

Alphabetical Dice Row: Exploration and Evaluation Tool of Student's Vocabulary Mastery

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Abstract. Nowadays, developing educational games is a challenge to the educators due to the massive modern and non-educational games. This research was aimed to evaluate the value of "Alphabetical Dice Row" as an exploration tool of students' vocabulary mastery, to carry out a trial of the game implementation to the students and to evaluate the performance of students on the gameplay. The research was carried out with research and development design. The prototype of the game was valued by expert and game trial was carried out to the elementary school's students. Expert valuation of the game showed that the "Alphabetical Dice Row" is an excellent game, but still lack in materials, looks and attractiveness aspects. The result of the game trial in the other side showed several difficulties of the students in playing the game. Some limitations such as dice design and limitation of letter were suggested as the major problem in the game application. Therefore, further improvements are required in order to maintain the "fun" and "attractive" aspect of the game. However, the game is currently applicable effectively as the evaluating tool of students' vocabulary mastery.

Keywords: attractiveness, dice, fun, game limitation

1 Introduction

Vocabulary mastery is an important matter to the elementary school students. Vocabulary mastery supports students' ability to learn, not only in the language subject but also any other subjects [1], [2]. Furthermore, vocabulary mastery could affect the academic achievement of the students [3]. On the other side, vocabulary mastery is important in order someone to improve his/her communication skill, such as being able to select the exact word to express their idea [4]. Therefore, improvements of students' vocabulary mastery is mandatory.

Vocabulary is mostly acquired through experience; therefore, vocabulary mastery varies among students. Various factors could affect one's vocabulary acquirement as well as mastery, such as socio cultural background [3], reading and listening habit [5], [6], and social circumstances [7]–[9]. Therefore, one's vocabulary will always get improved as he/she grow up. However, their circumstances would lead to differentiation of vocabulary mastery in specific field.

Vocabulary mastery is needed in any level of education with improved difficulty and complexity. Therefore, students with lower grade or lower education level are suggested to have lower and more dispersed vocabulary mastery [9]. In the case of elementary school students,

limited vocabulary mastery is generally found. Children tend to have common vocabulary due to the common knowledge they obtained.

Understanding students' vocabulary mastery is an important process to provide better teaching strategy. Disparity in students' vocabulary mastery might cause difficulties in teaching-learning activity [9]. Therefore, teachers need to take the students to the approximately similar vocabulary mastery [10]. Thus, exploration of students' vocabulary mastery needs to be carried out.

In order to improve their vocabulary mastery, they should keep exploring so that they could obtain new vocabularies. Vocabulary acquirement could occur incidentally [11]. Thus, any activity which involves reading, listening, speaking and writing has potential to improve vocabulary mastery. The main process of vocabulary improvement is introduction of new vocabularies to the students. Therefore, various methods could be used, such as reading, listening, writing, story dictation [12]–[14],

Elementary school students need to actively improve their vocabulary mastery in order to obtain better learning experience. Unfortunately, students' interest on vocabulary mastery is generally low. Therefore, attractive methods are needed to stimulate students' interest to learn vocabulary [15]. Various learning instruments have been developed in order to support children's vocabulary learning. However, each student may have different preference regarding the method/instrument. Therefore, the more instruments available for the purposes should provide better chance to effectively improve vocabulary mastery. Instead of the function as learning media, some tools could also be used as evaluation tools for vocabulary mastery. For example, several games require its player to recall their memories/knowledge. Thus, it works as improvement and maintaining tool of memory.

Vocabulary learning is important to the students. There are various methods to improve vocabulary mastery, such as reading, writing and interactive multimedia [16]–[18]. However, using formal method would cause the students to get bored [17]. Game is one among the approaches which could be used to improve students' vocabulary mastery in the fun way. It is considered as the effective method to improve children's vocabulary significantly [19]. Among the games used as the tool of vocabulary mastery improvement are puzzle, crosswords [1], quizlet [20] and scrabble [21].

Educational game, especially which are played in groups should have two impacts to the player, including the educating impact and evaluating impact. Children with different level of vocabulary mastery would have transfer of knowledge. Children with more vocabulary would unintentionally provide new vocabulary input to the children with less vocabulary. This is considered as the educating impact. In the meantime, children with more vocabulary are challenged to recall their knowledge of the vocabulary. This is considered as the evaluating impact. Therefore, both types of players would obtain educational benefit during the game.

The research aimed to evaluate the value of "Alphabetical Dice Row" as an exploration tool of students' vocabulary mastery, to carry out a trial of the game implementation to the students and to evaluate the performance of students on the gameplay.

2 Method

The research was carried out through Research and Development (R & D) method. The research was carried out in three steps. The first step was media development, followed by expert valuation and the last was field trial. The prototype, the "Alphabetical Dice Row" was

created using 3D-printer consisted of designated board and dice. Since the “Alphabetical Dice Row” is an invention purposed for vocabulary learning, therefore the game should include the technical guideline of the gameplay. Expert valuation was provided by academic experts. Valuation was carried out to six aspects of the game, including: efficiency, materials, looks, build quality, attractiveness and handbook’s informativeness. Field trial was carried out to several students from the 1st to 6th grade through game play. As many as 68 students were involved in the trial. The game was played in pair for approximately two hours, which gave the students to play for five sets. Data collection on the result of the game trial were including the number of vocabularies formed by the student, group of vocabulary, and five most frequent words. Since the words could be random or even meaningless based on the students’ knowledge, the result was filtered using the Indonesian Dictionary. Therefore, only the words that are contained in the dictionary was used as valid data while foreign words as well as acronym was considered as invalid and removed from the analysis. Descriptive data analysis was carried out to provide information concerning the performance of “Alphabetic Dice Row” as a tool to evaluate students’ vocabulary mastery.

3 Results and Discussion

3.1 Game description

The “alphabetical dice row” is a game purposed to arrange serial letters into words. Therefore, it requires a set of letter dices and playboard. The playboard is designated as square board consisted of 11 blocks horizontal and vertically as the media to place the letter dices to form a word at each row. Each set of playboard consists of one board and 100 dices. There are five formation of dices consisting combinations of letters, including:

- a. Dice 1: A1, N1, H2, Y2, Q3, F3
- b. Dice 2: I1, M1, K2, T2, V3, F3
- c. Dice 3: U1, D1, L2, R2, W3, F3
- d. Dice 4: E1, C1, P2, J2, X3, F3
- e. Dice 5: O1, B1, S2, G2, Z3, F3

Each letter in the dice is followed by a number. The number showed the value (weight) of the letter. The higher the value shows the higher difficulty it has to be used to form a word. The numbers are later used as a tool to value the students’ score based on the word they arrange. Figure 1 shows the look of the playboard and the dices of the “Alphabetical Dice Row”.

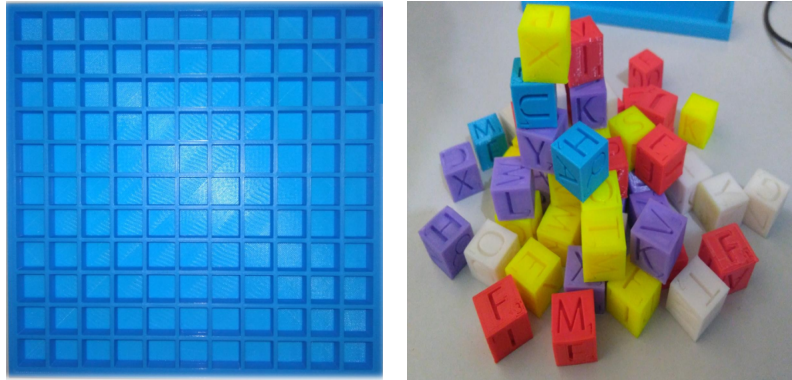


Fig. 1. Alphabetical dice row

3.2 Gameplay

The “Alphabetical Dice Row” could be played effectively by 2 – 4 children. However, each player should have the playboard set in order to have a fairplay. The game is played in turns. The turns is determined by the alphabetical row the players get through blind picking. The game is started by picking nine dices randomly for each player. The number of dices in the player hands should stay constant. Therefore, after using the dices to arrange a word, the player should pick other dices as many as the used dices. The first player should arrange a word on the playboard using the dices in their hands, followed by the second player and so on. The game ends when the board is full or no player can arrange another word. Each word should consist of at least two letters.

3.3 Game valuation

Expert valuation of the game showed that there were some aspects with lack value, including the materials, attractiveness and looks. Among the evaluated aspects, the quality had the highest score, followed by efficiency and handbook’s informativeness. The score of each valuated aspects were: quality – 24; efficiency – 15; handbook’s informativeness – 14; looks – 11; attractiveness – 8; and materials – 7. Total score of the media was 79 which showed an excelent value. However, improvements on the materials, attractiveness and looks are required.

3.4 Game trial

The game trial was carried out only to evaluate media the vocabulary mastery of the students. According to the result, as many as 514 words from 297 unique vocabularies came up during the trial. However, only 484 wors from 278 unique vocabularies were valid. The number of valid words the students arranged was between 2 to 11 words/student with the average of 7 words/student. The analysis result showed that the words could be grouped into 7 vocabulary groups, including noun, verbs, adjectives, adverbs, pronouns, numeralia and conjunction. Based on the analysis ressult, noun was the most dominatn vocabulary group. Noun covers 75.2% of total vocabulary, followed by adjectives with only 11.9%. Among the words, some came up frequently. The most frequent words came up during the trial were: aku (I/me) – 16 times, ayam (chicken) – 10 times, api (fire) – 9 times, apa (what?) – 9 times and sapi (cow) – 8 times.

3.5 Discussion

Games have been used as media of education since ancient times. However, due to the advancement in knowledge and technology, an evolution to the games occurs from traditional games to digital games. Educational games provide the opportunity to the players to develop their cognitive skills [22]. Therefore, educational games should be designed appropriately to provide expected feedback.

According to the expert judgement, the educational game “Alphabetical Dice Row” developed in this research still needs improvements in the aspects of material, attractiveness and looks. Nowadays, developing an attractive educational game is a challenge since there are many other games accessible to children. Educational games should be able to compete the common (non-educational) games. Therefore, the games should provide the content with children’s interest.

The term “game” should carry the image that it is fun [23]. Therefore, it should also be enjoyable. However, overdoing in a game could cause stress [24], [25]. According to Kordaki [22], the design of education game should consider the context, active and constructive participation, scaffolding, content and structure. Due to the advancement of technology, children prefer play the digital games than traditional games. Unfortunately, some games contain violence which could affect children’s behavior [26]. Lazarou [27] suggested the following steps in developing educational game: 1) identification of relevant activity system, 2) identification of motives, needs and expectations, 3) determination of game elements, and 4) development of the game.

Referring to the result of the game trial, it seemed like the students had difficulties in playing the games. It was shown by the low word formation. This could be caused by the limited letter combination and availability. Since the letter is limited, the used letter could not be used again until the game is restarted. This kind of obstacle would cause the player to get stress. Thus, the game would lose the “fun” or “attractive” aspect. Therefore, enrichment of letter combination should be considered in order to reduce the obstacles in playing the game.

Exploration of the vocabulary mastery showed the dominance of nouns as the result followed by adjectives. The limited vocabulary mastery of the students was the main reason for the result. Generally, student’s acknowledgement is limited to their surrounding. Therefore, they tend to acknowledge nouns better than any other groups of vocabulary. However, limited vocabulary of the other groups could also be caused by the limited number of vocabularies itself. Another possibility is the limited letters which could be used to arrange the word. Another vocabulary game “scrabble” uses limited letters as the challenge of knowledge. However, in the “Alphabetical Dice Row” the difficulty level is altered.

The frequency of the students interact with vocabulary would affect how they recall it. The words which are frequently used in daily communication or the objects they frequently see in their daily activities would make it easier to recall. Contrary, it would be harder to recall the word, object or terms they seldom use or see in their daily life. Recalling verbs in Indonesian is rather difficult for children. Verbs in Indonesian generally need prefix or prefix and suffix. Therefore, unless the students know the root word, it would be hard to recall it during the game.

Low vocabulary mastery could occur not only student at lower grades, but also at higher grades [1]. However, each should have minimum vocabulary mastery. Playing educational games focusing on vocabulary should develop interaction between the students with different level of mastery. It is expected to stimulate indirect learning of vocabulary to the students with lower mastery. Well-designed game should be able to develop new knowledge and skill of the player (children) which could be useful during in-class or off-class activities [22].

Low vocabulary mastery lead to the difficulties in accepting and expressing thoughts and ideas in the class [1]. Therefore, vocabulary mastery is important for students in order to develop their knowledge, improve their capability of learning, reading, listening, speaking, and writing [14], [28]–[30]. Using the “Alphabetical Dice Row” clearly could stimulate the students to show their vocabulary mastery. However, according to the result, the game is still lack of several aspects regarding its design as well as its application.

Educational game is expected to help students to improve their learning activity in a fun informal way. However, not every game has significant effect on the students’ cognitive development [21]. This is due to their cognitive preference. Therefore, all students need to find the games appropriate to their cognitive preferences. Based on the trial result, it could be considered that “Alphabetical Dice Row” could be implemented in teaching or evaluating students’ vocabulary mastery. However, further improvements are still needed in order to alter the attractiveness, effectiveness and efficiency of the game.

4 Conclusion

The educational game “Alphabetical Dice Row” has an excellent value as vocabulary learning/evaluating game, but still lack of materials, looks and attractiveness aspects. The game trial indicated that the game seems to have high level of difficulties for elementary school students, therefore it needs more improvements. In the other side, the game could be used as an evaluating tool of the students’ vocabulary mastery.

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