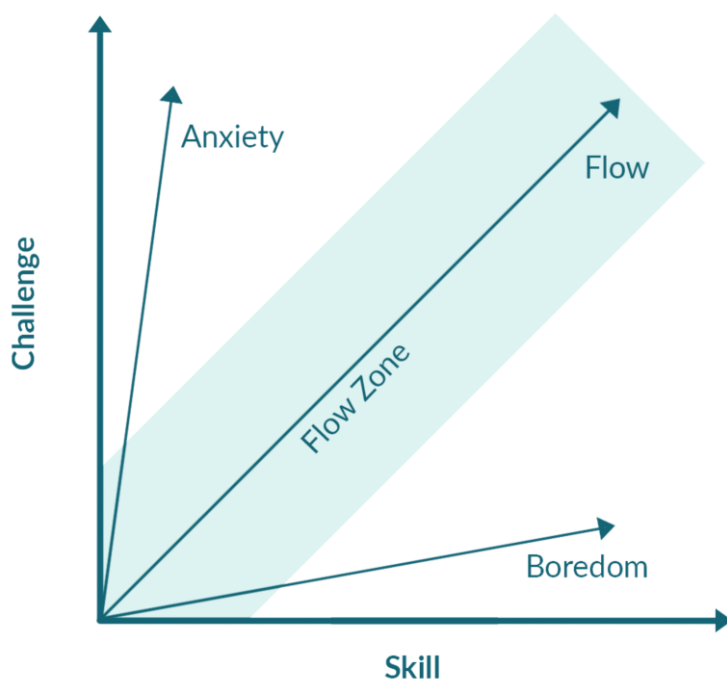


Gamelearn project – 3rd article

Keeping Learners Interested with Flow

A very successful theoretical basis for game approaches in learning is the so-called model of flow. A very popular approach in this field is the flow idea of Chen from 2007 (cf. Chen 2007). In this approach it is important that a player of a game gets in contact with both challenges and skill improvement. The more skills the learner has, the more challenges and problems can be addressed and solved. If players have more skills than they need in the challenges of the game, they will be bored. Otherwise if there are high challenging situations in the game which are not fitting to their skills, there will be anxiety and frustration. For example, if you need to solve mathematical puzzles in a game for learners in high school and all the puzzles only address additions and subtractions on elementary school level, the game will be boring after a while, because the puzzles and challenges will be too easy to solve for the higher skilled learners. And if the same game addresses primary school learners but provides puzzles that require analysis skills to solve them, the young learners may become frustrated and will avoid playing the game, because their skills are not enough to solve the challenges. The flow theory is looking for a balance between the level of challenge in the game and required skills of the player.

The idea of a flow area means that a teacher who uses the game in education has to make sure that the game's challenges match the skill range of the students and keeps them motivated. This is a major requirement for making it possible for them to follow the learning path. The following figure presents the core ideas of this approach:



Skill-challenge relationship (adopted from Chen 2007)



Interestingly, the idea that games are pleasantly frustrating is one of the characteristics found by Gee (cf. Gee 2017). He recognized that games for educational purposes may adjust challenges according to the skill-level of the player. Such games provide feedback concerning the progress the learners or players are making. Games also offer cycles of expertise. By offering options for extended practice and mastery of challenges of tests the player get immediate feedback about his or her current status of expertise. Gee also addressed that games in educational contexts have to be deep and fair. Deep means that a game and its elements must be simple as well as easy to learn and to play before complexity comes in and the game starts to challenge the player in a more demanding, ambitious and sophisticated way. Fairness of a game means that there must always be a way which leads to success (cf. Gee 2017).

The ways that games can react instantly to the performance of the player is a huge opportunity in education and should be a major design element for future development of game-based learning opportunities. Games can essentially collect performance data about the learner, analyze the data, and adjust the learning situation in the game to the needs of the individual learner.

The data collected could be the time it takes to perform a task, a rating of the quality of the task result, choices the learner makes, etc. The longer the player is engaged in the game, the more data can be collected.

The data can then be used to analyze the needs of the learner. For instance, data could be compared to the expected performance or, if games are connected, learner data could be compared with the average of all the other players. Ideally sophisticated learning performance models would be developed and used to understand the strengths and weaknesses of the learner.

Understanding the performance of the learners is key to individualizing the learning situation. This means that the game scenario could raise or lower the difficulty or even change the type of challenge. There is no point in challenging players with tasks that are too difficult or too easy and computers have the huge advantage of being able to react instantly and adjust the learning scenario dynamically.

We can already see this work very well in many entertainment games. Game developers spend a lot of effort and money on developing ways of gradually raising a game's challenge according to the skills of the player. In the field of education we have not been able to keep pace with this development but there is no doubt that this is an exciting challenge for the future which we should take advantage of.

Dissemination

The news and the results of the project will be published on the website of the same, available at this link. <https://www.gamelearnproject.eu/partners>