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Gamification Experiment in Introduction to ICT Development Course Through Art and Design



Abstract

Introduction to Information and Communication Technology Development course is one of general courses for 1st year Faculty of Visual Art and Design students in Institut Teknologi Bandung, Indonesia. The aim of the course is to develop understandings among students of Institut Teknologi Bandung for their future professional reference and benchmarking. Although the course has basic educational presentation and materials, the lecturers are facing difficulties to elaborate the content in order to get the students' attention and participation in the class meetings. The author conducted gamification experiments for 3 consecutive academic years since 2014 through elaborating and combining gamification mechanics Art and Design activities. This paper depicts 3 gamification experiments which may become future reference for game studies or media studies, especially gamification activities in high educational institutions. The result showed that game mechanics in gamification are good in creating interaction and playful experiences. However, in order to get the participants' active engagement, especially participants with visual art and design discipline, it requires more than just applying gamification's game mechanics. The game administrators must provide enough room for participants to communicate freely, to create and actively innovate the game through compact background story, design templates and guidelines.

Keywords: gamification, game studies, media studies

1 Introduction

Introduction to Information and Communication Technology (ICT) Development Course is one of general course for first year students who study in Institut Teknologi Bandung, Indonesia since 2008. Institut Teknologi Bandung established in 1920 initially as Technische Hogesschool, one the oldest engineering high educations in Indonesia, and became Institut Teknologi Bandung in 1959 [1]. The purpose of Introduction to ICT Development course for Visual Art and Design Faculty

students is to give basic understanding on recent ICT development especially in socio-cultural and professional point of views. The subjects of the course are basic of ICT explanation, computer's application tools, networks, and problem solving practices, and implication of how ICT affects human lives, world, and interaction. All of them are based on Beekman's Tomorrow's Technology and You which published by Pearson Education as the main sourcebook [2].

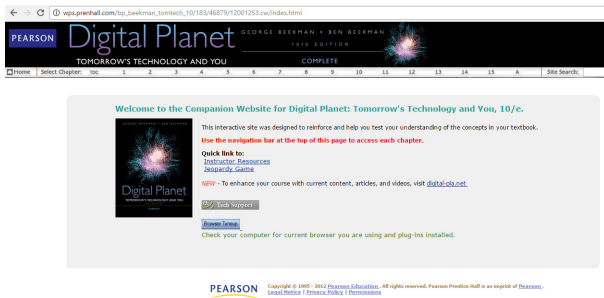


Figure 1: Beekman's Tomorrow's Technology and You 10th edition [3]

The book is supplied by continuously updated website and compact discs supplement consisted of digital content and basic presentation tools in Microsoft PowerPoint. Although the course content is constantly updated through the website, there is a problem that the lecturers in Faculty of Visual Art and Design ITB have to solve, which are updating audio visual teaching materials and socio-cultural and digital interaction in worldwide web as context materials. The first problem occurred when lecturers evaluated the teaching performance qualitatively and found significant depreciation of students' interest since 2010 and it is getting worse every year. The lecturers must update their audio visual teaching material databases at least every two years, but based on personal expertise and depth of understanding, it makes the audio video materials cannot be exchanged among them. The second problem occurred when updating the audio visual supporting materials is proven to be a matter of merely "cosmetics" communication. However in the other hand, updating socio-cultural and art & design conflicts happened in social media and worldwide web is the essence of taunting students' interests and understanding towards ICT Development and socio-cultural impacts.

2 Gamification Experiment

In the beginning of second semester in academic year 2013/2014, the author with the help of several post graduate students as assistant, set an experiment in order to create new

concept of delivering Introduction to ICT Development course through gamification. Gamification is applied game components and elements to create meaningful and playful achievement as well as experiences in social and or organizational interaction. According to Deterding et. Al. [4], gamification is using game design elements in non-game contexts. We developed a gamification simply by applying 7 game mechanics according to Bressington [5], which are Badges, Levels, Leaderboards, Progressbar, Virtual Currency, Awards, and Challenges among participant. The experiment was continuously elaborated for 3 consecutive years until academic year 2015/2016.

Techno-Gaia (2014)

The first gamification experiment on Introduction to ICT Development course titled Techno-Gaia. The basic concept of Techno-Gaia is the world setting where the students play the role of novice who climb up to be the top of significant profession in the end of the course. Meanwhile, lecturers and assistants are positioned as guild masters who deliver contents and mandatory mission in next class meeting or submitted online. The students are divided into 3 major professions or jobtype based on their answers on the initial questionnaire on the beginning of the course, and each job type is assigned a different emblem. As the consequences, each given mission must be designed specifically based on available job types.

The gameplay of Techno-Gaia applies the common Role Playing Game system such as Ragnarok Online MMORPG of Final Fantasy Tactics where the player can choose certain role which may affect the next assignments, missions, or activities. Overall, there are 17 job types which are based on 3 major professions. There are Bounty jobtype who pursuits highest achievement in ICT knowledge and understanding, Novizio jobtype who emphasizes aesthetic and state of the art in ICT projects, and Trader jobtype who is heavily based their decision on potential economic value. The students' performance in finishing personal or group mission will affect their position on the total scoreboard. Every students can see their score in leaderboard which is posted in facebook group weekly. When the students move on to the advance jobs or



Figure 2: Techno-Gaia (2014) Gamification Visual Elements. Badge of Various Job Type (from left to right upper row: Bounty, Trader Tycoon, and Trader Kingpin. From left to right lower row: Novizio Maestro and Novizio Whitesmith), and Players Avatar (from left to right: Bounty, Novizio, and Trader) [6]



Figure 3: The Imitator War (2015) Gamification Visual Elements. Game Logo and Title (upper left), Country Representation (bottom left, from left to right: US, Italy, German, Japan, and UK), Achievement Badge signified with number of stars (private, Major, Captain, Lieutenant, and Colonel).

levelling up, their emblem will shift into a more detailed visual as their reward in form of screen printed scarfs as achievement badges (See figure 2).

Imitator War (2015)

In academic year 2014/2015, the author offers the participants to create their own gamification theme. They are making groups and presenting their proposal towards others. The winner is gamification concept voted by the most of participants through short message system (SMS) voting system. The winning group assists the author as game masters throughout the semester delivering course's content and missions. The concept of gamification in academic year 2014/2015 is a Rebel vs Empire in year 3058. The world setting is German (game masters) dominating the world as the winner of 3rd world war and there are 4 rebellious countries against them. The game participants are making groups which then enlist under one of four countries and they have to do the missions in order to protect their cities from German aggression which may affect their total hitpoints. Each country has significant characters which will affect their attitude and style in finishing the missions.

The participants must develop their clan's emblem as their signature. They have to crawl up from the lowest level of participant, which is private to colonel as the highest possible rank. In Imitator War, the participants are introduced to sabotage mission system and Clash of Clans. Sabotage mission is a task that is secretly given to a group by the game masters to do other's secret mission with better result. If they did better than assigned group, the saboteur group will get

double victory points in return. Clash of Clans is ICT quiz competition for groups. The name Clash of Clans is taken from the famous mobile game in 2016 [7]. The quiz system makes the member of the group collaborate to find answers and response the question as soon as possible. Those activities are supported by constantly updated leaderscore board, and eventually heat up the competition throughout the semester (see Figure 3).

Kala Isvara (2016)

Kala Isvara is the latest concept of gamification applied in academic year 2015/2016. The concept of Kala Isvara is similar with Techno-Gaia but has deeper root in local content and traditional atmosphere. The participants are people of Zeelata world divided into 5 countries origin with their own value, namely Virata the fire country with bravery with fire lizard emblem, Manesha the country of water with wisdom with sea dolphin emblem, Satyata country of earth with honesty with turtle emblem, Badhr country of wood with benevolence with horse emblem, Vasana country of steel with righteous with tiger emblem, and they must serve under Yaksha Technologia (the game masters) with elder dragon emblem. All the names are derived from sanskrit language while the elements are taken from five elements or five states of change from Chinese mythology [8]. Those 5 countries are underlings of Yaksha due to lack of high technology innovation and application. The story of the game is, the students are future generals of Yaksha who compete with each other to earn that position. At the end of the semester, their scores will determine whether they can claim their position or failed (see Figure 4).



Figure 4. Kala Isvara (2016) Gamification Visual Elements. One of Participant's Avatar (left), Kala Isvara logo and emblems of the countries in Kala Isvara (upper right: Yaksha Technologia, lower left to right: Virata, Manesha, Satyata, Badr, and Vasana) [9].

In Kala Isvara, the active participation of the students are more far-stretched than previous game. They have to make their own avatars, nicknames, its background stories, and print in a card as their presence item in every class meeting. They also need to make a group and design their clan's banner, and appreciate and vote presentation materials of the game masters through their facebook account. The interaction among participants such as Clash of Clans and sabotage missions as well as leaderboard system, various personal and clan's missions are still applied. At the end of their semester, the participants are required to develop a game which may become the basic gamification concept for the next gamification of ICT Development course in academic year

2016/2017.

Gamification Concept Review

Each gamification concept has their own uniqueness which engages different deep interactions. Techno-Gaia 2014 gamification concept gives the game masters full authority in delivering contents and options of choosing job type towards the participants based on their personal preferences, but the downside is, the game masters feel overwhelmed in every session because they have to develop various missions for every job type and calculating points. The real time scoring leaderboard system creates competition among participants. Achievement points depicted by additional markings on their

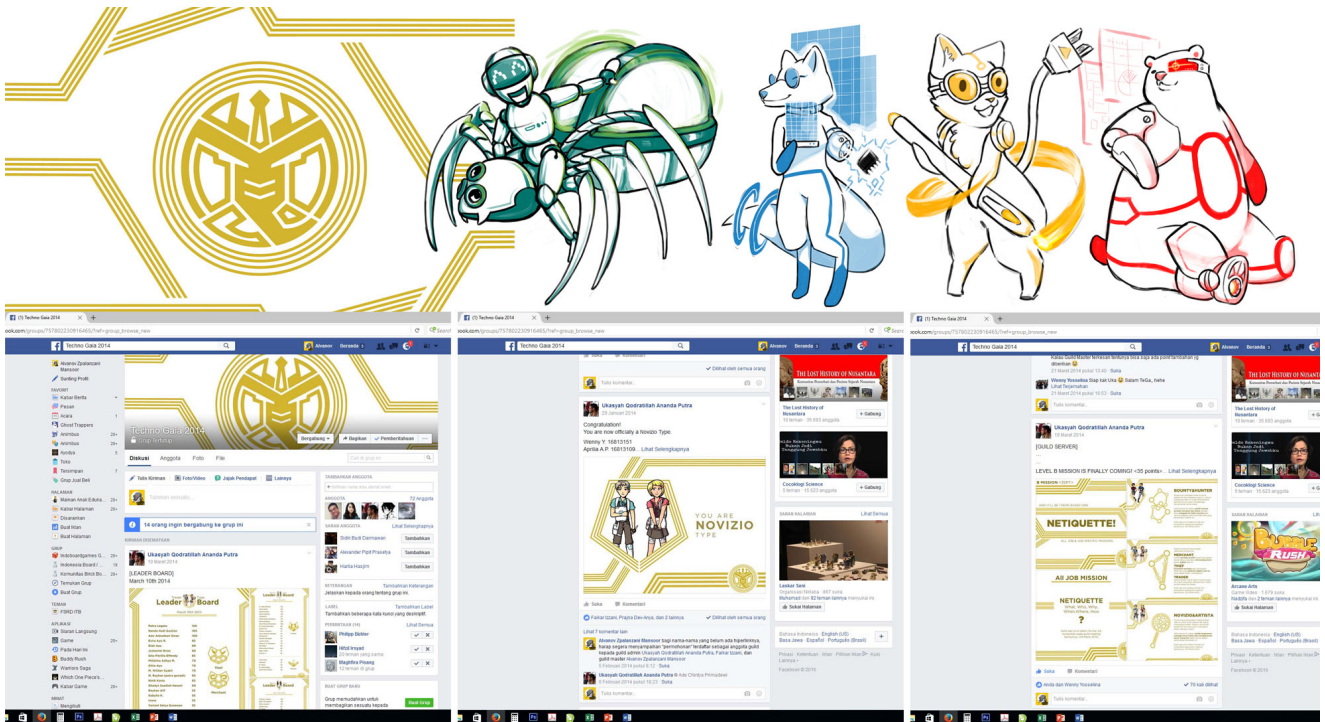


Figure 5. Techno-Gaia (2014) Game Master Logo and Avatar. From left to right (top images) Techno-Gaia Game Master logo and Game Master Avatars, (bottom images) facebook Group, Levelling Up announcement, and Mission announcement [10].

emblems also become their goals. The members of game masters are enthusiastic to develop game mechanics such as gamification logo, presentation templates, avatars and game master's uniform.

The participants are getting more perceptive at their expertise in the future, because the mission accomplishment is mainly in artwork form such as illustrated posters, comics, and audio visual materials, whether they make it themselves or modify it from several visual materials from internet with restricted precautions such as copy-pasting artworks required references.

Intense interaction among participants and game masters in class meeting happens when the talk is on socio-cultural interaction in digital world, such as manners in online corresponding with company representatives, social media usage, and broadcasting false information or hoaxes. The students are always fascinated with the showcase of technology advancements, but somehow neglecting the social impact. Meanwhile, in online interaction or facebook group interaction, the intense communication happens during launch mission. The game masters and participants can verify or clarify the mission or the output in order to do the job correctly. The above communication happens thanks to one secret mission that leaks to others and resulted mission cancellation in the end (see Figure 5).

One of special missions given to the participants is a mission to forecast the future technology and present in academic and illustrated posters. They have been given the audio-video materials that shows, recent technology are the result of "the dream of our forefathers." Therefore, despite of cherishing the recent technology, the students must forecast the form of future technology. They will be supervised by seniors invited by the game masters to help shaping up the ideas of the participants. The forecast mission results shows that the participants gains better insight and understandings on how they articulate ICT in their framework. Most of them can dig up certain technological knowledge which are still new in 2014 and embedded into their dream projects.

The 2nd gamification experiment or The Imitator War 2015 gamification concept is different from Techno-Gaia. The visual and game ideas are inspired by Command and Conquer: Red Alert 3, a Personal Computer game introduced in 2008 by Electronic Arts [11]. There is no job types variant but levelling up achievement instead. The sabotage mission and Clash of Clans or quiz competition activities are heating up the competition (distributing points through quiz session prior to mid semester test and end of semester final test). The facebook group communication system is not applied on this year because the game masters are constantly communicating with the participants. The missions are delivered through class meeting and done in form of artworks, illustrated posters, comics, and such. At the end of semester, the participants are rewarded an embroidered emblem which represent their latest position on the scoreboard.

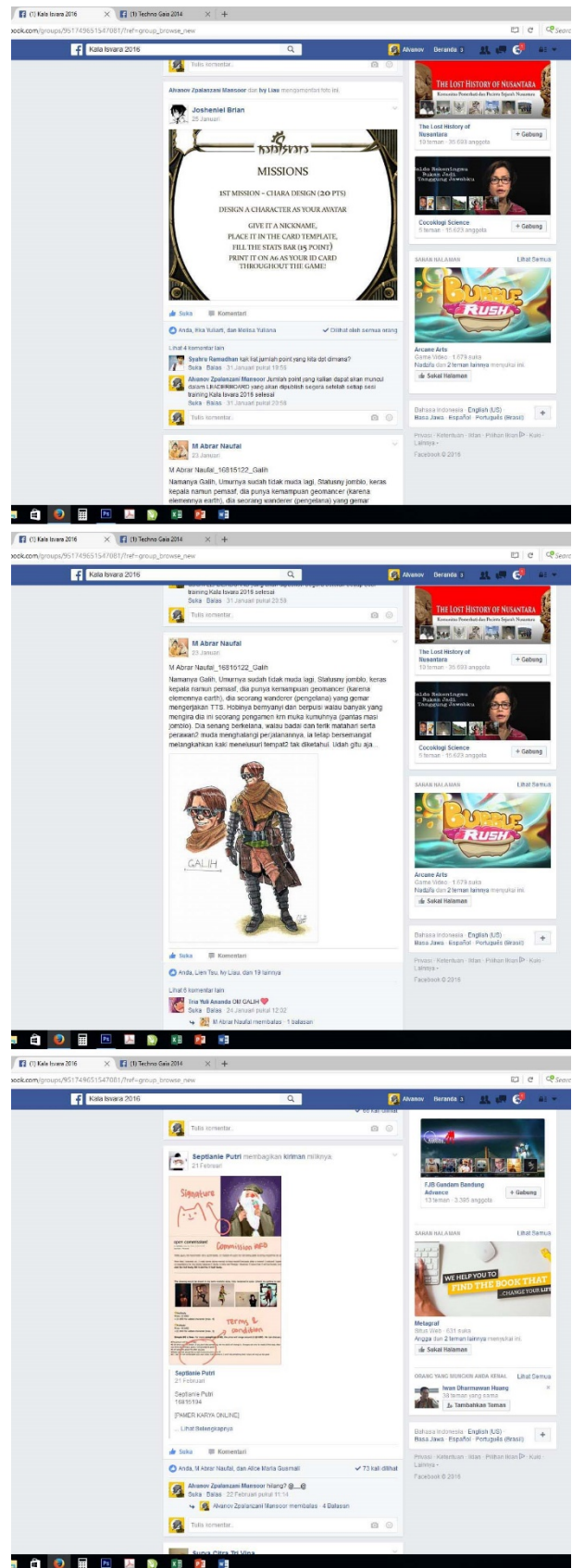


Figure 6. Participant's Avatar submission (top and middle figure) and Game Master's presentation reviewed by the participants [12].



Figure 7. Participant's (4 images on the left) and Game Master's avatar (4 images on the right within card template) showdown [13].

In 2016, the concept of active participants in re-creating avatars, clan's banner, appreciation and voting system on game master's presentation materials, Clash of Clans (quiz competition), and developing interactive content as the last group mission gain higher interaction from the participants more than previous gamification concepts. The participants are enthusiastic in creating avatars, background stories, and compete with other clans in Clash of Clans (quiz competition). The students eagerly share their avatars and background stories in facebook group that stimulates reviews and conversation among members (see Figure 6).

Similar treatment applied towards the member of game master assistants. In the previous Techno-Gaia 2014 Gamification Project, logo, identity and visual assets are elaborated by assigned person. Meanwhile, in Kala Isvara 2016 Gamification Project, the team designed a template or guidance for all participants included the game master team members. Instead of one person design, this experiment produces templates for all to use and elaborates as frame that unified everyone's design. The game master and group of participants compete with one another in sharing the contemporary contents that might bring advantage for their professional future (see Figure 7).

Overall, most of the content of ICT mandatories are developed through gamification contexts, especially in missions which needs their perspectives in game such as job or profession (Techno-Gaia), races (Imitation War), or elements they represents (Kala Isvara). Although the utility of gamification experiment in Introduction to ICT course is still done qualitatively, it may be measured quantitatively. Therefore, on the next gamification experiment which will be conducted in early 2018, several quantitative measurements are under development to be applied.

3 Conclusion

There are various results of gamification experiments in Introduction to ICT Development courses on 3 consecutive years, but several things need to be marked.

- There are significant understanding from participants on the role of information and communication technology (ICT) in art and design discipline based on the quality of question asked, how the participants present their works

on certain missions.

- Almost all gamification concepts are successfully creating interaction and playful experiences. The participants' interest, appreciation, and attention towards the course content increase significantly compared to pre-academic year 2013/2014.
- The engagement between participants and game masters are well built through gamification mechanics as Bressington mentioned.
- To make further interaction in gamification as a goal, applying game mechanics through rewarding the participants activities is not sufficient especially for students of Visual Art and Design studies. They need to be challenged through creative artworks and examples to create creative and explorative output.
- Quantitative measurements needs to be applied on the next gamification experiment to validate the previous qualitative gamification experiment results.

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