

Designing gamification for collaborative learning

Gamification in education is application of game principles and game elements in learning environment. The positive trends of implementing the gamification of learning in educational context influence the student behaviour, behaviour changing, and social activities, benefit the engagement, motivation, performance, and learning (Edu Trends, 2016; Wu, 2015).

The gamified content (Edu Trends, 2016)

- motivates the learner to solve an interesting task, enriched with unexpected events and challenges,
- creates an inspiring narrative context with environment, action, protagonists, identities, situation,
- establishes rules in the learning process regarding the time, intuitive behaviour, how to solve micro tasks, and how to gain/lose points, how to save lives, how to complete a mission or a goal
- offers flexibility in learning paths, options in choosing the next step.

Role of educators

The gamified course design involves competition, co-operation, challenge, performance, skills, motivation, strategies, goals, measurement, scores, tracking progress (Kritz, 2021). Aside of creating an entertaining activity, the educators have to align the gamification design with the learning goals. Therefore, the designing process has to ensure that the participation of learners in the learning process involves and stimulates the collaborative learning, the communication and interaction. Accordingly, the characteristics of participants, the difficulty of the content, the beginning level and goal level have to be planned and aligned with the previously defined learning goals.

The educator guides and supports the learners during the learning and monitors the progress of individuals and groups. The evidence and statistics obtained through the technology and active guidance and monitoring enables educators to evaluate the learners in this gamified process of learning. The formative evaluation is strongly connected with the automated feedback, progress, and results of the activities, tasks, quizzes. The formative evaluation has to be unobtrusive in order not to attract attention but to keep focus on the gaming learning process (EduTrends, 2015). In the summative evaluation, at the end of the gamified learning block, the learners show and apply learned content in an activity that enables qualitative performance of knowledge and skills. (Some ideas can be found in the area [Assessment – EDUdig](#))

Gamification mechanics and elements

There are some mechanics for gamification in learning environment, such as feedback, reward, challenge, competition and cooperation (Wu, 2015). The mechanics are rules and settings that are provided by the technology, they define how the participants are engaged in the course, how they receive the feedback and advance in the gamified learning. Also, there are elements (the set of strategies taken form game and applied into the learning environment) like progress, room to make mistakes, visible status, time restrictions, surprise - elements of unexpected (EduTrends, 2015).

Tools - here some possible tools and apps - Learning management system (LMS), [Classroom Jeopardy – Factile](#), [Socrative](#), [Classcraft](#), [Edpuzzle](#), [BookWidgets](#), [JeopardyLabs](#), [Kahoot!](#), [Badge Maker | Adobe Express](#), [Badge Maker](#)

Feedback and progress

In gamified setting, feedback includes points, levels, and some visual symbols of achievements (Wu, 2015), guides the progress of players and influences their behaviour (EduTrends, 2015).

The implementations of feedback and progress in the LMS or apps are points, levels, possibility to see if the answer is right or wrong, possibility to repeat a step, see the progress as visualized progress bar, indications of the difficulty level of an activity, access to a content or the content is blocked (can be accessed if a requirement is fulfilled), see statistics of tries and errors, see achievements in all, leaderboards.

Rewards

Rewards accredit the wanted behaviour in the learning context and mirror the achievements of learning blocks, parts and levels. In a gaming content, it means virtual money or tokens, lives, access items, special powers.

One of the main implementations of the reward are badges and certificates, but also receiving and collecting points and advancing through the levels.

Challenge

Challenges reflect the elements of unexpected in the learning process, where the learners face uncertain or unknowing outcomes in the process. This uncertainty can be a motivational factor to try to overcome obstacles, take an unknown path or reach the next level.

Implementation: different difficulty levels, limited time to perform a task and to perform regular activities in defined period of time (e.g each day one exercise for two weeks), but also the possibility to repeat if error occurs, branching scenario – to choose the next step - [Branching scenario – EDUdig](#).

Competition and collaboration

If students are encouraged to team up, or to collaborate better in the previously defined teams, they can achieve a common goal or solve the task more efficiently or before the other group. This spirit of community motivates the collaboration in the group and strengths the competition among teams. The collaboration enables working together, constant communication, coordination, interaction, and discussion about the next step (Wu, 2015).

Possible gamification of a Moodle course

In the following tables are presented the ideas and possibilities how to integrate gamification mechanics and elements in a Moodle course (Somova & Gachkova, 2016).

GAME ELEMENT	MOODLE ELEMENT
Level	Section of the learning course
Badge	Badge
Reward	Additional learning resource
Points	Grade in points
Rating / Leaderboard	User reports with grades and ranks
Avatar	No realization
Team	Group
Recourse collection	Course resources and activities
Hidden treasure	Hidden learning resources or activities
Game rules	Learning process rules
Progression	Statistics (reports) of the completed learning process

Source: Table 1. Game Elements in Moodle in Somova, E., & Gachkova, M. (2016, September). An Attempt for Gamification of Learning in Moodle. In International Conference on e-Learning (Vol. 16, p. 201).

GAME ACTIVITY	MOODLE ACTIVITY
Accomplishment of personal adventure	Studying learning resources Accomplishment of personal assignment Solving tests (quizzes)
Accomplishment of team adventure	Accomplishment of group assignments
Repetition of adventure	Repetition of learning resource/activity (with permission for repetition) in order to achieve better results (points)
Passage of level	Passage to the next learning section when a given criteria is met
Level repetition	Repetition of learning resources/activities (with permission) in order to achieve missed badges
Obtaining of badge	Obtaining of badges, certifying successfully completion of learning activities and achieving some learning objectives
Obtaining of reward	Obtaining access to additional optional learning material
Obtaining of points	Obtaining points from assessed learning activities
Discover hidden treasures	Opening of hidden or grayed-out learning resources/activities when some other learning resources/activities are successfully completed
Feedback when progression is noticed	Obtaining of badge or points Teacher feedback

Time restriction for accomplishment of adventure	Setting up a time restriction of a learning resource or activity
Personal communication	Chat/forum/shared files with another student or teacher
Common communication	Chat/forum/shared files with other students and teachers

Source: Table 2. Game Activities in Moodle in Somova, E., & Gachkova, M. (2016, September). An Attempt for Gamification of Learning in Moodle. In *International Conference on e-Learning* (Vol. 16, p. 201).

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