to the target group of the story.</li> <li>• <b>Emotional Content:</b> The emotions experienced by the characters are conveyed to the learners.</li> <li>• <b>Story content:</b> the story can be delivered through text, speech, music, video or animation; a combination is also possible.</li> </ul>
<b>Example</b>	<a href="#">Games for Change</a> [25.08.2023]
<b>Source</b>	Smeda, N., Dakich, E., & Sharda, N. (2010). Developing a framework for advancing e-learning through digital storytelling. <a href="http://www.iadisportal.org/digital-library/developing-a-framework-for-advancing-e-learning-through-digital-storytelling">http://www.iadisportal.org/digital-library/developing-a-framework-for-advancing-e-learning-through-digital-storytelling</a> [25.08.2023]

## Game Mechanics

	Game Mechanics
<b>Description</b>	<p>Game mechanics are "playful" components such as puzzles, quizzes or memory that serve to trigger interaction. In doing so, they function primarily to enrich learning activities.</p> <p>An interaction in this case means the relation to other players/learners, i.e. it always takes place when several learners compete with or against each other. This can take place in different game modes, e.g. in a competition (everyone plays against everyone, several groups compete against each other, etc.) or in the sense of a cooperative game (everyone pursues a common goal and the players support each other).</p>
<b>Importance</b>	<p>Interactive methods are becoming increasingly important for knowledge transfer. Through interactive learning modules, one tries to create incentives and participation structures that "activate" learners, or rather, make them receptive to knowledge.</p>
<b>Use</b>	<p>Game mechanics can be used both analogue and digital. There is a wide range of interactive content that can be used in teaching-learning scenarios:</p> <ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Drag and drop</li> <li>• Single/Multiple choice tests</li> <li>• Find the mistake</li> <li>• puzzles</li> <li>• Image pairing</li> <li>• Brainstorming</li> <li>• Fill the blanks</li> <li>• Word Grid</li> <li>• Guess</li> <li>• Hangman</li> <li>• Interactive group work (e.g. World Café)</li> <li>• Votings</li> <li>• Simulation games</li> <li>• Scavenger Hunt</li> </ul>
<b>Example</b>	Tools, e.g. H5P and LearningApps
<b>Source</b>	<p>Schell, J. (2015): The Art of Game Design. A book of Lenses (2. Ed.).  <a href="https://drive.google.com/file/d/1J2PH_Eir1V7Ht82LmKlavXbEIFIVqk6P/view">https://drive.google.com/file/d/1J2PH_Eir1V7Ht82LmKlavXbEIFIVqk6P/view</a>          [25.08.2023]</p>

**Rewards**

	Rewards
<p><b>Description</b></p>	<p>Rewards can be both intrinsic and extrinsically motivating for learners. An intrinsically motivated sense of achievement occurs when a milestone to be reached in the learning arrangement is achieved. If these achievements are linked to external factors (e.g. badges, points, rankings, physical prizes), extrinsic motivational factors are applied. Rewards are to be understood as a recognition of achievement, not the achievement itself.</p>
<p><b>Importance</b></p>	<p>Rewards can be used to recognise achievements/milestones (e.g. competences gained or knowledge acquired). They can also be used as reinforcing rewards at important points within the individual learning path (the Learners Journey). Rewards need to be well defined, i.e. learners know what actions have earned them a reward and exactly what success is being expressed. The following illustration of the Employee's Journey can be applied to the Learners Journey in an equivalent way.</p> <div data-bbox="528 981 1390 1637" data-label="Figure"> <p>The graph, titled 'Employee's Journey Reward Schedule', plots 'Challenge Level' on the vertical axis (from Low to High) against 'Skill Level / Time' on the horizontal axis (from Low to High). A blue line representing 'Progress' starts at a low challenge level and rises through several stages: 'On-Boarding', 'Habit-Building', and 'Mastery'. Red dots on the line represent 'Reward' points. The area above the line is shaded red and labeled 'Frustration (Anxiety)'. The area below the line is shaded blue and labeled 'Boredom'. A legend on the right identifies the blue line as 'Progress' and the red dot as 'Reward'. A small logo and copyright notice '© Andrzej Marczewski 2012' are in the bottom right corner of the graph area.</p> </div>
<p><b>Use</b></p>	<ul style="list-style-type: none"> <li>• Fixed Reward Schedule: It is important that (learning) achievements are recognised. A reward schedule defines in advance which milestones/achievements result in which reward (e.g. badges).</li> <li>• Random Rewards: Surprise wins/successes that are not predictable in time.</li> <li>• Time Dependent Rewards: Promoting motivation by announcing a reward that is only available for a defined time.</li> </ul>

	<ul style="list-style-type: none"> <li>• Easter Eggs: Unannounced rewards serve as recognition for learners who keep a watchful eye (e.g. mystery boxes).</li> <li>• Physical Rewards/ Prizes: Physical prizes can provide additional external motivation for learners (e.g. book voucher).</li> <li>• Lottery: this type of gambling can be rewarded with physical prizes - but does not have to be.</li> </ul>
<b>Example</b>	Swisscom/Samsung: <a href="https://www.youtube.com/watch?v=CsGlzu2NzX0">https://www.youtube.com/watch?v=CsGlzu2NzX0</a> Starbucks Rewards: <a href="https://www.starbucks.com/rewards/">https://www.starbucks.com/rewards/</a> McDonalds Monopoly: <a href="https://www.youtube.com/watch?v=bgmj6oafTeI">https://www.youtube.com/watch?v=bgmj6oafTeI</a> [25.08.2023]
<b>Source</b>	A.Marczewski: <a href="https://www.gamified.uk/2019/04/10/rewards-and-reward-schedules/">https://www.gamified.uk/2019/04/10/rewards-and-reward-schedules/</a> Yu-kai Chou: <a href="https://yukaichou.com/marketing-gamification/six-context-types-rewards-gamification/">https://yukaichou.com/marketing-gamification/six-context-types-rewards-gamification/</a> [25.08.2023]

Level 5 – Test

Explanation: The results of the previous phases in that stage are converted into a tangible product (prototypes) and tested.

Topics:

- Learning Experience
- Prototyping



**Learning Experience**

	<b>Learning Experience Design (LXD)</b>
<b>Description</b>	Learning Experience Design is derived from the term User Experience. The term user experience can be translated as user experience or user experience and describes all aspects of user satisfaction, accessibility and the pleasure of interacting with a product or learning offer.
<b>Importance</b>	Goals of the Learning Experience: <ul style="list-style-type: none"> <li>• To create positive experiences of users with a teaching-learning arrangement so that a comprehensive engaging user experience of the learning offer can be created.</li> <li>• The experience of positive experiences and feelings such as joy or fun during participation lead to an increase in motivation when engaging with the learning offer.</li> <li>• Achieving the WOW effect.</li> </ul>
<b>Use</b>	Games or playful elements aim to achieve a positive user experience for the player/learner. In order for the integration of games in a teaching-learning arrangement to produce a positive learning experience, the following factors must be taken into account: <ul style="list-style-type: none"> <li>• Learner expectations need to be identified at the outset in order to best meet them to avoid negative experiences.</li> <li>• Expectations include, for example, the usefulness, usability, accessibility and aesthetics of the teaching-learning arrangement.</li> <li>• Participants' goals need to be analysed in different situations.</li> <li>• - The teacher should gain an understanding of the context of use.</li> </ul>
<b>Source</b>	<a href="https://www.youtube.com/watch?v=pt1RC-tKitM">https://www.youtube.com/watch?v=pt1RC-tKitM</a> [25.08.2023]

**Prototyping**

	<b>Prototyping</b>
<b>Description</b>	Prototyping serves as a test run before the game concept is implemented in the teaching-learning settings. The following questions need to be answered: (Is the goal of the game clear? Are the game elements understandable? Is the story consistent? Is the learning content internalised? Does the technology work, etc.) Subsequently, test players generate feedback on the game (e.g. using the Thinking Aloud method).
<b>Importance</b>	Prototyping is an efficient learner-centred method to test game concepts before implementation. Through the iterative process, the learning and playing experience is tested. It also contributes to the continuous improvement and optimisation of the game through multiple test runs.
<b>Use</b>	Prototyping can be used in general with teachers (experts) and/or learners to develop game runs/play scenarios with different materials such as paper, Lego etc.). The entire game run is simulated prototypically, with facilitators providing support. This can be followed by an interview with the players to generate further feedback.
<b>Sources</b>	<p>Olsen, T., Procci, K. &amp; Bowers, C. (2011). Serious games usability testing: How to ensure proper usability, playability, and effectiveness. In: <i>International Conference of Design, User Experience, and Usability</i> (pp. 625-634). Springer, Berlin, Heidelberg.</p> <p>Lim, Y. K., Pangam, A., Periyasami, S. &amp; Aneja, S. (2006). Comparative analysis of high-and low-fidelity prototypes for more valid usability evaluations of mobile devices. In: <i>Proceedings of the 4th Nordic conference on Human-computer interaction: changing roles</i> (pp. 291-300).</p>

Level 6 – Implement

Explanation: Trying out the gamified learning scenario in practice and getting feedback from learners.

Topics:

- Evaluation





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