Educational Games Based in Information Technology as Innovation Evaluation Activity in Learning

Ni Kadek Juliantari¹, I Ketut Sudarsana², Ni Komang Sutriyanti², I Nyoman Temon Astawa³, I Dewa Ayu Hendrawathy Putri² and Kundharu Saddhono³

¹STKIP Agama Hindu Amlapura, Indonesia
²Institut Hindu Dharma Negeri Denpasar, Indonesia
³Graduate Program of Universitas Sebelas Maret, Indonesia

*iketutsudarsana@ihdn.ac.id

Abstract. Learning and including its evaluations must be implemented in an innovative and fun way. Student assumptions regarding frightening evaluation activities must be changed by packing them into an IT-based educational games. Based on the results of research and development of educational games that are suitable to be used as an evaluation tool in learning activities is an educational games with crossword and word square. In addition to its fairly simple appearance, this type of educational games is also easy to create and use.

1. Introduction
During this learning evaluation activities become a scary figure for students because the packaging is too formal, which is generally in the form of written tests [4], [6], [8]. Because psychically students experience tension when evaluated, clear evaluation results allow bias. In order for evaluation activities not to be a scary figure for students, teachers need to package innovative evaluation activities in the form of games, which can then be referred to as educative games. Called educative game because the game contains elements of education, both in terms of procedures and the substance of the material contained in the game.

Although using IT-based educational games, there are four considerations that teachers need to keep in mind when evaluating learning, identifying objectives, determining learning experiences, defining standards that can be achieved and challenging students, and honing student skills [1].

2. Methodology
This type of research is qualitative, that is naturalistic research because the research is done on natural condition (natural setting) by using descriptive method. Descriptive method is the exposure of a narrative verbal (storytelling) about events or processes. Thus, in data processing and research results all use descriptions of researchers.

The research method used is Research and Development (R & D). The selection of research methods is done because researchers want to develop media evaluation with educational games based on IT. This is in accordance with the opinion of Borg and Gall (1988) which states that, research and development is a research method used to develop or validate the products used in education and learning [7]. The author seeks to develop an evaluation medium with an IT-based educational game. For that required validation of the media.
Furthermore, the procedures in this development study apply the ADDIE procedure. This model consists of five main stages, namely (A) analysis, (D) design, (D) development, (I) implementation, and (E) evaluation [5]. Research and development methods are methods used to produce a particular product. The ADDIE development procedure, in the development stage of Borg & Gall, only reaches the fifth stage. Research and development is started from the analysis to find the goal, until the last stage of the fifth evaluation with the number of 19 subjects.

3. Result and Discussion
The analysis in this study was conducted on the analysis of potential, problem, literature review, competence, instructional objectives, materials and development of learners. From the results of the analysis obtained data sebegai following:

1) Analysis Phase
   a. Potential analysis
      There is potential that supports the use of educational games based on IT. The potential is the willingness of teachers to innovate and creatively package evaluation activities
   b. Problem analysis
      Problem analysis is done by interviewing with resource person. The interview results indicate that the monotonous teacher performs manual evaluation activities or by written test. This way of causing a sense of boredom and quite stressful for students.
   c. Analysis of literature review
      Based on the potential and existing problems of researchers trying to find a solution. The solution is based on literature review conducted by the researcher. Furthermore based on the potential and the problem, developed media evaluation of learning in the form of educational games based on IT.
   d. analysis of core competencies and basic competencies
      Researchers analyze the competencies that exist in the object of the material to be developed through the scope of learning that is reflected in core competencies and basic competencies. This development only refers to the cognitive domain, so the content chosen is the basic competence in the cognitive domain.
   e. Instructional analysis
      Instructional analysis in the development of educational games based on IT is done by elaborating and developing core competencies and basic competencies into the indicators that must be achieved.
   f. Analysis of the characteristics of students
      Piaget's theory of the development of children's ability is conveyed that there are stages of child development ability in learning. According to him, elementary school children (8-11 years old) are still in concrete operation phase, in addition to the world of children is a world of play so it is considered relevant to use educational games based on IT in learning or evaluation.

2) Design Phase
   In the design phase, it was found that the design concept of the IT-based educative game consists of seven steps: 1) choosing an educative game model, 2) designing the game according to the chosen model manually, 3) compiling the questions, 4) creating the answer key, and 5) change the design made manually into IT-based. The designs created are crosswords and word square models.

3) Development Stage
   The steps undertaken in the process of development and production consists of several stages, to determine the stage following the researchers describe step by step in the development and production. The steps are, as follows: 1) compile the questions and answer keys, 2) arrange the key answers in
such a way as to fit and meet each other on the crossword, 3) change the manual design that has been designed to be IT-based. Furthermore, it is validated by media experts, material experts, and users.

**Table 1. Media Expert Validation**

| No. | Aspects of the Assessment                        | Phase I     | Phase II |
|-----|------------------------------------------------|-------------|----------|
| 1   | Content conformity indicator                    | Good        | Good     |
| 2   | Display indicator                               | Enough      | Good     |
| 3   | Indicators of conformity of the principle of development | Enough | Good     |

**Table 2. Material Expert Validation**

| No. | Aspects of the Assessment | Phase I     | Phase II |
|-----|----------------------------|-------------|----------|
| 1   | Indicators of conformity  | Good        | Good     |
| 2   | Feasibility indicator     | Enough      | Good     |
| 3   | Presentation indicator    | Good        | Very good|
| 4   | Indicator of competence   | Good        | Very good|

**Table 3. User Validation**

| No. | Aspects of the Assessment | Phase I     | Phase II |
|-----|----------------------------|-------------|----------|
| 1   | Indicators of conformity  | Good        | Good     |
| 2   | Feasibility indicator     | Good        | Good     |
| 3   | Presentation indicator    | Good        | Very Good|
| 4   | Indicator of competence   | Good        | Very Good|

4) Implementation Stage

After an IT-based educational game is declared viable as a learning evaluation tool, the next step is to test it. Implementation is done in two stages, namely small group of 5 students and application in class IV SD Negeri 5 Karangasem.

Based on the implementation of the educational games, the students then provide an assessment or response to the IT-based educational games. The student's assessment or response is done by a questionnaire (yes-no) tailored to what is perceived by the student after the evaluation of the game by means of the educative games. The following is a student response to the results of the experiments applied.

**Table 4 Trial Results by 5 Students of Class IV SDN 5 Karangasem**

| No. | Aspects of Average | Score | Percentage of Eligibility Score |
|-----|-------------------|-------|---------------------------------|
| 1   | Ease of Use       | 5     | 100%                            |
| 2   | Conformity with the material | 5 | 100%                            |
| 3   | Interesting design | 4     | 80%                             |
| 4   | Systematics dish  | 4     | 80%                             |
| 5   | Clarity of questions | 5     | 100%                            |

**Table 5 Trial Results by Students of Class IV SDN 5 Karangasem**

| No. | Aspects of Average | Score | Percentage of Eligibility Score |
|-----|-------------------|-------|---------------------------------|
| 1   | Ease of Use       | 18    | 94,74%                          |
| 2   | Conformity with the material | 17 | 94,44%                          |
| 3   | Interesting design | 19    | 100%                            |
| 4   | Systematics dish  | 18    | 94,74%                          |
| 5   | Clarity of questions | 18    | 94,74%                          |
5) Evaluation
Evaluation is used to refine the product, the evaluation is based on the overall suggestion of the media and material experts, as well as the student response outcomes. IT-based educational games are considered good for learning evaluation activities, so there is no suggestion for improvements to the game. Thus, the IT-based educational games of crossword and word square models are considered appropriate tools for learning evaluation activities, particularly in the cognitive domain. This kind of development research has been done by Mulyadi, Nurdin, and Waslaluddin in 2011 under the title of Multimedia Learning Interactive Learning CAI Model Instructional Games to Improve Student Learning Motivation. The result of research and development shows that (1) almost all students of class X2 SMA Negeri 2 Cimahi give positive response about learning using multimedia instructional games learning, (2) multimedia instructional games that have been developed is considered very good and feasible to use with average average percentage of feasibility 81.03% by media expert and 91.90% by expert material, (3) student give very good appraisal to instructional games multimedia multimedia with appraisal percentage 85.16%; (4) there is an increase of 6.02 % of student motivation questionnaire results before and after using multimedia instructional games [2]. Based on these results, it is known that the game model is relevant to use in learning activities or learning evaluation. Moreover, the evaluation of learning in elementary school students who are generally happy with the game because it is still in the phase of children. The knowledge and understanding of the material is covertly obtained by the students in the educational games conducted.

4. Conclusion
From the results of research and development of educational games based on IT that have been done in SDN 5 Karangasem, obtained data showing that educational games based on IT worth to use. These data are obtained from validation by material and media experts as well as data from student responses. Therefore, it can be generally concluded that educational games based on IT, especially crossword and word square models are worthy of being used as a tool in the learning activities of Hindu Religious Education in grade IV of elementary school.

References
[1] Arifin. 2004. Evaluasi Pengajaran Bahasa (Pendekatan, Pengolahan dan Penggunaan Validitas, Reliabilitas, Portofolio, Bentuk Tes Keterampilan Berbahasa). Program Studi Pendidikan Bahasa Indonesia, Program Pascasarjana, Universitas Negeri Malang.
[2] Mulyadi, Nuradin, dan Waslaluddin. 2011. Pengembangan Multimedia Pembelajaran Interaktif CAI Model Instructional Games untuk Meningkatkan Motivasi Belajar Siswa. Jurusan Pendidikan Ilmu Komputer, UPI Bandung.
[3] Mutiara, Latifa. 2013. 68 Game Kreatif Pembuka dan penutup Kelas. Yogyakarta: Langensari Publishing.
[4] Nurgiyantoro, Burhan. 2001. Penilaian dalam Pengajaran Bahasa dan Sastra. Yogyakarta: BPFE.
[5] Pribadi, Benny A. 2011. Model Desain Sistem Pembelajaran. Jakarta: Dian Rakyat.
[6] Rafii, Suryatna. 1985. Teknik Evaluasi. Bandung: Angkasa Bandung.
[7] Sugiyono. 2009. Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta.
[8] Wahyuni, Sri. 2004. Modul Matakuliah Evaluasi Pembelajaran Bahasa dan Sastra Indonesia. Malang: Universitas Islam Malang.