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TradeAway learning game project – A fun and collaborative way of learning game design and development, international business and entrepreneurial mindset in innovative knowledge communities

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Learning games and game-based learning have been taken into use in various fields of education. Even though the use of learning games has been widely studied, not enough is known about how to pedagogically design game development projects as learning environments. The development and design projects of games offer great potential and opportunities for learning across fields, such as information technology, business, and game design, etc. The working life of today and future call for multidisciplinary and collaboration skills, which need to be developed during formal education. Collaborative learning projects offer an authentic environment for learning these skills. In this paper we present the development and reflections on a pedagogical model involving a collaborative learning game design and development project. Our research question is: *How the game design and development project can serve as a collaborative learning environment?* In our study we had two goals: 1) to develop and experiment a pedagogical model based on collaborative game development, and 2) to develop and test the learning game itself, targeted for learning international business and trade.

Students of a university of applied science designed and developed, guided by the university teachers, a mobile learning game as a learning project. The game design and development project formed the learning environment for the students and other collaborators. The learning environment and the pedagogical model were developed by the teacher-researchers in parallel with the implementation of the game design project.

Theoretical framework

At Laurea University of Applied Sciences, we apply the Learning by Developing (LbD) Action Model, which is based on the pragmatic learning theory and integrates competence producing learning and an innovative R&D project. The defining characteristics of the LbD are authenticity, partnership, trust, creativity and an investigative approach. (Raij 2014, 15, 103.) Through action research, one of the implementations of the LbD, the P3P model has been developed further from Laurea's LbD pedagogy and Peer to Peer (P2P) learning environment

by Laurea's lecturer-coaches, students, and collaborating entrepreneurs and other actors during several development projects. (Kuhmonen & Pöyry-Lassila, 2015, 46.)

The P3P pedagogical model is based on the theories of trialogical learning and innovative knowledge communities IKCs). To succeed trialogical learning requires four elements: (1) individuals with their ideas and personal knowledge and expertise, (2) a community consisting of individuals interested in participating in deliberate knowledge advancement, (3) a shared space for collaboration, and (4) shared objects (ideas, practices, and knowledge artifacts) that are developed collaboratively, and that mediate the knowledge-creation process of the community (Paavola & Hakkarainen, 2005). These four elements are present in the P3P learning environment and pedagogy and enable the trialogical learning process and learning the proactive entrepreneurial mindset. (Kuhmonen & Pöyry-Lassila 2016, 193.)

The P3P learning environment provides fruitful conditions for the formulation of innovative knowledge communities (IKC), the development of shared expertise, and co-creation of innovations. The P3P model responds to the challenge of the changing of the role of the universities of applied sciences in Finland as facilitators of learning and networkers that ensure individual career paths for students. The cooperation in the P3P model is based on mutual trust, commitment, support, and taking responsibility. The statements of the students in the evaluation discussions indicate that the fact that the responsibility and space for creativity is given to the students and the feeling that they are trusted, both increases the students' belief in their own capabilities and improves their self-confidence, which is important for their future careers and taking responsibility for the development of their own life. (Kuhmonen, Kujanpää & Pöyry-Lassila, 2015.)

The 21st century workplaces call for an entrepreneurial attitude, skills and spirit (Llopis 2013). In the P3P model, all actors participate actively in the collaborative problem-solving and learning process: entrepreneurs, specialists, students, and lecturers all act, develop and learn together. The educational target of the P3P model is to facilitate the development of the students' entrepreneurial mindset. The students implement the development project in close interaction with the entrepreneur or other collaborating partner, guided by the lecturer-coaches, whose role is to facilitate the progressive learning process, and act as experts, preparers, implementers, evaluators, and networkers (Raij 2014, 113). By participating in the P3P projects, the lecturer-coaches are encouraged to redefine their roles as teachers and the pedagogical skills towards supporting the sharing of expertise and the co-creation of knowledge in a multi-actor collaboration.

We approached the learning game design and development project TradeAway with the help of trialogical learning theory and the concept of an innovative knowledge community (IKC). Learning games diversify teaching and make more innovative pedagogic approaches possible. Games create a more motivating learning environment than traditional lectures. In the TradeAway project, the learning IKC consisted of Laurea's business students, Metropolia Game Studio's game design students (coders), mentors of international trade and innovation, entrepreneurs as consultants, and Laurea's teachers.

The second level of using games as a learning environment is the game design and development, where students learn by developing a learning game. Here the game design and development project serves as a learning environment that follows and extends the LbD/P3P pedagogical model. Our experiences indicate that the collaborative game development environment motivates and enables multi-disciplinary learning among the students. In addition, multi-disciplinary and international collaboration between teacher-researchers is enabled.

The case study

In this paper we describe how the game development project served as a learning environment. First, we will describe how the TradeAway learning game itself was created as a learning project, and second, the development of the learning environment is described.

TradeAway game development project

TradeAway is a learning game that focuses on the international export trade and matters related to international business transactions, such as risk management. The player does business with a number of buyers from different countries by choosing the method of payment, delivery clause, and the mode of transport, and then negotiates the price for the deal. The game is targeted to university and high school students planning careers in international business, and SME representatives. The game's main purpose is to inspire and spark up interest towards international trade. Because the game is designed to be fun and easy to play, it aims to inspire the players to look for more information about international trade to deepen their knowledge.

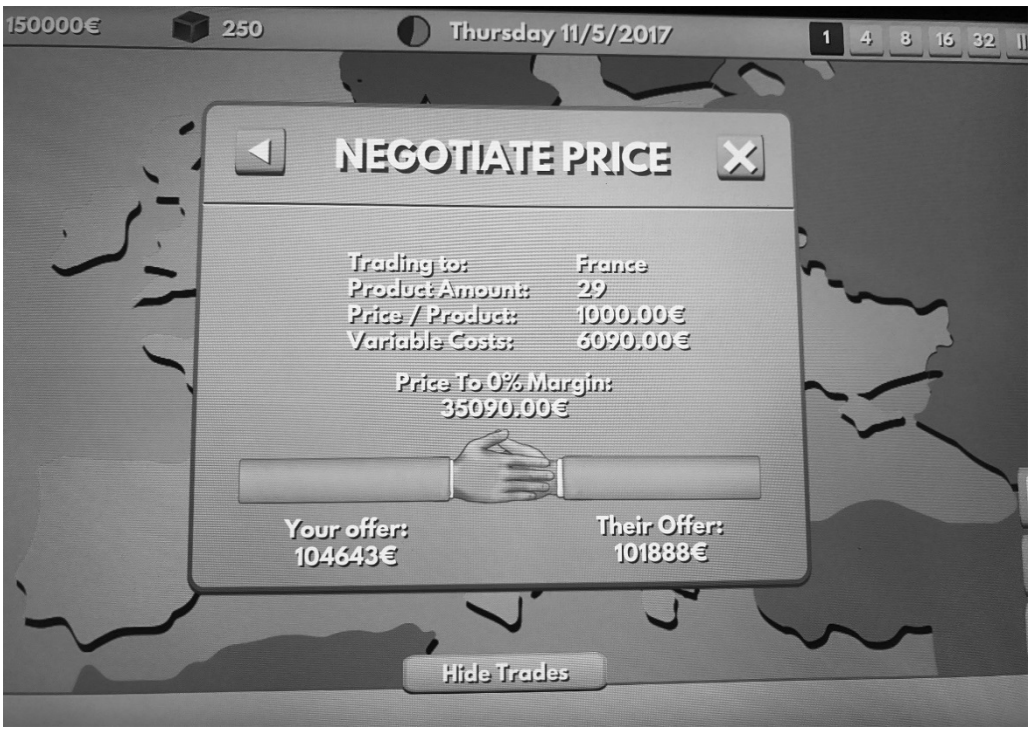

Figure 1. The TradeAway game

The idea for a learning game about international export trade related risks was created by Laurea University of Applied Sciences Hyvinkää Campus project management student group in spring semester 2015. It was based on a publication, a guide targeted to SMEs about international trade. During the spring 2015, the initial game idea was developed into a PowerPoint prototype under supervision and guidance of Laurea's teaching staff.

The PP prototype was then used for designing the basics of a mobile learning game by a new student project group in 2015 autumn semester. The playable Android based mobile learning game prototype was ready in February 2016 after 6 months of developing and testing. It was created in close cooperation between Laurea UAS student project group and Metropolia UAS Game Studio student group. Teaching staff in both universities supervised and guided the development work. Both teams were mentored by Pekka Heino, Senior Advisor in Trade Finance, International Chamber of Commerce (ICC). During the project, the game was tested by entrepreneurs, experts, students and teaching staff. The current game prototype includes

working game mechanics, seven different countries to make trades with, and basics about export trade finance, such as payment methods, delivery clauses, and risks.

Since March 2016, new Laurea student project groups have been planning the further development of the game under the direction of Sudhanshu Rai, Associate Professor of Innovation from Copenhagen Business School in the workshops focused on the story-telling and game architecture. The goal of the development work is to produce a complete game product where education and play are carefully balanced.

During the spring semester 2016, the project team also started cooperation with Lauttasaari High School for International Business, where Laurea business students organized a workshop. The main objective for the workshop was to test the game in a real life educational situation. In addition, the objective was to find students interested in joining the game development collaboration. The game was also tested by Laurea's law students as a part of their business law course to get ideas about integrating agreement negotiations in the game. In 2017, the game development project has progressed with new iterations.

Development of the learning environment

The learning environment and the pedagogical model were developed following the design-based research method (eg., Barab & Squire 2004; Barab 2006). The research and development of the pedagogical model and learning environment was done simultaneously. Design-based research is iterative; the interventions or pilots developing the pedagogical model and practices build on the results of the previous interventions/pilots. Design-based research is preferably conducted in real-life situations to ensure that the contextual factors affecting the learning process are taken into account.

We approached the learning game design and development project TradeAway with the help of trialogical learning theory and the concept of an innovative knowledge community (IKC) and the P3P pedagogical model. Learning games diversify teaching and make more innovative pedagogic approaches possible. Games create a more motivating learning environment than traditional lectures. In the TradeAway project, the learning IKC consisted of students from two universities of applied science, namely, Laurea's business administration students and Metropolia University of Applied Sciences' Game Studio's students (coders), mentors of international trade and innovation, entrepreneurs as consultants, and Laurea's teachers.

All actors participated actively in the collaborative problem-solving and learning process. The shared object of development was defined at the beginning of the project. In this project, the shared object of development was to design and develop a fun and motivating learning game that inspires and sparks up interest towards international business. The students' role was to take active initiative in implementing the task as team members. Business students' were responsible for managing the project and producing the international business contents to the game, while ICT students concentrated on game design. Senior Advisor's role was to act as a mentor, and the entrepreneurs acted as consultants for the learning project. The teachers' role was to facilitate and support the learning process through intensive guidance. The teachers had a double role: they both taught the students and tutored the learning projects, and also acted as action researchers developing and researching the learning environment. Teachers also acted as networkers, experts, and evaluators. As a result, all participants were involved in the knowledge creation process, and they all learned through advancing knowledge and practices. The learning environment formed also a good platform of transferring tacit knowledge. In addition, the process supported learning between generations.

Reflections

Our observations and experience indicate that from an educational point of view, learning by playing is a great way to get the players to internalize the knowledge they have learned and to practice the theoretical knowledge in an almost authentic context. The player can utilize theoretical knowledge and apply it in practice in a risk-free simulation environment. Through the practical, hands-on approach to learning, the game enables profound learning experiences. Competing solutions for this game are online courses, seminars, traditional learning methods, books, and consulting, although they provide linear and more one-way learning. The game by nature offers a more experimental way of learning as well as dialogical and trialogical learning (e.g. Hakkarainen et al. 2011).

The game makes engaging learning possible. Engagement, motivation and flow are the key factors in creating durable learning experiences, specifically in acquiring new skills and knowledge. According to Lauri Järvilehto (2014), learning can be intrinsically rewarding and even fun when your teachers and peers are passionate about the content. One way Järvilehto encourages to "rediscover the fun of learning" is by turning learning into a game, where players are self-motivated to persevere.

Engaging Learning Environment (ELE) is a holistic model of designing new learning environments. It is a synthetic model of innovative learning and instruction that depicts learning as an iterative and cyclic knowledge advancement process. It involves an iterative process of: 1) diagnosing current knowledge and activating a meaningful context to guide and direct learning, 2) going through and facilitating various inquiries in which new knowledge and understanding is produced, and 3) assessing learning gains and knowledge produced so as to engage the participants in an expanding learning and inquiry cycle. (Lonka, K. 2015.) The collaborative game development project can be seen as an Engaging Learning Environment for the students.

According to our experience, we argue that active interaction is a prerequisite for a successful game design and development project since it facilitates and supports the learning and sharing of expertise. For the business students the expertise might mean fresh business knowledge about international trade or game innovation. From the mentor's point of view, the change of ideas with young generation is rewarding and facilitates future orientation of the expertise. For the mentor, the share of expertise means also the sparking up the interest of the students towards the international trade. When thinking "outside the box", students boost new ideas and innovations. – The whole process of designing and developing of TradeAway can be considered a collaborative learning process, states Pekka Heino, the mentor of the project.

The active interaction between the various actors during the projects facilitates and supports learning and the sharing of expertise. In the students' case the expertise might mean fresh business knowledge about marketing or sales. As for the entrepreneur, students create value to the company by sharing their ideas and innovative approaches to different aspects of the businesses. When thinking "out of the box" – or "no box" students give an entrepreneur an opportunity to smarten the ideas and boost the decision making. Also the lecturer-coaches both share their expertise and develop it further by participating in the innovative knowledge-creation processes.

In the future, both the game development project and the pedagogical development will continue. In addition, research data will be collected and analyzed in order to form a justified empirical basis for the pedagogical development.

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