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► **To cite this version:**

Audun Grom, Gabrielle Hansen, George Adrian Stoica. Gamifying Experiences Using a Peer Learning Assessment System: Combining Two Separate Research Traditions to Promote Student Learning (Poster and Interactive Session). 16th International Conference on Entertainment Computing (ICEC), Sep 2017, Tsukuba City, Japan. pp.507-509, 10.1007/978-3-319-66715-7. hal-01771455

**HAL Id: hal-01771455**

**<https://inria.hal.science/hal-01771455>**

Submitted on 19 Apr 2018

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# Gamifying Experiences Using a Peer Learning Assessment System: Combining Two Separate Research Traditions to Promote Student Learning (Poster and Interactive Session)

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**Abstract.** This demonstration presents a gamifying use of a new assessment technology, the Peer Learning Assessment System (PeLe), in higher education. By implementing key elements from gaming in a traditional assessment practice, using new technology, students can gain a new understanding of what assessment in higher education could look like: engaging, exciting, interactive, fun and rewarding in terms of new learning experiences. Students will assume the role of players in small teams and acquire a sense of competing against other's teams through quiz-based testing. The students will respond to the quizzes using their own mobile devices. The students will automatically be rewarded points for correct answers and deducted points for wrong answers. Upon completion of the test, the results will be reviewed in a plenary session, where the teams will have the opportunity to close the gap between attained and desired achievements. The overall purpose is to combine the best from two separate research traditions, gaming and assessment, and facilitate more engaging assessment in higher education.

**Keywords:** Gamifying experiences · Gamification · Assessments · Quiz · Learning

## 1 Introduction

Gamification, defined as “the use of video game elements in non-gaming systems to improve user experience and engagement” [1], has become a popular technique used in a variety of contexts to motivate people to engage in particular targeted behaviours [2]. In education and employee training, for example, the use of individual game elements is also becoming increasingly popular [2]. The overall purpose is often to provide users with a gamified experience. However, gamified experiences have yet to be accommodated in all parts of the education system. A highly traditional part of this system is assessment practices within higher education. At this educational level, assessment is still considered to be a transmission process in which teachers “give” students feedback on their academic strengths and weaknesses, which students are then supposed to

somehow “decode” and convert into concrete actions to improve their understanding and academic progress [3]. There are few, if any, examples of gamifying experiences to increase students’ engagement. Nonetheless, learning is at its best when it is active, goal-oriented, contextualized and interesting. Instructional environments should thus be interactive, provide ongoing feedback, grab and sustain attention and have appropriate and adaptive levels of challenge — in other words, have the features of good games [4].

## 2 Peer Learning Assessment System

One2act PeLe (Peer Learning Assessment System) comprises three main components: a central REST service that deals with all the requests from the users, a student client account that allows the students to participate using their (own) devices and a teacher client account that allows the teacher to create and control sessions. Typically, the teacher will prepare a set of questions (i.e. an assessment) and will define the correct answer and the scores awarded for each of them. The scoring model in PeLe is quite flexible allowing for both simple and advanced operation. The teacher can monitor the status of the classroom as the students answer and is therefore able to prepare the feedback/discussion/competition phase. The teacher can then show the aggregated results for all or a subset of the questions and discuss the results in a plenary review session. PeLe supports discussion through interactive visualization. Furthermore, it supports re-voting questions from the defined set and creation of new questions as required by the discussion.

## 3 Gamifying Experiences Using PeLe

The students are placed in random teams of three to four players. Each team is given a test with varied quiz questions. First, each player works on the questions individually. This allows the players to process the questions and think through possible arguments for different response options, and thus prepares them for team participation. Then the players will act as a team. Each team must reach an agreement internally within the group before submitting their responses. This is done to emphasize the value of peer collaboration. The teams will be awarded points automatically for correct answers and deducted points for wrong answers. The teacher will have full live coverage of this process.

When the teams have submitted their responses the players will have a short break before they return to the classroom and start a plenary session to review the results. Since the teacher has a clear overview of how each team has performed, he or she can easily identify which areas the students are struggling with and which ones they master, and can then use this information as a guide during the plenary review session. From the students’ point of view, this is when the game really begins. During the review, the players will be given several opportunities to re-vote. In other words, they will have an opportunity to change their original, submitted response. They will be awarded double or triple points compared to what they could gain in the original test. This means that those with the lowest score still have the opportunity to win. The teacher chooses the

questions he or she wants the players to answer again. It could be questions that the teacher knows the players are struggling with, or questions he or she knows they master. The teacher can also show the players how the different teams have responded as a whole. This would obviously be done without revealing what alternative is correct. Furthermore, the teacher can give the players an academic hint or guidance and ask them to discuss the questions within the teams before re-voting. Each team must now evaluate their original response and discuss whether this was actually correct or not, and whether they are willing to change their original response.

After each re-vote, it is critically important that the teacher goes through the quiz questions and explains why the different alternatives are right or wrong, include the teams and their ways of thinking and thus facilitates student participation and learning experiences. At the end of the plenary review session, the teacher announces the winning team, which is the team with the highest score. From a pedagogical point of view, the gamifying elements have been included to engage the students, and the real winners are those who learned through immediate feedback, teachers' guidance, collaboration and increased engagement.

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