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Using Digital Gamification in the Context of Business Models

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Abstract

The use of blended learning and gamification to enhance motivation and learning by the students is a recent and increasingly important topic in teaching. This paper will give an example of how gamification was implemented in an entrepreneurial course using business models as the primary structure.

Introduction

Universities and higher educations have a strong focus on teaching entrepreneurship (Sexton & Upton, 1987; Fiet, 2001; Hindle, 2007) and as this special issue is emphasizing business models (BM) is likewise becoming an increasingly taught topic. Furthermore, the two topics are often parts of the same courses. Discussions have occurred in the educational context whether or not teaching should focus more on e-learning and the use of digital media mixed with traditional learning also called blended learning (Garrison & Kanuka, 2004; Conole 2008). The reasons for introducing blended learning is, for instance, to elevate student motivation based on the interactive capabilities of internet communication technology (Swan, 2001) and to promote critical thinking and higher-order learning (Garrison & Kanuka, 2004). This paper will give insights on how digital gamification was introduced and effects the feedback between students by a peer-feedback approach where students place 'money' on each other's business model ideas.

The approach has been applied to the 3rd semester elective 30 ECTS course on master's level called New Venture Creation (NVC), where the students work with applied entrepreneurship and develop a scalable business model throughout the course. The course, in general, follows the Lean start-up approach inspired by Ries (2011); Blank and Dorf (2012) and Blank et al. (2014) and has a strong focus on business models as the structure of the business development.

One of the issues experienced in the course was how to make the students more interactive and involved in each other's projects. The issue regarding interaction, in this case, can be seen as a twofold problem with an underlying correlation. The first part is related to the students mainly working on their own new venture project, and even though the groups are split into clusters giving presentations within the clusters, they lack the motivation to keep track of what the other groups are working on. The second part, related to the first part, is the students lack of engagement in each other projects inhibiting knowledge transfer between the students. The strength of knowledge transfer has been shown in other studies (Fiet, 2001; Siegel and Wright, 2015) where knowledge transfer is key in promoting idea development and broadening the student's competencies. The lack of knowledge transfer, in this case, would be related to sharing insights, cross-venture-development and constructive feedback between groups and furthering ideas and critical thinking within the groups.

The issue of lacking interaction and knowledge transfer was sought mitigated by the introduction of an online gamification tool. Gamification has proven to foster more interaction in classrooms and among students (Iosup and Epema, 2014). Hence the introduction of gamification through should give students incentives to interact, provide peer feedback and knowledge share more with each other. Peer assessment or feedback is a process where students evaluate achievements of their peers (Topping *et al.*, 2000). The feedback becomes a strategic learning process, where the students learn formative assessment as well as a tool for reflection (Cheng and Warren, 1999; Venables and Summit, 2003) Especially, the function of feedback and peer feedback have shown the ability to improve students' projects (Li *et al.*, 2010).

This paper will explain how the introduction of gamification and blended learning was introduced to NVC via an online gamification tool which would enable the ambition of more interaction between groups. The gamification was introduced through the learning-platform PeaQs[1], which is a newly developed online platform that combines well-known elements from crowdfunding platforms like Kickstarter.com and a stock market mechanism that assigns real-time shares/currency to the new venture projects as they are developed and displayed on the platform.

Approach

This section will explain the context and design of the course before going more into depth with how the gamification was introduced and the effects on the feedback and knowledge sharing between the students.

Course design

The implementation of blended learning and gamification needs to be thought into the course curriculum, and considerations need to be made as to how it fits the general learning style and flow of the course. For

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[1] It should be noted that the author from AAU has no ownership or stake in the company behind PeaQs.

the NVC course that focuses on applied entrepreneurship and BM, it was essential to find a tool that could accommodate the learning points in the applied entrepreneurship such as communication, validation and scalability. Furthermore, the class flow and "language" in the class is inspired by the Lean startup approach (Blank et al., 2014); hence the tool should also accommodate this terminology.

The learning tool introduced on the NVC course is called PeaQs (https://peaqs.com/) and the webpage state it resembles "Kickstarter meets Shark Tank". The selection of this learning tool in form of a gamification platform was primarily based on the assumption that it was fitting with the course flow and learning objectives regarding applied entrepreneurship and focus on BM. Furthermore, the platform had elements that promote interaction between the students and across groups, which was part of the initial problem related to the course.

The platform is divided into 4 distinct phases, where the students need to upload various information pertaining their new venture creation. As default the 4 phases follow a chronological flow from "idea/concept" to "get to market". A phase is characterized by a starting and ending date, where students are required to enter specific information, defined by the teacher, into the system. Furthermore, when a phase starts the students can buy/sell stocks in all venture creation projects on the platform except their own. Before the platform can be used, the administrator (being the course administrator, lecturer or course coordinator) needs to review the different phases and align these with the class flow and learnings objectives of the course. This is done by assigning own headlines to the various phases and templates and by adjusting the time brackets for when the phases shall become accessible to the participating students.

Following the structure of the NVC course, the platform was split into four separate phases: Phase 1) called 'Concept', phase 2) 'Business case', phase 3) 'Product description', and phase 4) 'Get to market' (see Appendix 1 for elaboration). These phases correlate with the learning objectives and stages of the course. All phase-headlines and topics within each phase can be edited to make an optimal fit to course learning objectives. The following sub-section will introduce how the learning tool was introduced and how the gamification effected the process.

Appendix 1: Elaboration of each phase and the platfrom in the NVC course

The first stage of the course, the students would first identify a problem and an idea for a solution; they want to work with throughout the course. This corresponds to the 'concept phase' being the first phase in PeaQs, where the students have to describe the idea/concept and write their team profile.

Following this phase, the second phase 'business case' goes more into depth with the product-market fit, minimal viable product (MVP) and different customer segments. The NVC students at this point are working with MVP in the lectures and validating the various features and ideas surrounding the product/service and identifying the right value proposition on a general level. This shows the ambition of alignment between the information needed in the phase on the platform and the content the students are lectured during this stage of the course.

The third phase is 'product description' which relates to working with the value proposition and how to address and target the customer segments, thus generating revenue. The headlines here are focused on specifying the value proposition, towards specific customer segments and how to reach them. This relates to the themes the students are working on during this stage of the course, such as customer journey, how to get/keep/grow customers and how to generate revenue from their value proposition.

The fourth and final phase 'get to market' revolves around the partnerships and infrastructure the idea will need to succeed. This correlates with the students at this stage who are working on key activities, key resources, key partners and cost structure in BMC terms.

Gamification and Process

Before the students were invited to work on the PeaQs platform, an introduction was given to the students regarding the relevance of the learning tool and the ambition of introducing the tool. Following this explanation, the students all had to create a profile on the platform that allows for group business development on one side and individual investment with a game currency on the other. After the students have created their personal profile, they can form groups according to the groups they are working in. Every student in the group can now add text, pictures, films and graphs to describe and update their project when required according to the phases.

From here on the concept is fairly 'plug-and-play'. In each phase, the students are guided towards what

information they need to produce, insert and upload. The figure below illustrates what the page looks like when information has been uploaded in the concept phase. In this instance, the group is working with a project called "RAMP", and they have uploaded a picture with their logo and some ideas of features together with a description of the project. Furthermore, in the top right corner, it is possible to follow the stock price development for this specific project. If this screenshot was taken right at the introduction all stocks would be valued at 100; this screenshot is taken shortly after, where it is noticeable that the stock price has fluctuated somewhat due to other students buying/selling RAMP stocks.

Once the groups have updated and published their project/business case on the concept page, this is reflected on the asset/product page as well as the
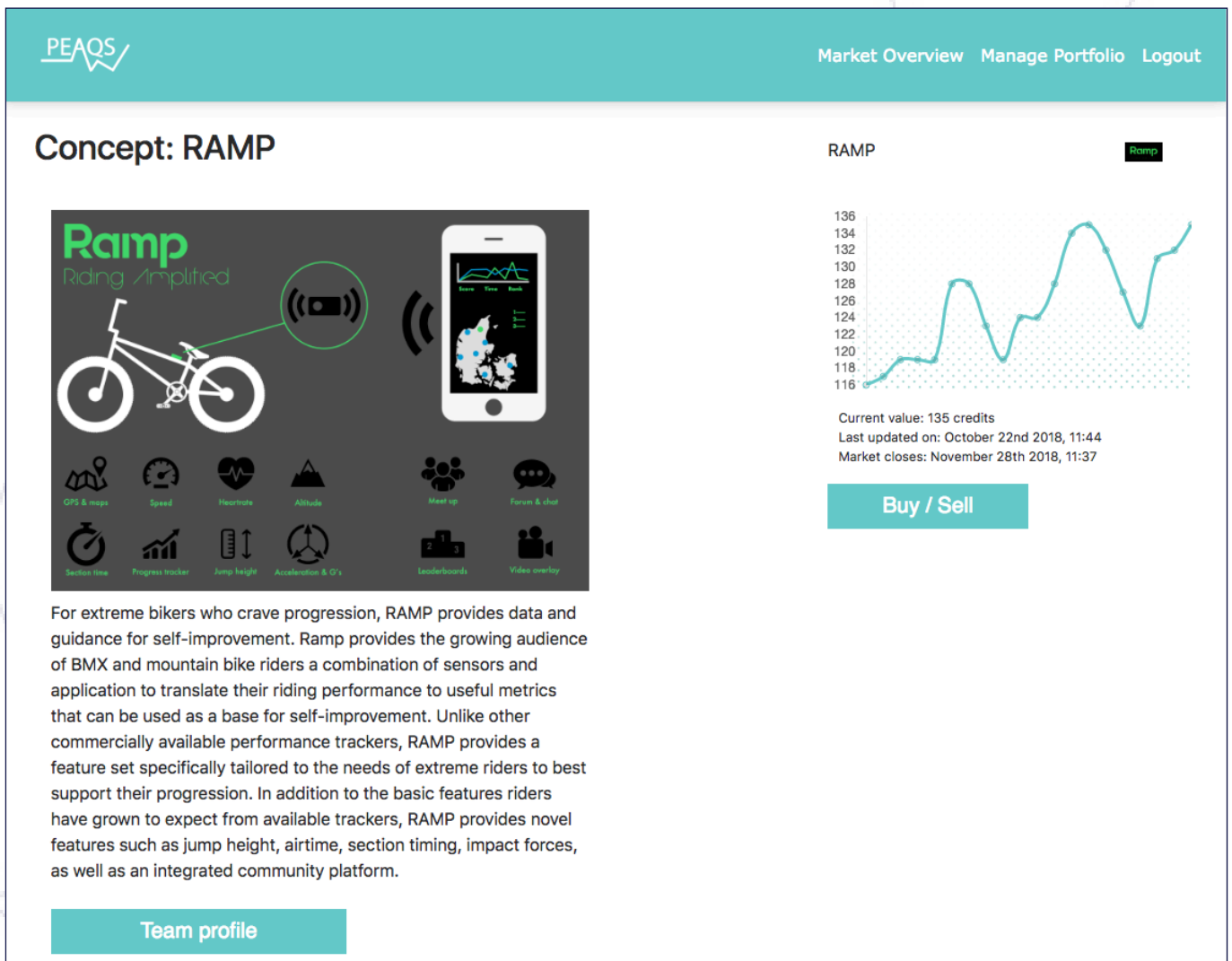

Figure 1: Screenshot from an individual project page with concept description and stock price.

common market page, which is the overview page (see figure 2). On the market page, all students can see all projects on the platform pertaining to their course. At this point each student can use his/her online currency to buy stocks in the projects they find most promising. As the investments are occurring the prices on each project/stock will start to rise/fall depending on the overall interest in the stock.

Figure 2 below illustrates the market page or "stock exchange". In the top part of the market page, the students can see the development in stock prices for each project and furthermore a top 10 ranking of the best performing projects as well as the top 10 investors Below this, the students can browse each project/business case to identify which project/case they find most promising and want to invest their currency into.

Gamification and peer feedback

As previously mentioned, one of the challenges in this course was to create more feedback and especially peer feedback. From the initial development of the course
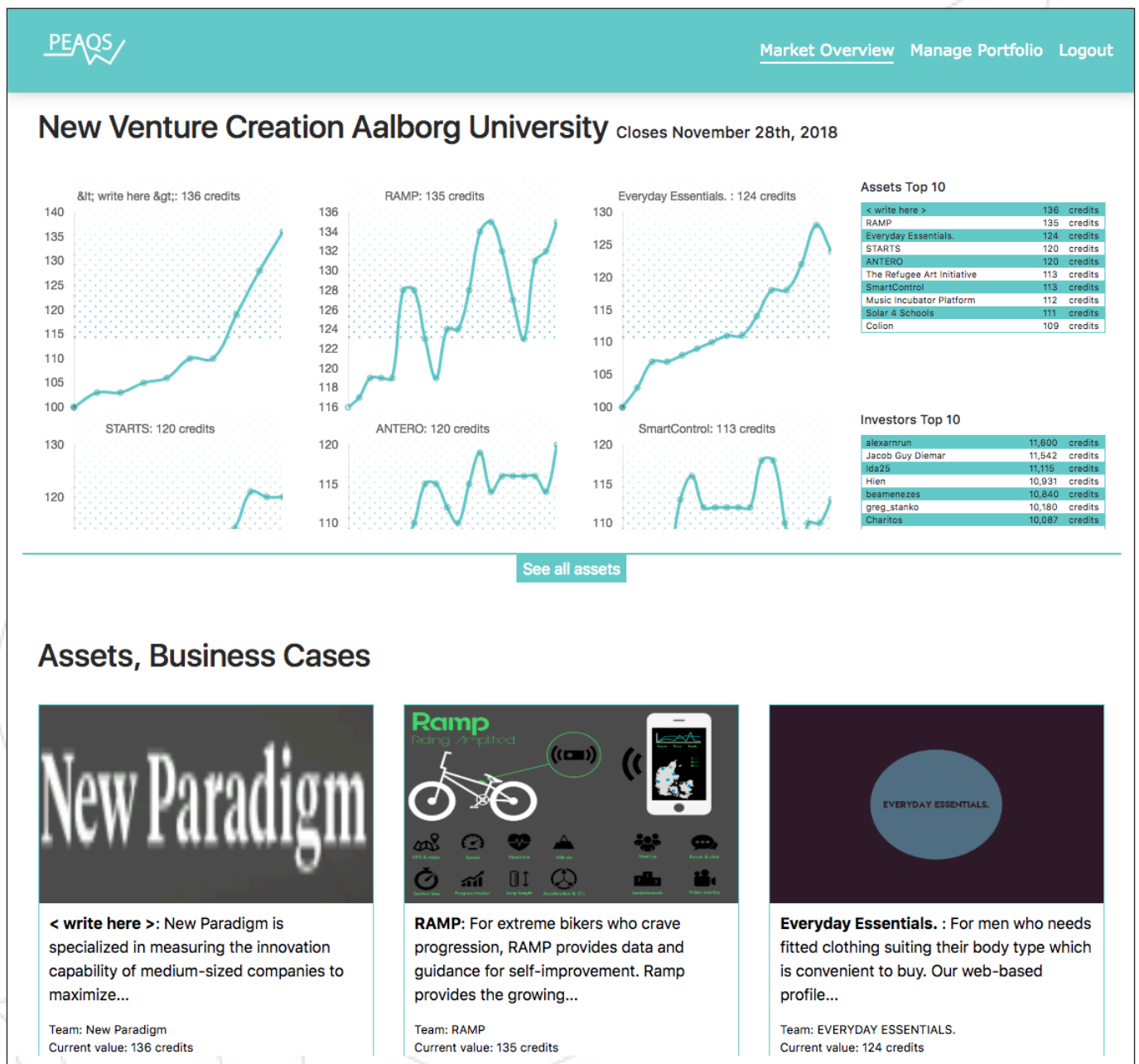

Figure 2: Screenshot from the "stock exchange" overview

weekly presentations were implemented as 10 minutes "what have you learned" presentations, where the supervisors can give feedback to the students. This session was also intended to act as way for the students to give peer feedback to each other; however, this rarely happened. This led to introducing the blended learning and gamification aspects into the engagement into the weekly "what have you learned" presentations and feedback.

This implementation of gamification through the "stock exchange" enabled the students to reflect on what the other groups had uploaded and further to help them reflect upon their own information upload. During the weekly "what have you learned" pitches, the peer feedback improved, as more fellow-students had read up on the other projects and hence were able to give more constructive feedback. Furthermore, the students would more often engage in discussion concerning their own investments and the other investments before and after the formal pitches, showing a higher degree of interest in each other projects than previously observed in the course.

In this manner, the students showed a higher degree of critical thinking, and a greater level of knowledge transfer than during regular presentations without the gamification mechanisms.

Furthermore, the supervisors would in plenum with all students discuss why some projects were performing better than others. This was done to increase both the knowledge sharing but also the quality of the peer feedback. E.g. the students quickly learned that it was important to be short and precise in their formulations and more importantly; be understandable as the better the "peer students" understood the project, the better the quality of feedback.

In the final week of lectures in the course the best project/case on the platform receives an award indicated for achieving the highest stock price, which also implicitly translates into the best peer review. This is done to motivate and provide incentives to the students to continuously update their projects and furthermore buy/vote on the projects they feel should be the "winner" for having the best business idea. This part is optional, and the whole leaderboard can be removed from the learning tool, if not suitable for the learning objectives of the course. This "award" is not part of the final grading of the students, but is done to motivate the students.

Key Insights

Introducing a blended learning platform, in this case PeaQs, was quite straightforward, and the students had virtually no issues with understanding and engaging in a digital learning and gamification platform. Furthermore, the students understood the relevance and found interest in the use of an online platform underpinning the strength of blended learning and gamification. This is in line with what research into blended learning suggests when describing the implementation of gamification as "promising" (Iosup and Epema, 2014).

It is also worth mentioning the quality of discussions among the students propelled by the question of what information they should prioritize and upload into the system. They engaged in discussions regarding how to condense their ideas into, e.g. 150 characters. In other words, the ability to convey a problem, present their solution and the associated value proposition in a short and precise manner. Furthermore, as students dived into the development of their projects/business cases of their peers, a loop of reflection and inspiration took place, inclining them to improve and refine their projects. This showed signs of a higher degree of knowledge transfer (Siegel and Wright, 2015), increase in the quality of the projects (Li *et al*. 2010) and is furthermore in line with research showing positive learning outcomes of blended learning (Garrison & Kanuka, 2004).

A potential negative side, which the coordinator/lecturer needs to be aware of, is the motivation provided by the gamification. If not appropriately introduced and followed-up during the process, students might go for the prize of winning the 'competition' rather than using the stock market mechanism to leverage a better and deeper understanding of the projects on the platform. A few of the students addressed this to the coordinator, as they were not sure how they should spend their currency on the platform. This triggered a

need for further explanation regarding how the students, in the context of the course, should evaluate and invest. The criteria for the new venture creation course being validation, potential and scalability. These criteria are some of the key elements of Lean start-up and the course learning objectives in general. In short, it is crucial that the students understand the learning objectives within a blended learning and gamification framework, or else the gamification incentive can end up disrupting the learning outcomes.

The notion of implementing gamification with a virtual currency also showed an interesting effect among the students, as they were very keen on learning how they could grow their portfolios and optimize their investing approach. The teacher could potentially choose any "currency" or other types of stimuli to engage the students. The choice of "money" as a currency here, was in line with the entrepreneurial theme of the course and a setting familiar to most students. In addition, the platform and choice of currency demonstrated the motivating impact of gamification in classrooms (Iosup and Epema, 2014). However as written above, should be aligned with the learning goals and objectives of a specific course.

The 'stickiness'-factor of the stock market mechanics keeps students engaged in the platform's gamification but also emphasized the need for countermeasures to avoid a day trading scenario. The students could become too engaged with the pure performance part optimizing their portfolio and hence not consider the feedback needed for the weekly sessions. Such behavior of not truly using critical thinking to give quality peer feedback can lower or disrupt the benefits of peer feedback (Li *et al*. 2010). Addressing the concern of students adopting a day trading[2] approach, a cap to trading was introduced into the trading algorithm. This cap dictates that a student can only make one transaction (either buy or sell) per stock for every game phase. This initiative sharply reduced any speculative mindset but still left plenty of incentive to scrutinize other projects/cases on the platform (and hence enable peer feedback) and also invest wisely.

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[2] Day trading is determined by frequent buying and selling of a single or a limited number of stocks only to optimize an investment portfolio.

The direct effect the blended learning and gamification had on the projects and presentations are difficult to measure, and the supervisors stated, that it might have had an impact, but it was hard to pinpoint if it was the platform or other factors that made the students more engaged. However, and more importantly so, no students uttered any discouragement or feelings of demotivation in using the platform. As stated previously the introduction of the gamification which enable more and better peer feedback, which was observed during the course. Albeit not being able to provide any direct cause and effect in this paper; the higher degree and quality of peer feedback should have a positive impact on the students and projects in accordance with previous research (see e.g. Venables and Summit, 2003; Li *et al*. 2010).

It should be noted that the peer feedback in this paper was not directly a part of the final grading. This could potentially be incorporated that the students had to do peer feedback orally or written and would be part of the grading. In the current context, the University only allow us to expect involvement and interaction during the course and a student can be expelled from the program for having an attendance lower than 75%. But this measure is not affecting the grading. However, the feedback from the supervisors and censors at the exam indicate that the students, which have been involved in the peer feedback during the course are more knowledgeable and in line with the learning goals often leading to better grades.

Discussion and Conclusion

The problem discussed in this paper is the lack of interaction and knowledge sharing often seen in the context of entrepreneurship and business model teaching. This paper illustrates how some of these hurdles can be mitigated by introducing a blended learning digital platform that has a stock exchange mechanism to serve as a means of gamifying peer feedback and project evaluation. The ambition was to achieve more interactions and enhance knowledge sharing among students, improving their project quality and ultimately elevating their understanding of the subject matter – all in line with the learning objectives of the course. This is important to note as the introduction of a new tool/approach otherwise can become a somewhat fragmented experience (Fiet, 2014).

The problem regarding the interaction and peer feedback between groups was improved using the platform, and the students found the concept of the platform and within this, the investing aspect to be a motivating factor – which is a positive element to any all teaching approach. Furthermore, the interaction and peer feedback increased knowledge sharing among the students, which lead to further input and idea development and enhance critical thinking towards project improvement in line with previous research (Venables and Summit, 2003; Li *et al*. 2010). All supervisors saw a gamification platform such as the one described above as a good opportunity to stimulate peer feedback and knowledge sharing among groups and to help motivate the students.

The experience also showed the importance of explaining the students why a new learning tool should be implemented in the course and how to go about using it. It might be intuitive for students and supervisors alike to use, but they will need to be informed on how to use it in relation to the learning objectives of the course at hand. This paper showcases an example where the students need instructions regarding how they should invest and what parameters they should apply to their investment decisions. Otherwise a "free market" approach might lead to suboptimal solutions and speculative day-trading behavior. As stated earlier, this was avoided by introducing a set of evaluation criteria based on the learning objectives, a technical update to the platform introducing a day trading cap and finally the feedback from supervisors.

In conclusion, introducing gamification, peer feedback through a blended learning approach has proven itself to be a positive contribution when teaching BM and entrepreneurship. The online gamification platform improved the interaction, peer feedback and knowledge sharing among students and also furthered the motivation to improve their projects/cases and to apply critical thinking to their learning process. The approach also strengthened the student's skills and capabilities in regards to the learning objectives of the course that stress communication and critical thinking.

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