

PonG: Parcours on Gamification - How to Get Educators Gamification-ready

Corinna Lehmann, Helge Fischer, Matthias Heinz and Josefin Mueller

Media Design Centre, Technische Universität Dresden, Strehleener Str. 22/24, 01069, Dresden, Germany

Keywords: Gamification Readiness, Gamification Framework, Train-the-Trainer, Game based Learning.

Abstract: This paper introduces the Parcours on Gamification (PonG), designed by the cluster Digital Learning and Gaming Cultures of the Media Centre of the Technische Universität Dresden. The proposed concept encompasses three main ideas. 1) It introduces the concept *Gamification Readiness* for educators as an opportunity to self-reflect on the role and mindset needed to gamify a classroom. 2) It is a workshop concept (train-the-trainer/educator) designed as a game itself that not only helps train educators but combines ideas of game-design thinking with concepts of learner-centered frames. And 3) as a process model, it supports educators to transfer their teaching content into gamified scenarios matched to their general conditions. PonG is also designed to address the use of gamification in contexts independent of the educational institution. By focusing on the trainer/teacher/educator, PonG enables them to adapt their own teaching-learning scenario and enhance it with gamification elements. The main goal of PonG is to support educators to make their classroom a creative playground and learning space by using game elements. As PonG is still in progress, the paper gives an overview of its current development.

1 INTRODUCTION

Games or single game elements do not only offer entertainment but are also suitable for teaching to motivate the learner. However, a look at educational practice shows that educators are hesitant when it comes to the use of game elements in formal education in schools or institutions of higher education. Many teachers and lecturers are often sceptical about the possibilities of gamification or don't feel gamification-ready. The Parcours on Gamification (PonG) is a train-the-trainer-concept that aims to rediscover play as an intuitive learning method, to expose games as a didactical method and to support its transfer into classrooms. To increase the intrinsic motivation of its participants the workshop concept is designed to enable the participants to learn about gamification through a gamified learning environment, divided in different stages (Parcours).

Starting with defining specific terms with regards to gamification, this paper focuses on introducing *Gamification Readiness* of educators, the change within the mindset of educators, and essential competencies to gamify a classroom. In the third section the PonG is defined and delineated and includes an examination of its didactical basis. The

last section sums up this paper and gives a short outlook on future steps.

1.1 Play, Game, Game-based Learning and Gamification

To begin, defining the terms play, game, game-based learning and gamification is essential, as these terms are to be understood very differently. The origin of learning through playing goes way back. In 1938 Johan Huizinga introduced the concept "homo ludens" proposing that humans develop cultural habits and understanding through playing as well as they discover their own personality by making experiences through play. "In play there is something 'at play' which transcends the immediate needs of life and imparts meaning to the action. All play means something" (Huizinga, 1951, p. 1). Huizinga therefore characterises play as follows: "The need for it is only urgent to the extent that the enjoyment of it makes it a need. Play can be deferred or suspended at any time. It is never imposed by physical necessity or moral duty. It is never a task. [...] it is free, is in fact freedom. [...] that play is not "ordinary" or "real" life. It is rather a stepping out of "real" life into a temporary sphere of activity with a disposition all of

its own” (1951, p. 8). In contrary, the term “Game can be defined as: A system in which players engage in an abstract challenge, defined by rules, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction” (Kapp, 2012, p. 37). So game is, compared to play, a system where rules are predefined to challenge the participant in a pretended way. Guided by feedback a behavioural change is the main and pre-set goal. But nevertheless, game, as well as play, should be enjoyed by the participant, should be able to transfer its content into a fictional world and should activate. The evolution of digital technologies and with it the evolution of video games has lead to a “growing acceptance of digital games as mainstream entertainment [and] has raised the question of how to take advantage of the promise of digital games for educational purposes” (Plass et al., 2015, p. 258). This is the main idea of Game-Based learning.

Kapp et al. define gamification as “Using game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems [...]” (Kapp et al., 2014, p. 410). Whereas Deterding et al. use Gamification as “[...] the use of game design elements in non-game contexts” (Deterding et al., 2011, p. 9, italic in original) and emphasize a design focus and equate gameful design with gamification. As the proposed *Parcours* aims to increase the use of game (design) elements within educational institutions, both definitions draw a frame around the topics educators need to go through.

1.2 Not All that Glitters is Gold

In addition, as the *Parcours on Gamification (PonG)* draws a holistic picture of its topic, it also highlights possible side effects, e.g. the effect on the learner’s motivation. Gamification is mostly focused on positive effects, which makes the research gap on negative effects visible (Koivisto & Hamari, 2019). In a literature review of 386 papers, Majuri, Koivisto and Hamari (2018) found that most studies on Gamification are mainly positively oriented (297), 74 are null or equal positive and negative, and just 15 are mainly negatively oriented. Most studies report on the addorance points, score, XP (52); leaderboards, ranking (43); badges, achievements, medals, trophies (39) and challenges, quests, missions, tasks, clear goals (37), while the most negative quantitative were leaderboards and ranking with 3 out of 43 (Majuri, Koivisto & Hamari, 2018). In general, there are a lot of studies on gamification design, but a big gap when it comes to considering negative effects (Toda, Valle

& Isotani, 2018). There is only one study about negative effects of gamification in an educational context by a systematic mapping, which classifies the negative outcomes and identifies the gamification design (Toda, Valle & Isotani, 2018). Toda, Valle and Isotani (2018) identified the four negative effects to include loss of performance (identified in 12 studies), undesired behavior (9), indifference (5) and declining effects (5). The identified game elements influencing negative effects are (Toda, Valle & Isotani, 2018): Leaderboards (identified in 14 studies), badge (13), point (12), level (9), progression (4), social status (4), instant feedback (3), avatar (3), social interaction (2), economy (1), challenge (1) and narrative (1). The concentration on the Point-Badge-Leaderboard (PBL) approach is visible and influences most of the game designs, which makes the consideration of individual profiles, instructional and motivational design theories necessary (Toda, Valle & Isotani, 2018). This is what *PonG* has to consider as well, in order to allow a realistic view on the potentials of gamification in the classroom.

2 ARE EDUCATORS READY FOR A ROLE-CHANGING GAME?

It is fundamental for educators to think about the transition of their role before starting to gamify a classroom. They need to be ready to gamify. This term – Gamification Readiness – combines the needed intrinsic motivation of educators for using game elements, having the ability to think outside the box and implement ideas creatively as well as the knowledge on gamification. In a study by Mueller (2019), four main competencies could be detected - openness, creativity, holistic thinking and expertise - and are explained in the following section. *Gamification Readiness* relies on these competencies as a foundation and works to expand them.

2.1 Knowledge is Power

Playful learning can create new demands in the field of education while at the same time work to support learning process. Therefore, educators are faced with the challenge of designing creative game scenarios on the one hand, and integrating the desired learning contribution, as well as the overall educational objective on the other. For the playful imparting of learning content in order to keep the students motivated and promote their learning process, specific skills are required.

To determine which competencies educators are specifically required for the use of gamification, an empirical study was conducted between May and August 2019. The aim of this study was to outline an exemplary competence profile, which provides information about the concrete skills and abilities educators need to develop and implement for gamification. A qualitative method was chosen for the empirical study, because there is little previous knowledge on the topic in literature and research. Therefore, expert interviews were conducted to obtain first results based on the experience of the experts. In interviews of about 30 minutes six experts were interviewed for this purpose. The sample consisted of lecturers, project leaders and academic staff who all are experienced in the development of game-based applications and/or whose teaching and research focus is on gamification and game-based learning. The basis for the interviews was a previously designed guideline which consisting of four guiding questions. In addition to the interviews, which were the primary source of data, a short questionnaire was developed, which had to be completed immediately after the interviews. The questionnaire was based on the Competence Atlas by John Erpenbeck and Volker Heyse (Heyse & Erpenbeck, 2009, p. XIII). The scientists divide competences into four basic competences, which they differentiate again into 64 sub-competences. Using the Competence Atlas, respondents should explicitly name the competences they consider important for the use of gamification.

To analyse the data material, the interviews were first transcribed and then evaluated using the qualitative content analysis by Kuckartz (2018). In seven steps, the interview texts were initiated main and sub-categories were formed deductively and inductively, coded at the material, differentiated and bundled. The evaluation and analysis process was carried out by using the MAXQDA software. Due to the small amount of data, the questionnaire was evaluated with Excel. For this purpose, the results were summed up and tabulated.

Based on the experience and information provided by the experts, the following competencies and prerequisites for the use of gamification were identified from the interviews and the questionnaire.

Openness, Readiness for Change: Ability to understand change as a learning situation and to act accordingly; Being open to change, to new forms of teaching and learning; Replacing old learning formats; Ability to leave room for new reference points; Adapt its actions to the changes; Acquiring the resources necessary for change; Learning new tasks

and dealing with new technologies; eager to try out new things.

Creativity: Ability to develop good and preferably novel solutions to problems; Readiness to innovate; Creation of something new and originality.

Comprehensive/Holistic Thinking: The ability to incorporate other aspects into one's own objectives and decision-making on the basis of sound knowledge; Comprehensive view; Overview of the entire concept; Consideration of diverse interdependencies and other persons involved.

Expertise, Interdisciplinary Knowledge: Specific knowledge about learning and games and the ability to apply this knowledge; Know different types of learners and players; Knowledge about the characteristics of the game (game mechanics, flow experience, incentive systems, game elements); Consider different forms of learning (situated, action-oriented learning); Integration of different constructs and concepts for learning transfer (learning and motivation theories, situated and action-oriented learning); Media didactic knowledge.

Playing is fun. Playing motivates. In this way, an interactive playful design and transformation of the game elements into the real world can promote the motivation and consequently the performance of the students. Therefore, educators should replace traditional teaching methods and be open to new ideas in order to create new ways of teaching and learning. In terms of gamification, this requires not only a comprehensive overview, but especially creativity, e.g. in storytelling. In addition, a general basic understanding of games and game elements is required and how these can be used in a targeted manner. The listed competences are the first step towards gamification.

2.2 Introducing Gamification Readiness

As stated before, *Gamification Readiness* is a consumption of different concepts. Currently, as this framework is still a work in progress, describing Gamification Readiness focuses on the results of the study by Mueller (2019) as well as on the concept of "Visible Learning" by John Hattie as this last one postulates the general switch within the role of educators: "It is less what teachers do in their teaching, but more how they think about their role. It is their mind frames, or ways of thinking about teaching and learning, that are most critical" (Hattie, 2015, p. 81). From his paper "Rankings and Effect-Sizes for 195 Influences on Student Achievement"

(Hattie, 2015) a few can be applied also to the educators mindset needed for gamifying learning content as shown in table 1.

Table 1: Influences on Student Achievement according to Hattie transferred to *Gamification Readiness*.

Influences on Student Achievement	Transformation to Gamification Readiness
Teacher estimates of achievement	Define the goal of game
Classroom discussion	Solving a task together while playing
Teacher clarity	Give clear rules/goals
Creativity programs	Being creative in transferring learning outcomes

Gamification Readiness, therefore, emphasizes the following summarized characteristics:

- Being able to describe clearly the rules of a game as well as the intended learning outcome including the impact for the student is evident.
- Being able to not show the learning path but to guide learners on their self-chosen paths. Being able to let go of past ways of teaching.
- Being able to communicate that mistakes are good.
- Being able to think creatively.
- Being able to give individual and prompt feedback.

As *Gamification Readiness* is an important part of the PonG, future work will lead to more detailed competencies and descriptions.

3 CREATING A PLAYGROUND

PonG is all about being able to experience these competencies through playing as well as getting to know detailed information on how to use them for the gamification of classrooms. In summary:

- PonG is intended for train-the-trainer qualifications.
- It leads educators through steps of gamification, e.g. how to create a gamified lesson or lecture.
- One of the main characteristics of PonG is that it inherently gamified as well. Hence, educators are able to gain gaming experiences (positive/negative) in the sense of a guided self-reflection. This is needed for a learner (participant/student/pupil) centered perspective during their own conception process.
- PonG is broad reaching, i.e. expandable. Participants get to know the basic paradigms, phases and steps to gamify a classroom, but there

is room left for individual extensions, e.g. the use of special technologies, for instance a specific learning management system.

- PonG is a meta-framework, which takes up and integrates existing frameworks and concepts or their elements.

3.1 There is No Reason to Reinvent the Wheel

According to a non-representative literature review on gamification of classrooms, game-based learning models and gamifying learning content, structural models as well as process models were researched. For instance, the Mechanics, Dynamics and Aesthetics (MDA) Framework “attempts to bridge the gap between game design and development, game criticism, and technical game research” (Hunicke et al., 2004, Abstract). It is a structural model where games are to be seen as artefacts designed to create behaviour via interaction. Therefore, the MDA framework “formalizes the consumption of games” into three components: rules, system and fun and establishes “design counterparts” for each: Mechanics, Dynamics and Aesthetics (Hunicke et al., 2004, section MDA). As a result, the MDA framework also points out two perspectives: the designer’s perspective and the one of the player. Designers have a look at mechanics first, the other two (dynamics and aesthetics) are their product. Whereas, players experience the aesthetics first which “set the tone” (Hunicke et al., 2004, section MDA in Detail). Other models that also follow the direction of a structural model are, for example, the frameworks by Chou and Kapp, as you can find in the systematic review of gamification design frameworks by Mora et. al (2017)

In contrary, the Learning Mechanics-Game Mechanics (LM-GM) framework can be classified between a pure structural and a pure process model as it points out a “set of pre-defined game mechanics and pedagogical elements” that help designers and analysts to “identify and highlight [...] main pedagogical and entertainment features [of the game]” (Lim et al., 2013, Abstract). Resulting in a map, all learning mechanics and gaming mechanics are matched, therefore be identified and help analyse their relationships. It works as a basis for further steps and for a process of creating a game.

In contrast Baldeon et al. introduced A LEarner-centered GAMification Design Framework (LEGA), which takes into account that “game-based thinking and game mechanics within the classroom” needs to focus on “educational aspects such as intended

learning outcomes [...], learning styles [...], learning activities [...] and learning mechanics [...] (Baldeon et al., 2016, Abstract). Unlike the LM-GM framework LEGA aims to guide teachers through a process starting with their intended learning outcomes and learning activities and transfer these into “suitable gamified learning mechanics” (Baldeon et al., 2016). Within this category Marczewskis (2014) frameworks can be named as well, because it is a useful guide to approach the topic of gamification. Other models that need to be considered in future work are shown in Kim and Lee (2015) as well as in Wongso, Rosmansyah and Bandung (2014).

3.2 Using Design Thinking as Core of PonG

The frameworks mentioned above represent three thematic focuses that are to be addressed in the PonG: 1) developing a game or incorporating game elements, adopting different perspectives (designer and player/learner), 2) creating a balance between playing and learning, and 3) instructions for implementing learning goals through play (as a whole game or using game elements). As this paper shows the state-of-the-art, these subjects will be extended within the future work.

In order to put these thematic focuses into a creative workshop-context, the method of design thinking will serve as a template for the stations of the PonG. Design thinking is a creative and problem-solving method, which focuses on collaborative works and triggers solutions by changing the points of view. This method helps educators to get into a creative process where they get to experience the switch into the role of the learner (dSchool, 2010). Design thinking also helps educators to identify their own learning goals and define learning outcomes as well as to creatively discover how to meet them. A peculiarity of design thinking results from its dynamics. The rigid sequence of linear development processes becomes an iterative procedure, with the learner in the center, as for instance the use of design thinking methods for learner experience in game based learning projects (Schade et. al (2019). The development of gamification scenarios should not only convey knowledge, but also arouse positive emotions, which require a strong orientation of development processes to the individual requirements of the learner and the characteristics of the learning environment. Therefore, the current work is to translate the stages of design thinking into the intended Workshop stations and to gamify them.

As follows, the six stages are introduced as well as methods/items are listed that are to be taught to educators during PonG. Cited research works exemplify the scientific basis for every stage.

Understand: An effective method can only be found if the learning situation has really been understood. That is why the first step in design thinking is to understand the situation. Methods/Items: Stakeholders and their relation; learning environment and technical equipment; needs and expectations. Example for scientific basis of this step: user analysis (Morschheuser, Werder, Hamari & Abe, 2018)

Empathize: In the second phase, the aim is to find out the needs, fears, perspectives and emotions of the people involved in the learning situation. Methods/Items: Player type and learning style (learner); teaching style, *Gamification Readiness*, resources (teacher). Example for scientific basis of this step: Marczewski, 2014. Gamification Framework.

Define: In this phase, the most important insights from the first two phases "understand" and "empathy" are merged to derive requirements. Methods/Items: Learning goals and learning journey; curriculum and learning content. Example for scientific basis of this step: Bloom's Revised Taxonomy.

Ideate: The systematic development of ideas is one of the most important phases in the development of gamified learning arrangements. Methods/Items: Game elements and game strategies; balance between game and learning mechanics; tools and infrastructure. Example for scientific basis of this step: GameFlow (Sweetser & Wyeth, 2005); Key Characteristics of a Learning Game (Malone, 1981).

Prototype: Prototyping is at the heart of the creative process. The results of the previous phases in that stage are converted into a tangible product. Methods/Items: Visualisations and role play; paper and digital Prototypes; learner feedback. Example for scientific basis of this step: Prototype development (Schade, Heinz, Fischer & Schulz, 2019).

Implement: The implementation phase is about trying out the gamified learning scenario in practice and getting feedback from learners. Methods/Items: User tests and user statistics; Evaluation and assessment; Observation and reflection. Example for scientific basis of this step: Evaluation and user statistics of a gamified service (Heinz, Fischer, Heitz & Breitenstein, 2018).

3.3 Learning about Games by Playing Them

The PonG is designed as a Parcour of games, so participants learn about gamification while they play games. To illustrate this, the station empathize is taken as example. "Empathy is the foundation of human-centered design. The problems you're trying to solve are rarely your own, they're those of particular users. Build empathy for your users by learning their values" (dSchool, 2010). Supported with papers, scissors, pens, glue, etc. participants of PonG will design personas, including their identity and information about their life (age, profession, hobbies, favourite food, needs, fears, etc.). In role-plays one participant puts himself/herself in a persona and can be interviewed by the others. The aim is to get a detailed picture of the target group and its environment, probably some inside information that help to understand the learners, including their needs and difficulties. Another option is to introduce participants to the Gamification Player/User Types HEXAD Model by Marczewski (2014) and characterise every player-type in detail. Afterwards the participants play the well-known board game "Mensch ärgere dich nicht" (board game "Ludo"), whereby each person embodies a different player-type and lives it out in the game.

4 CONCLUSIONS

The use of game elements in non-gaming contexts allows new didactical and motivation horizons that promise a high potential also in the education sector, independent of the educational institution. In order to exploit this potential, the PonG will focus on educators as the "executing" stakeholders. The aim of PonG is to give them the opportunity to learn about gamification while experiencing a gamified workshop. PonG tries to go a new way, in which different topics (also critical points concerning gamification) are explored by the educators themselves using the creative method of design thinking. The special focus on *Gamification Readiness* allows teachers to reflect on whether the needed competencies, mindset and change of role can be carried into the classroom. Future tasks will be to develop more items for all stages, relate scientific approaches to each item as well as to transfer every stage into games. In the second half of 2020 the concept will be tested in pilot workshops, e.g. at the Hochschuldidaktisches Zentrum Sachsen (didactic centre for institutions of higher education in Saxony,

a German federal state). The evaluation after every trial will show, if the concept is working and what to improve. By this iterative process, with the scientific literature on frameworks and within the cluster Digital Learning and Gaming Cultures it should be possible to create an adequate workshop for educators to sensitive them for the use of game elements in learning environments, and as a consequence, to make them gamification ready.

REFERENCES

- Baldeon, J., Rodriguez Santiago, I., Puig, A. (2016). *LEGA: A Learner-centered GAMification Design Framework*. Retrieved January, 15 2020 from https://www.researchgate.net/publication/311317334_LEGA_A_LEarner-centered_GAMification_Design_Framework (15.01.2020)
- d.school (2010). *An introduction to design thinking process guide*. Hasso Plattner Institute of Design at Stanford. Retrieved February 7, 2020 from https://static1.squarespace.com/static/57c6b79629687fde09a0fdd/t/5b19b2f2aa4a99e99b26b6bb/1528410876119/dschool_bootleg_deck_2018_final_sm+%282%29.pdf
- Erpenbeck, J., Heyse, V. 2007. *Die Kompetenzbiographie: Wege der Kompetenzentwicklung* (2. Ed.): Waxmann. Münster, Germany.
- Hattie, J., 2015. The applicability of Visible Learning to higher education. *Scholarship of Teaching and Learning in Psychology*, 1(1), 79–91.
- Heinz, M., Fischer, H., Heitz, R. & Breitenstein, M. 2018. Gamified Study Assistance - Motivational Design For First-Year-Students. *Proceedings of IAC in Dresden 2018*. Prague. Czech Institute of Academic Education z.s., S. 111-117.
- Huizinga, J., 1951. *Homo Ludens: A Study of the Play-Element in Culture*. Retrieved February 7, 2020 from: http://art.yale.edu/file_columns/0000/1474/homo_ludens_johan_huizinga_routledge_1949_.pdf
- Hunicke, R., Leblanc, M.G., & Zubek, R., 2004. *MDA: A Formal Approach to Game Design and Game Research*. Retrieved January, 10 2020 from <https://users.cs.northwestern.edu/~hunicke/MDA.pdf>
- Kapp, K.M., 2012. *The gamification of learning and instruction: Game-based methods and strategies for training and education*. Pfeiffer. San Francisco, USA.
- Kim, J.T., Lee, W. 2015. Dynamical model for gamification of learning (DMGL). *Multimedia Tools Appl.* 74, 8483–8493.
- Koivisto, J., & Hamari, J., 2019. The rise of motivational information systems: A review of gamification literature. *International Journal of Information Management*, 45, 191-210.
- Kuckartz, U., 2018. *Qualitative Inhaltsanalyse. Methoden, Praxis, Computerunterstützung* (4. Ed.): Beltz Juventa. Weinheim, Germany.

- Lim, T., Carvalho, M.B., Bellotti, F., Arnab, S., Freitas, S.D., Louchart, S., Suttie, N., Berta, R., & Gloria, A.D., 2013. *The LM-GM framework for Serious Games Analysis*. Retrieved January, 10 2020 from https://seriousgamessociety.org/wp-content/uploads/2016/09/lmgm_framework.pdf
- Majuri, J., Koivisto, J., & Hamari, J., 2018. Gamification of Education and Learning: A Review of Empirical Literature. In *Proceedings of the 2nd International GamiFIN conference* (pp. 11-19). (CEUR Workshop Proceedings; Vol. 2186). CEUR-WS.
- Malone, T.W. 1981. Toward a Theory of Intrinsically Instruction. *COGNITIVE SCIENCE*, Vol. 5, Issue 4, October 1981 (333-369).
- Marczewski, A. 2014. *Gamification Framework*. Retrieved February 27, 2020 from <https://www.gamified.uk/gamification-framework/>
- Morschheuser, B., Hassan, L., Werder, K., & Hamari, J. 2018. How to design gamification? A method for engineering gamified software. *Information and Software Technology*, 95, 219-237. <https://doi.org/10.1016/j.infsof.2017.10.015>
- Mora, A., Riera, D., González, C. & Arnedo-Moreno, J. 2017. Gamification: a systematic review of design frameworks. *Journal of Computing in High Education*, 29, 516–548.
- Mueller, J., 2019. *Konzeption eines Kompetenzprofils für Spiel- und Lerndesigner*. Unpublished master thesis. Technische Universität Dresden. Dresden, Germany.
- Plass, J. L., Homer, B.D., Kinzer, C. K., 2015. Foundations of Game-Based Learning. *Educational Psychologist*, 50:4, 258-283. Retrieved February 7, 2020 from: <https://www.tandfonline.com/doi/pdf/10.1080/00461520.2015.1122533?needAccess=true>.
- Sweetser, P., Wyeth, P. 2005. GameFlow: a model for evaluating player enjoyment in games. *ACM Computers in Entertainment*. Vol. 3, No. 3, July 2005.
- Toda, A., Valle, P. H. & Isotani, S., 2018. The Dark Side of Gamification: An Overview of Negative Effects of Gamification in Education. In Cristea, A., Bittencourt, I. & Lima, F. (Eds.), *Higher Education for All. From Challenges to Novel Technology-Enhanced Solutions*. Proceedings of the First International Workshop on Social, Semantic, Adaptive and Gamification Techniques and Technologies for Distance Learning, HEFA 2017, Maceió, Brazil, March 20–24, 2017, Revised Selected Papers (pp. 143-156). *Communications in Computer and Information Science*, vol. 832. Springer. Cham, Germany.
- Schade, C., Heinz, M., Fischer, H. & Schulz, S. 2019. Between Learning Objectives and Learning Experience: Methods for the Development of Game Based Learning Scenarios. In L. Elbæk, G. Majgaard, A. Valente & S. Khalid (Ed.), *Proceedings of the 13th European Conference on Games Based Learning*, 3-4 October 2019, The University of Southern Denmark Odense, Denmark (S. 605-613). Reading, UK: ACPI.
- Wongso, O., Rosmansyah, Y., & Bandung, Y. 2014. Gamification framework model, based on social engagement in e-learning 2.0. *2nd International Conference on Technology, Informatics, Management, Engineering & Environment*, 10-14.