

Tadawl: An Educational Platform for Gamifying Startup Investment

Hend S. Al-Khalifa¹ and Rawan Al-Matham

Information Technology Department

College of Computer and Information Sciences, King Saud University

Riyadh, Saudi Arabia

¹hendk@ksu.edu.sa

ABSTRACT

Gamification, or the use of game mechanics in non-game applications, allows students to learn by doing. In this paper we present our experience in implementing a gamification platform in our entrepreneurship course to encourage students on investing in their peers' projects and provide them with feedback. The platform involved the interaction of 106 undergraduate female students during a semester long entrepreneurship course. We also report the results obtained after using the platform in terms of students' feedback and final remarks.

CCS CONCEPTS

- Social and professional topics~Professional topics~Computing and business~Economic impact

KEYWORDS

Entrepreneurship Education; Gamification; Startup; Student Engagement; Student Feedback; Stock Market

ACM Reference format:

Hend S. Al-Khalifa and Rawan Al-Matham. 2021. Tadawl: An Educational Platform for Gamifying Startup Investment. In *Proceedings of the 22nd Annual Conference on Information Technology Education USB Stick (SIGITE '21)* October 6–9, 2021, Snowbird, UT, USA. ACM, New York, NY, USA, 4 pages. <https://doi.org/10.1145/3450329.3476850>

1 Introduction

Entrepreneurship education depends on several teaching methods such as traditional lectures and practice such as business plans, case studies, simulations, etc. The goal of entrepreneurship education is to develop an entrepreneurial mindset, which consists of a set of attitudes, skills, and behaviors to discover entrepreneurship opportunities and create value within

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.

SIGITE '21, October 6–9, 2021, SnowBird, UT, USA

© 2021 Association for Computing Machinery.

ACM ISBN 978-1-4503-8355-4/21/10..\$15.00

<https://doi.org/10.1145/3450329.3476850>

uncertainty. Entrepreneurship requires strategic skills, such as building new products and services, marketing, finance as well as self-efficacy.

Gamification is an effective method to drive students' participation and engagement in a course since it taps into human desire and its natural attraction for gaming. The gamification concept and its operationalization in non-gaming contexts has become a growing practice in several contexts. It has been used in different settings of entrepreneurship education, for instance Isabelle [1] used a stand-alone gamification platform integrated with Shopify, a global e-commerce platform for online stores, to engage 269 undergraduate students during a trimester-long undergraduate entrepreneurship course. Wangi et al. [2] used gamification strategies such as leaderboard, points and medals on the entrepreneurship course in Indonesian Language and Literature study program. Similarly, Bellotti et al. [3] employed gamification for the promotion of entrepreneurship on a gamified short course targeting Electronic Engineering students. The short course relied on an extensive use of gamification components and featured a team competition, rewarding students' gaming and reporting activities, assigning a cumulative score to define the team ranking for the final day playoff matches.

Given these examples of using gamification in entrepreneurship education, Bagheri et al. [4] in their systematic literature review examined papers on the intersection between gamification and entrepreneurship education and found that there is limited literature on the interrelationship between gamification and students' entrepreneurship learning outcomes. To overcome such limitation, in this paper, we present an entrepreneurship educational platform called Tadawl (<http://tawdeal.herokuapp.com/>) that is based on the concept of stock markets and explore how students develop an investors mindset in an entrepreneurially-focused marketplace. The platform was developed for the (Entrepreneurship and Innovation in Information Technology) course to create feedback, particularly peer feedback in students' startup projects and educate them on investment.

The rest of the paper is structured as follows: section 2 describes the organization and the topics taught in the Entrepreneurship and Innovation course. Section 3 presents an overview of Tadawl platform. Section 4 describes the methodology and the measures utilized. Section 5 presents the results collected. Section 6 presents students' feedback. Finally, Section 7 concludes the paper with future directions.

2 Course Overview

2.1 Course Organization

The Entrepreneurship and Innovation course is a 3-credit hour course and is currently being taught as a core course at the Information Technology Department, College of Computer and Information Sciences, King Saud University, Riyadh, Saudi Arabia.

The course was first offered in spring of 2020, for 14-Weeks semester, where students meet once a week for 3 lecture hours.

The course focuses on teaching the basics of Innovation and Entrepreneurship in Information Technology, market analysis and customer engagement as well as open innovation. It tackles the creation of startups and managing their growth.

2.2 Course Topics

A wide range of topics applicable to Entrepreneurship in Information Technology were covered as separate modules during the course. The covered modules are:

- Ideation and Design Thinking
- Market Research
- Lean Startups
- MVPs & Prototyping
- Business Model Canvas, Lean Canvas and Mobile Business model
- Digital Marketing
- Startup Finance and Fundraising
- Legal Aspects and Cause of Death & Closing
- Presentation Skills and Pitching

3 Tadawl Platform

Tadawl is an interactive platform for showcasing entrepreneurship projects and investing in them, it utilizes gamification mechanisms to grant students the ability to practice entrepreneurship fundamentals and innovation in a practical manner. The gamification mechanisms in Tadawl include: Stock market, Project Groups leader-board and Investors leader-board (see Figure 1).

The platform also consists of several phases, starting with forming students into groups and working on an entrepreneurial idea as a startup, then placing it for trading in a virtual stock market, where students act as individual investors who sell and buy stocks, and manage their project portfolios. The platform provides the following features:

1. Create Virtual Stock Market

The instructor has the ability to create a virtual market and invite students as participants in it. The virtual stock market has been reignited in somewhat compared to a normal stock market, so it doesn't encourage speculation in the mere dynamics of a stock market. The student can only invest once and divest once per project per phase.

2. Group Formation

The instructor has the ability to form groups of students. Entrepreneur roles are mainly performed in groups as a collaborative process.

3. Invest in Projects

The students are able to act as individual investors who sell and buy shares of other students' projects. Each investor starts out with 10,000 credits to trade with and each project starts with a basic valuation of 100 credits.

All sessions of Tadawl are set to expire according to a pre-determined timing set by the instructor, and at the end of a session all participants will receive a ranking of best projects on the Marketplace and best investor performance.

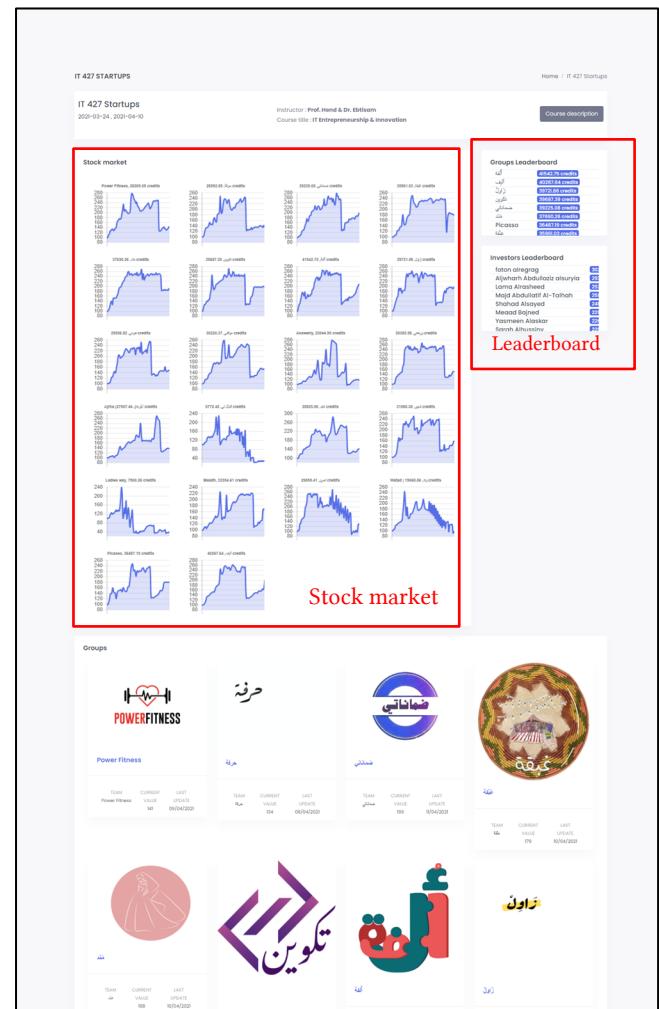


Figure 1: Tadawl marketplace main page showing the leaderboard, stock market and startups projects showcase

4 Method

Following the structure of our Entrepreneurship and Innovation course, we created a marketplace for the course project. The marketplace was split into four phases: 1) startup idea, 2) solution description, 3) Team profile, and 4) Go to market. These phases correlate with the learning objectives and stages of the main project course.

Before the students were invited to work on the Tadawl platform, an introductory video was given to them explaining how to use the platform. Also an announcement was posted on the course LMS regarding the relevance of the platform and the ambition of using it.

A post-questionnaire was conducted on 106 students after their platform experiment to acquire further feedback on the gamification approach. In addition, the post-questionnaire contained open-ended questions to obtain further information on students' reflection regarding their experience and perceptions in using the platform.

5 Results

To measure student satisfaction with Tadawl and its usability, we used a post-questionnaire via Google Forms. The questionnaire consists of two sections; the first section contains the System Usability Scale (SUS) [5]. It is a reliable tool for measuring systems' usability. It consists of 10 items with a 5-point Likert scale options ranging from Strongly agree to Strongly disagree.

The calculated SUS for Tadawl yielded a value of 60.3, which means that it is little below the average SUS score which is typically 68 [5]. The open ended questions regarding Tadawl usability shows that the reason behind the low score was because of the hosting server. The server locked the students access when all students entered the system at the same time. This issue was resolved by changing the hosting server.

The second section of the post-questionnaire contains eight questions which were adopted from AlBasheer and Almazrou [6]. This section assessed the effects of using the platform on students' perceptions of satisfaction and engagement.

We employed descriptive statistics with mean and standard deviations to measure students' satisfaction and engagement regarding Tadawl platform. Table 1 shows the results of the second section of the questionnaire.

As presented in Table 1, more than half of the students agreed that the use of Tadawl in this course encouraged them to participate (55.10% (Mean 32.67)). Also, most of them reported that the use of Tadawl helped make other groups' projects transparent (67.35% (Mean 32.67)). Additionally, most of them prefer using Tadawl to participate in the course rather than using other channels such as discussion boards (64.29% (Mean 32.67)). Also, half of the students thought that using Tadawl made the course better (48.89% (Mean 32.67)).

Table 1: Students' Responses Regarding Their Satisfaction with the Tadawl Platform

Survey Item	Strongly Disagree No. (%)	Disagree No. (%)	Neutral No. (%)	Agree No. (%)	Strongly Agree No. (%)	Mean (SD)
The use of TADAWL in this course encouraged me to participate.	4 (4.08%)	8 (8.16%)	32 (32.65%)	30 (30.6%)	24 (24.49%)	19.6 (11.48)
The use of TADAWL in this course encouraged others to participate.	2 (2.04%)	7 (7.14%)	34 (34.96%)	32 (32.65%)	23 (23.47%)	18.75 (12.97)
The use of TADAWL in this course was distracting.	13 (13.27%)	17 (17.35%)	34 (34.96%)	20 (20.41%)	14 (14.29)	19.6 (7.61)
Because of TADAWL, I participated more in this course than I normally do.	6 (6.12%)	23 (23.74%)	29 (29.59%)	24 (24.49%)	16 (16.33%)	20.5 (7.96)
I valued that TADAWL allowed students to respond anonymously.	5 (5.1%)	5 (5.1%)	40 (40.82%)	27 (27.55%)	21 (21.43%)	19.6 (13.41)
The use of TADAWL helped make other groups project transparent.	3 (3.06%)	0 (0%)	29 (29.59%)	31 (31.63%)	35 (35.71%)	15.75 (14.93)
I would rather use TADAWL to participate in the course than use other channels such as discussion board.	7 (7.14%)	7 (7.14%)	21 (21.43%)	37 (37.76%)	26 (26.53%)	19.6 (11.52)
Overall, I think having TADAWL made the course better.	9 (9.18%)	12 (12.24%)	29 (29.59%)	23 (23.47%)	25 (25.51%)	18.25 (7.74)

6 Students' Reflections

Students were also asked open-ended questions at the end of the post-questionnaire to elicit their overall impressions of their experience with Tadawl platform. Overall, students reported that they had positive impressions and experiences. Students indicated that Tadawl allowed them to participate in a fun and competitive environment. One student said that:

“I learn more about investments. It made me think that I can invest in the real world.”

Another student said that:

“I think it's a good way to explore all teams' ideas and learn how to invest, and also present our ideas in a good and professional way. Also It was helpful. It encouraged me to take risks.”

Similarly, another student commented about Tadawl as:

“Tadawl system has helped me to learn more about investment and when to buy or sell shares and based on what”.

In addition, Tadawl achieved its main objective of educating the students on playing the investor's role and grasping the investor's mindset in an entrepreneurially-focused marketplace. Students' comments such as: “*I might have an entrepreneurial mindset*”, and “*I learn how to market our project in order to make others interested in our project idea and invest in it by buying a share*” supported the objective of building Tadawl. Another said “*I learn to buy shares in early stage startups since it will be doubled in the future*”. As one student said “*it was that nice journey it gave me a picture of reality*”. Another student comment was “*It helped me know how to deal with stocks; buy and sell, and also helped me know how the investor can invest in the right project. It is risky but so fun*”. Another said, “*I was curious about investing in companies but I don't have the courage and the money to make it in real life so it has been an excellent experience for me and I will make it in real life*”. A similar interesting comment was “*The competitors are many and*

you should gain a special advantage". We noticed that most comments about learning outcomes focused on the experience of buying and selling and the behavior of the stock market.

On the other hand, once we asked the students about the motivation behind their investment in each phase, whether it is because of the stock market, Group leader-board or Investors leader-board, or All, a student said "*I liked the experience of entering the world of stocks*". Another one said, "*Frankly, investors leaderboard, because it encourages me to compete*". Another answer was: "*The most important factor that led me to invest in each phase is Group leader-board because it is an interesting and enjoyable platform*". Another student said: "*All of them encourage me, especially the investor and the group leader board because I want to see myself and my group in the first place*". This indicates that using gamification components like leader-boards was a strong motivation for students to participate and engage, as well as, the stock market view which gave them a flavor of entrepreneurship investment.

The results of this study showed that using Tadawl platform has a positive effect on the students' behavior and engagement in entrepreneurship course. It motivated them to enhance their projects, work more on their ideas and try to win the competition. Additionally, their feedback indicated that they are willing to use Tadawl platform again and help in improving it because it deserves to be used with the next semester students.

7 Conclusion and Future Work

In this paper, we presented Tadawl platform that represents a marketplace for showcasing students' startup ideas and investing in them. The paper has also reported our experience in adopting a gamification approach in which the students can develop their interests to learn about investment and provide feedback to their peers.

Given the successful experience of Tadawl platform, the next step is to scale the platform to handle larger number of users and integrate more interactive features such as digital wallet.

ACKNOWLEDGMENTS

The authors thank the Center for Excellence in Learning and Teaching, King Saud University Riyadh, Saudi Arabia for funding this project.

REFERENCES

- [1] D. A. Isabelle, "Gamification of Entrepreneurship Education," *Decis. Sci. J. Innov. Educ.*, vol. 18, no. 2, pp. 203–223, 2020, doi: <https://doi.org/10.1111/dsji.12203>.
- [2] W. Nisaul Barokati Seliro, K. Lur, M. S. Saifillah, and E. Yu, "Gamification Strategy in Entrepreneurship Course", Accessed: May 11, 2021. [Online]. Available: <https://core.ac.uk/reader/324202680>
- [3] F. Bellotti et al., "A Gamified Short Course for Promoting Entrepreneurship among ICT Engineering Students," in 2013 IEEE 13th International Conference on Advanced Learning Technologies, Jul. 2013, pp. 31–32. doi: 10.1109/ICALT.2013.14.
- [4] A. Bagheri, A. Alinezhad, and S. M. Sajadi, "Entrepreneurship Education and Gamification: An Analysis of Students' Learning Outcomes," in *The Entrepreneurial Behaviour: Unveiling the cognitive and emotional aspect of entrepreneurship*, A. Caputo and M. M. Pellegrini, Eds. Emerald Publishing Limited, 2020, pp. 25–39, doi: 10.1108/978-1-78973-507-920201005.
- [5] A. S. for P. Affairs, "System Usability Scale (SUS)," Sep. 06, 2013. <http://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html> (accessed May. 07, 2021).
- [6] A. Al Basheer and S. Almazrou, "Assessing Female Pharmacy Students' Satisfaction with Active Learning Techniques at King Saud University," *Adv. Med. Educ. Pract.*, vol. 12, pp. 319–327, Mar. 2021, doi: 10.2147/AMEP.S284415.