Improve Student Understanding Ability Through Gamification in Instructional Media Based Explicit Instruction

N Firdausi, H W Prabawa and H Sutarno

Computer Science Education Department, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi No. 229, Bandung 40154, Indonesia
Email: nuruly.firdausi@student.upi.edu

Abstract. In an effort to maximize a student's academic growth, one of the tools available to educators is the explicit instruction. Explicit instruction is marked by a series of support or scaffold, where the students will be guided through the learning process with a clear statement of purpose and a reason for learning new skills, a clear explanation and demonstration of learning targets, supported and practiced with independent feedback until mastery has been achieved. The technology development trend of today's, requires an adjustment in the development of learning object that supports the achievement of explicit instruction targets. This is where the gamification position is. In the role as a pedagogical strategy, the use of gamification performance study class is still relatively new. Gamification not only use the game elements and game design techniques in non-game contexts, but also to empower and engage learners with the ability of motivation on learning approach and maintains a relaxed atmosphere. With using Research and Development methods, this paper presents the integration of technology (which in this case using the concept of gamification) in explicit instruction settings and the impact on the improvement of students' understanding.

1. Introduction
Vocational High School (SMK), according to article 15 of Undang-Undang No.20 of 2003, aimed at preparing students to be able to work in a certain field, which give priority to the development of students' abilities to certain types of work. But, the observations in the field, as stated in Document of Vocational Curriculum 2006, part of Rational curriculum, indicating, mostly graduates of vocational less able to adjust to the changes/developments in science and technology that are not easily trained back up the shortfall. The findings seem to indicate that learning in SMK has not appeared touching on self-development in the adaptability of learners. The study also noted that most graduates obtain vocational school can not be absorbed in the workforce because their capacity is not in accordance with the demands of the working world. The condition was also mapped in the document released by the World Bank in 2011 [1]. The document put the quality of facilities as the main problems of learning in vocational (by 29%), followed by the quality of teaching (by 23%), then a row is a problem with regard to general skills (13%), curriculum and cycle length ( 9%), relevance (8%), teacher skills and specific skills (4%).

Those facts led to allegations that the achievement of competency standards of vocational students are not fully met by the learning device available today. This paper raised the issue with regard to efforts to improve the ability of vocational students' understanding through the use of gamification in setting explicit learning. Understanding ability is a basic capital for student to be able to better interact...
with the material being taught concepts before ultimately concept implemented or developed in accordance with the needs of the problems faced.

Gamification is using elements of game mechanics to provide practical solutions by way of building interest (engagement) certain groups [2]. Gamification not only use the game elements and game design techniques in non-game contexts [3], but also to empower and engage learners with the ability of motivation on learning approach and maintains a relaxed atmosphere. In general, gamification contains some elements of which [4]: a) *games based* (these elements are intended to create a system in which learners or players involved in the abstract challenge, defined by rules, interactivity and feedback to produce measurable results ideally bring out the emotional reactions); b) *game mechanics* (level, earnings badge, point system, score and time challenge is the element used in the gamification); c) *game aesthetics* (how aesthetic experience felt by a person strongly influence or willingness to accept gamification); d) *game thinking* (the idea of thinking about everyday experiences such as jogging turn it into an activity that has elements of competition, cooperation, exploration and storytelling); e) *engagement* (the purpose of the gamification is to get someone's attention and engage the user in a process that's been made); f) *presence of people* (this can be learners, consumers, or the player. Individuals who will be involved in the process of creating and who will be motivated to take action).

### 2. Method

This research was conducted under research and development method, that includes several phases, which are analysing, designing, developing, implementing and evaluating. Learning media implemented to 37 students and 5 teachers that coming from one of the SMK in Bandung. The material presented in learning media is web application publication (especially with regard to the concept of domain and hosting, the principle of elections domain and hosting, and using cPanel application) that obtained in the even semester of the year 2015/2016. Technique of data collection implemented in this study was a test and questionnaire. Test instrument was designed as multiple choice questions with rationality, organized according to conceptual mastery indicators. While, questionnaires were used adopt the LORI instrument which cover interaction usability, accessibility, reusability and standards compliance.

### 3. Result and discussion

#### 3.1. Explicit instruction syntax and gamification

Explicit Instruction model was first introduced by Rosenshine and Steven in 1986. The theory behind this model are the behavioral theory, research on teacher effectiveness, and social learning theory. In general, syntax of explicit instruction [5] are presented in Table 1.

| Phase 1 (A Clear Goal) | Setting the Stage for learning  | Clear explanation of what to do |
|------------------------|---------------------------------|---------------------------------|
| Phase 2 (Some Show & Tell) | Modeling the process (showing) | Guided Practice |
| Phase 3 (Plenty of Practice) | Independent Practice (when teacher is confident students will be successful) | Assessment/Closure (informal or formal) |

Based on three phases syntax (as presented in Table 1), instructional media focused on the first and second phases. In the third phase, independent practice activities managed manually because they relate to applications outside of instructional media. General overview of the media flow is presented in Figure 1. Multimedia developed use gamification elements as shown by Table 2.
Figure 1. Explicit instruction syntax media with gamification flow chart.

Table 2. Gamification concept design.

| Gamification Element | Information |
|----------------------|-------------|
| **Game Mechanics**   | **Level 1** | **Level 2** | **Level 3** |
| Task: Complete the exercises independently form five multiple choice questions (easy problem) | Task: Complete the exercises independently form five multiple choice questions (medium problem) | Task: Complete the exercises independently form five multiple choice questions (difficult problem) |
| **Game Aesthetics** | Aesthetic element in media is the image color. The title of the game is a sky adventure, then the background of the game in the form of a stage at the top of skyscrapers. The blue color is more dominant because customized with the color of the sky |
| **Game Thinking** | Moving to the right, to the left and jump where required to take the red key where the player must face the enemy advance. To deal with the enemy, players must put a bomb that exploded near the enemy and the enemy is lost, then the player must find a strategy to take the red key |
| **Engagement Reward** | Level 1: Getting 20 points for the correct answer. If values > 60, can continue to level 2. | Level 2: Getting 20 points for the correct answer. If values > 60, can proceed to level 2. | Level 3: Getting 20 points for the correct answer. If values > 60, can proceed to final evaluation. |
| **Presence of people** | Only one player who can play |
3.2. The impact of gamification in improving student’s understanding ability
The assessment of media feasibility (before use in the classroom learning) is done through expert judgement that conducted by 2 media expert and 3 teachers, then media tested to 37 student. The summary of assessment shown by Table 2.

Table 3. The result of explicit instruction media assessing by expert.

| Aspect          | Rate |
|-----------------|------|
| Interaction     | 0.836|
| Usability       | 0.815|
| Accessibility   | 0.903|
| Reusability     | 0.850|
| Standards       | 0.817|
| Compliance      | 0.873|
| Software        | 0.887|
| Engineering     | 0.854|
| Learning Aspect |      |
| Visual          |      |
| Communication   |      |

From Table 3, obtained information that media aspect rate is 0.854. It’s means, media has become reasonably well established in provide literature of web application publication. To further strengthen the research, conducted interviews to some students especially to further explore the potential of the media at the same weaknesses that have been developed. In general, given the response of students showed a positive influence, means consciously recognize that students obtain student outcomes (both within each level or in the final evaluation) is a real condition of their mastery abilities in web application publication material. So, it can be said that, gamification is an alternative in making the learning process more interesting, fun and effective.

However, the following questions should be considered whether the concept of gamification is used successfully to build engagement for students or not. Do students really interested and engaged in the learning process with the concept of the game was given? How to challenge and objective can improve students’ proficiency and skills? How instructor/teacher to monitor the progress of the development of students as an evaluation?

4. Conclusion
In the learning process, gamification is an alternative in making the learning process more interesting, fun and effective. Despite using game mechanics, the use of gamification does not mean to make a game. The most important is the right concept, clear goals and capabilities in building engagement for students to learn.

Based on all the discussions that have been described, it can be concluded that the media gamification using explicit instruction give a positive impact on students' understanding. In addition, student responses regarding media gamification using explicit instruction also showed positive results.

5. References
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