

HORTARI: A GAMIFICATION APPLICATION FOR ENGAGED TEACHING AND LEARNING IN HIGHER EDUCATION

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The primary purpose of this study is to create gamification application in both web and mobile to motivate and engage students in learning their lessons to a certain subject. The incorporation of gamification into classroom activities has shown positive results in terms of student's performance and productivity.

Incorporating lessons, creating syllabus, and integrating table of Specification are among the fundamental features of the application that made it distinctive to the other existing gamification application. Integrating Table of specification in the application helps the students to recognize main ideas, key skills, and the relationships among concepts more easily. Creating a detailed course syllabus showed connection between course goals and course requirements and have been found to be most effective in achieving positive student outcomes.

The results of the test survey and evaluation form were analyzed and proved

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the effectiveness of usability and functionality of the application.

1 Introduction

Education has both social and cognitive roles. As a social role of Education, it provides a foundation to overcome human condition, poverty, vulnerability, inequality, and exclusion and offers solution in creating opportunities for a culture everyday life suitable with nature and so as in accordance with advancements human beings have achieved. In its cognitive role, education is one of the ingredients in making a social individual with enhanced mental, moral, and many other capabilities. These capabilities help a person acquire, use, and transfer knowledge and skills. Education can produce a generation of individuals who are better prepared for any career and can make greater contributions to society (Cagadas, 2013). It implies a discipline and development by means of study and learning.

However, there are some sort of critical issues in education today and these issues are important to education. One of these issues is student learning. According to Dewitt (2014), learning is one of the important matters in achieving student's success. Often teachers and educators focus on teaching but it is the learning that matters most. Human beings are unique among all living organisms in their primary adaptive specialization lies in identification with the process of learning.

Nowadays, students are no longer motivated to reach its highest potential particularly in educating oneself. Based on a review research from various sources, it was found that while existing efforts to increase student achievement are an important part of education reform, they have not focused enough on what it takes to motivate students in schools (Crotty, 2013). This is supported by ACS Distance Education (2011) stating that learning requires motivation. Educators and learners are the very important in the learning process. Thus, both must need to develop strategies to motivate each other during learning process, and its outcomes. Jan Plass (2013) claimed that games have the ability to visualize things of creating open-ended environments for people to explore things of engaging and motivating learners. In other words, game motivates learners. They are essential in delivering learning and to use data to help players understand how they are doing, what they need to work on and where to go next. Games are activities in which participants take part for enjoyment, competition, and learning (Lahri, 2015). Amy Paturel (2011) stated that people who played games especially in computer-games made decisions 25% faster than others without sacrificing accuracy. Research done at Germany's University of Regensburg (May *et al.*, 2008) clearly shows that learning produces a demonstrable increase in brain's gray matter in mere weeks

and brain scientists over the world agree that game's challenge-achievement-reward loop promotes the production of dopamine in the brain, reinforcing our desire to play. Study shows that playing games is a form of active learning and enhances visual and mental capabilities that provide students with opportunities to develop their skills, act freely, show competency, and work together (Hotz, 2012).

Nowadays we are surrounded by a wide range of concepts related to games that can be used with learning purposes and one of them is gamification. Gamification is the application of game-like mechanics to non-game entities to encourage a specific behavior. It promotes competition and helps students track their own progress. A popular example of gamification is Deloitte's Leadership Academy, which uses rank, rewards, missions and leader boards as one of the ways to encourage its employees and client companies to log on, take courses and continue corporate training despite busy work schedules. Like most attempt to improve the system of learning, gamification has setbacks which is considerably significant. Despite of the motivation and encouragement that a gamification could give to its users, poor design of the game leads to disengagement and confusion (Bellotti *et al.*, 2009). Moreover, Bellotti stated that some of the existing applications of gamification also do not meet the learning needs of all students. In addition, Adam Hollander (2014) proclaimed that the reason most gamification failed is because of lack of planning and strategy to the system. Ledda (2014) revealed that some of the reasons why existing applications in gamification failed is because the developer don't analyze the real needs of the users, what the learners do not know, what do the developers want the learners to do at the end of the course, and why use gamification for the goal of their company. In connection to the statement of Ledda, in creating a gamification, one must have to be able to visualize what type of gamer will be playing. One should also design the activities according to the knowledge they have about that topic and according to the learning outcomes.

Based on the existing studies, there is a gap between the educators and learners on how to provide good learning environment. The learning that a student will get out of the existing application in gamification is not inline to the lessons they encountered in a certain subject. Moreover, the content of the existing applications in gamification are not linked to the learning they must absorb. The static content of the gamification may lead the students to unengaged and not motivated anymore to it. Students cannot recognize main ideas, key skills, and relationships among concepts easily.

The need to be able to distinguish the right content of the game in the Gamification greatly helps students in successfully driving their motivation and engagement in learning their lessons to a certain subject. The researchers

created a tool that focuses on the necessary learnings that students must absorb.

2 Methodology

Figure 1 shows how to apply the table of specification in the application. The teacher needs to indicate the subject and the class name in creating a class. After which, the teacher have to upload the course syllabus first then create his Table of Specification (TOS). After creating the TOS, the teacher needs to upload his lessons before he can activate his class. The teacher has the privilege to monitor and manage his class, he can also upload the assessments he made and can view the students' grades. At the end of the semester, the teacher must deactivate his class.

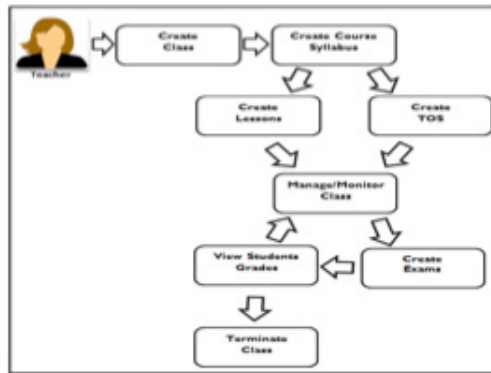


Fig. 1 - Flow Diagram in integrating TOS

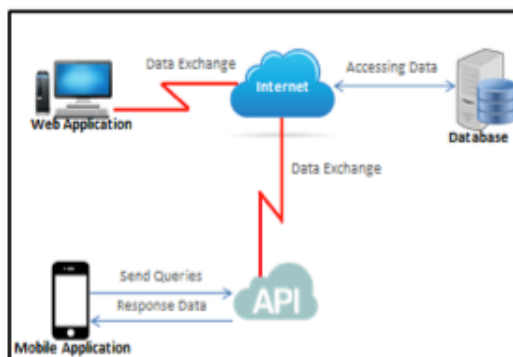


Fig. 2 - System Architecture of Hortari App

Figure 2 shows the representation that defines the structure and behavior of

the system. There are 3 users in the application, the school admin, the teacher and the student. It is where the school admin can Create, Read, Update and Delete in the system. The school admin also has the authority to add and register a teacher. While the teacher can create and manage his class, he can also view his class status. By the use of API, the student can join class and can view class update. Accessing the internet allows the users to access the data from the database. The user can also input data to the database.

3 Findings

Table 1 shows the result of the test survey and evaluation form in evaluating the usability of application evaluated by students. Thirty (30) students evaluated the application. As shown in the table, 67% of the respondents strongly agree that they are satisfied with the app. 50% strongly agree that the interface of the application was pleasant. 47% found the application very engaging specially the game. 43% of the respondents felt very confident in using the app. 60% strongly agree that most people would learn to use the application very quickly. 53% agree that the various functions in this mobile app were well integrated.

Table 1
USABILITY EVALUATION RESULT IN HORTARI APPLICATION

Criteria	n	Strongly Disagree	Disagree	Fair	Agree	Strongly Agree	Total
1. I think that I would like to use this application frequently.	30	13%	23%	7%	40%	17%	100%
2. I found the application unnecessarily complex.	30	7%	3%	70%	17%	3%	100%
3. I thought the mobile app was easy to use.	30	13%	7%	13%	20%	47%	100%
4. I think that I would need assistance to be able to use this app	30	50%	20%	23%	7%	0%	100%
5. I found the various functions in this app were well integrated.	30	0%	7%	13%	53%	27%	100%
6. I thought there was too much inconsistency in this app.	30	70%	0%	17%	13%	0%	100%
7. I would imagine that most people would learn to use this app very quickly.	30	0%	0%	10%	30%	60%	100%
8. I found this app very cumbersome to use.	30	60%	0%	33%	7%	0%	100%
9. I felt very confident using the app.	30	0%	0%	17%	40%	43%	100%
10. I needed to learn a lot of things before I could get going with this app.	30	30%	0%	53%	13%	3%	100%

Table 2 shows the result of the test survey and evaluation form in evaluating the functionality of application evaluated by three (3) experts. 2 out of 3 experts agree that the game respond according to its instructions. Majority of the experts also agree that the buttons and other major transactions in the system respond according to their functions like taking lessons and viewing announcements and leaderboards.

Table 2
FUNCTIONALITY EVALUATION RESULT IN HORTARI APPLICATION

Criteria	Remarks
1. Do clickable items stylistically indicate that they are clickable?	Yes
2. Do the buttons respond according to their functions?	Yes
3. Does the user can log proper username and password based on their accounts?	Yes
4. Is it readable? Consider type face, font size, color contrast.	No
5. Does the page load quickly for mobile users?	Yes
6. Does the user able to take lesson successfully?	Yes
7. Does the user able to view announcements?	Yes
8. Does the user able to view leaderboards?	Yes
9. Does the game respond according to its instructions?	Yes
10. Is the application free from errors?	No

Conclusion

The Hortari Gamification Application has undergone tests to know whether the problems of existing gamification applications have been resolved and the objectives of the study have been met and gather information on the outlook of the user about the usability and functionality of the proposed application.

Based on the result, majority of the respondents strongly agree that they are satisfied and become productive in using the application. On the other side, 3 experts evaluated the application’s functionality. Sixty-six percent of them said that they were able to take lessons, view leaderboards and announcements, and play game.

After revealing the result, the application clearly shows that it answers to the objectives of the student. By integrating table of specification in the system, it is proven that the knowledge and learning of the students are directly linked to the learning that the subject must provide to the students.

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