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Development of Content Learning System Blended Learning on Salt Hydrolysis Material for Grade 11th Senior High School (SMA/MA)

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Abstract:- The aims of this study is to make a valid and practical e-learning on salt hydrolysis, for grade 11th Senior High Schools (SMA/MA). This research used is Research and Development (R&D) type with ADDIE development model that have 5 stages, namely (1) analyze, (2) design, (3) development (4) implement, and evaluate. The instruments that used were interview sheets, validity sheets and practicality sheets. The data obtained were proccessing using the Formula for Cohen's Kappa. Based the results of the content validity test, the average kappa moment was 0.87 with a very good category of validity and a construct validity test of 0.93 with a Very good category of validity. The practicality of the teacher obtained an fair rate of the kappa moment of 0.89 with the Very good practicality category, while the students have the rate of 0.80 with the category of Good practically group. From the result of this study, it can be resume that e-learning on salt hydrolysis material is valid and practical, so it can utilized in learning activities, paticullary in the study of salt hydrolysis.

Keywords:- *Content Learning System Blended Learning, salt hydrolysis, ADDIE.*

I. INTRODUCTION

The development of technology and information in the 21st century has changed one's perspective on learning, changing the nature of work from manual to computer-based [1]. The growth of 21st century must make sector of education to create resources that are critical, adaptable, to any changes and developments that occur [2].

Currently, we are entering the 4.0 revolution of industrial where technology is able to replace the role of humans in doing various jobs. The 4.0 revolution of industrial efect education era so the education must uses the learning process based on digital technology . It can make the learning activity be more flexible and not limited by time and space[3].

The age of education 4.0, which is characterized by a combination of technological skills and human skills such as creativity, critical thinking, problem solving, communication, collaboration, and empathy, needs to be developed optimally [3]. The demands of this era require students to have the skills to be able to accompany technological developments. Among these skills is the ability to think critically, where the ability to think critically is the goal of the Gooder order thinking skills learning system. Gooder order thinking skills are a process of thinking of students at a Gooder cognitive level that is developed from various cognitive concepts and methods and learning taxonomies [4]. Gooder-order thinking skills become the foundation for implementing the revised 2013 curriculum. The demand for the 2013 curriculum is to make students more critical and creative [3]. Thus, it is necessary to practice Gooder-order thinking skills. Through effective learning activities, it is hoped that the thinking process of students can develop.

In essence, along with the development of science and technology, it requires innovation and transformation in learning. If the development of science and technology still maintains a conventional system (face-to-face) without being supported and combined with current technology, knowledge in the world of education will be left far behind. Although the use of conventional methods has the advantage of being able to make students have the same view in a short time and learning objectives can be conveyed easily [5]. However, conventional learning does not answer the challenges of the 21st century, for that it is necessary to apply learning that uses technology, namely online learning.

Online learning is learning that uses electronic circuits to convey learning content, interaction, and guidance [6]. Online learning or what is often referred to as e-learning will provide results in accordance with the expectations of teachers and students and is more effective. However, the learning process that only applies e-learning cannot be fully successful. This is because the learning styles of each student are different. In addition, the intensity of meeting between students and educators is very minimal and it is difficult to be able to socialize between students [7]. For this reason, a combination of conventional (face-to-face) learning with online learning that utilizes digital technology is required. This combination can take advantage of the commonly used "MOODLE" type content learning system. The combination of this learning system is called a Content Learning System-Blended Learning.

The combination of direct learning with online learning has not been widely applied to chemistry learning. Learning is still separate from the choice of direct learning systems or online learning by students themselves without any control or

guidance from the teacher. In fact, the combination of direct learning with online learning has grown rapidly. This is marked by the most recent research on Blended Learning that has been done. The application of Blended Learning to various subject matter can increase students 'motivation in learning [8], student learning outcomes [9], student learning achievement [10] and students' critical thinking skills which are part of Gooder order thinking skills [2] .

II. METHODOLOGY

This research is a type of research and development (R&D), which is research used to produce certain products and test the effectiveness of these products [11]. The product in this study is in the form of e-learning on salt hydrolysis material for class XI SMA/MA. The development model used in this research is the ADDIE type that consists of five procedures, namely analyze, design, development, implement, and evaluate [12].

Data type in this study is primary data. The primary data in question is data obtained directly from lecturers, teachers and students which is taken through a validity and practicality testing questionnaire. The research instrument was a questionnaire consisting of a validity sheet and a practicality sheet. The data obtained were analyzed using the kappa cohen formula [13].

$$moment\ kappa\ (k) = \frac{P - Pe}{1 - Pe}$$

Explanation:
k = The validity of product that shown in moment kappa
P = proportion that has been realized, counted with number given by validator based on max value
Pe = proportion that has not been realized, counted with reduction from max number from validator by the maximum value

Table 1. Kappa Moment (k) Decisions Category [13]

Intervals	Category
0.81 – 1.00	Very good
0.61 – 0.80	Good
0.41 – 0.60	moderate
0.21 – 0.40	Low
0.01 – 0.20	Very low
≤ 0.00	Very low

III. RESULT AND DISCUSSION

The outcome of this study is e-learning moodle that use in learning process. This oucome is mixed between online learning and offline learning so that it is called blended learning. The development of this type of learning is using ADDIE development model as follows:

1. Analyze

In this Analyze procedure there is data collection from four different chemistry teacher based on interview and questionnaire. It show that there is no e-learning used for hihg school and chemistry and there is no mixed between online and offline learning.

2. Design

At this design stage, the design is carried out in the preparation of e-learning on the salt hydrolysis material that will be developed. The e-learning arrangement was made using the Adobe Illustrator application, Microsoft Power Point 2010, Adobe Photoshop CS3, Kinemaster, Format Factory and Exame View. These applications have their respective uses to support the development of this e-learning.

3. Development

Conducted content validation testing and construct validation is doing by researcher at this procedure. From the value of kappa moment (k) found that content validation value is 0.83, while 0.93 is value of construct validation. That value shown Very good validity result of blended learning.

Table 2. Result of Content Validation

No	Rated component	K value	Category
1	Information and Guides	0.90	Very good
2	Content	0.87	Very good
3	Evaluation	0.83	Very good

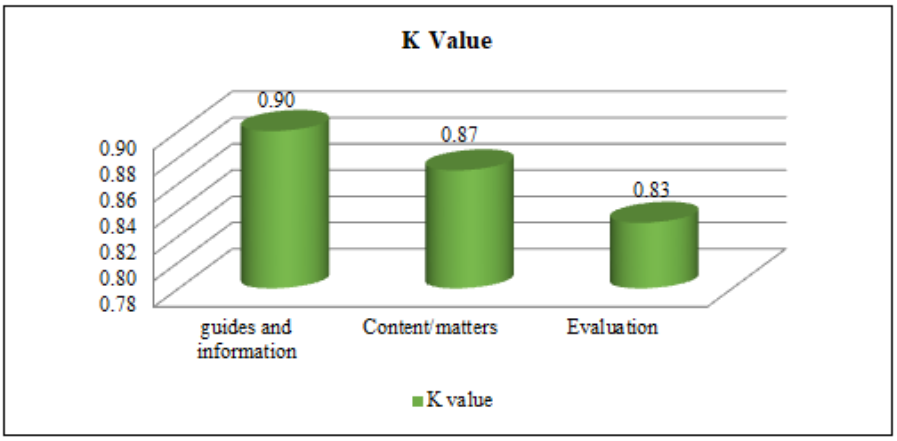

Figure 1. Graph of result from content validation

Table 3. Construct validation result

No.	Rated component	K value	Category
1	Information and guides	0,95	Very good
2	Program Performance	0,95	Very good
3	Average Value of Systematics, Aesthetics, Narrative and Audio Quality	0,90	Very good

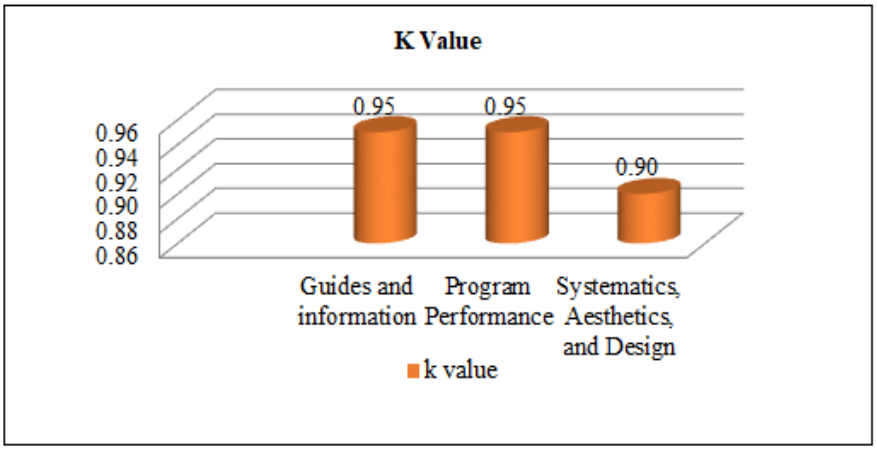

Figure 2. Graph of result from construct validation

Based on the development that has been done, it is obtained product of learning method that can be using online from (http://elearning.berkahprimasains.com/login/index.php) as shown in Figure 3.

Figure 3. Logging in design page of e-learning

This e-learning showed in word and also in video that linked to YouTube. There is also a guideline for teacher and students to use this e-learning so it can help teacher and students to use this e-learning. This e-learning also includes basic competencies and competency achievement indicators as learning standards students must have. When the direction of learning is more detailed it will help student to have standart understanding about material.

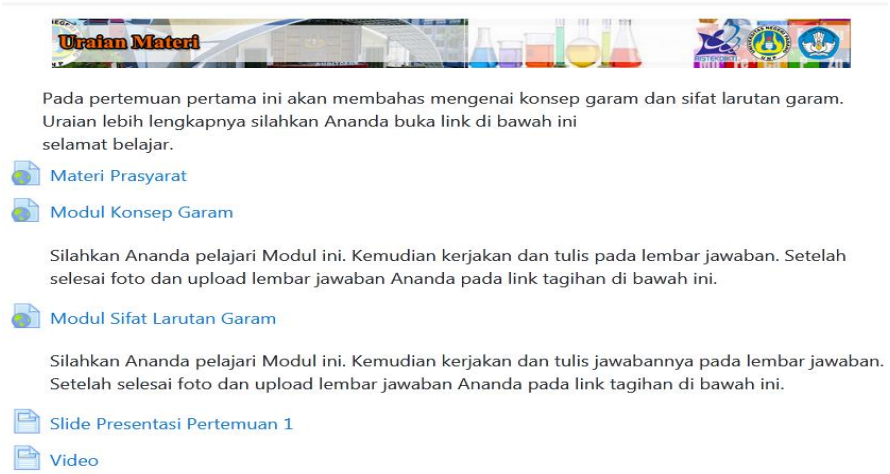

Figure 4. Material Description

Then Figure 4 show the description of the material from multiple sources, modules, power points, and videos. The multiple learning resources will help students to get solutions because they have different styles of learning. The learning design must pay attention to students, because each student has different type. This learning style is verbal, visual, combination and so on. Furthermore, this e-lerning also includes a discussion forum. The outcome of this forum is to make student can solve problem, increase the understanding and answering question[14]. Teacher role in this discusions is to control the source of this discusions. can be seen in Figure 5.

Figure 5. Discussion

Furthermore, in this e-learning there are also exercises, assignments and daily tests. Exercises are done by students during class hours while assignments are done outside of learning hours where students have to submit their task in the photos template, words and pdf. This used to measure learning outcome of students. The design of this task is objective question. The result of this task can be seen by students [15, 16].

4. Implementation

At the implement stage, practical results were obtained from teachers and students. From the result of kappa moment (k), it was obtained 0.89 teacher practicality, and for students practicality it was 0.80. These result show that blended learning has a Very good practicality of the teacher's essence and Good of the student

Table 3. Practicality Results

		Teacher		Student	
No	**Rated component**	**K value**	**Category**	**K value**	**Category**
1	Information and Guides	0.88	Very good	0.79	Good
2	Content	0.86	Very good	0.78	Good
3	Activity	0.92	Very good	0.81	Very good
4	Evaluation	0.83	Very good	0.82	Very good
5	Design and Media Facilities	0.89	Very good		
6	Pedagogical Effect	0.93	Very good		

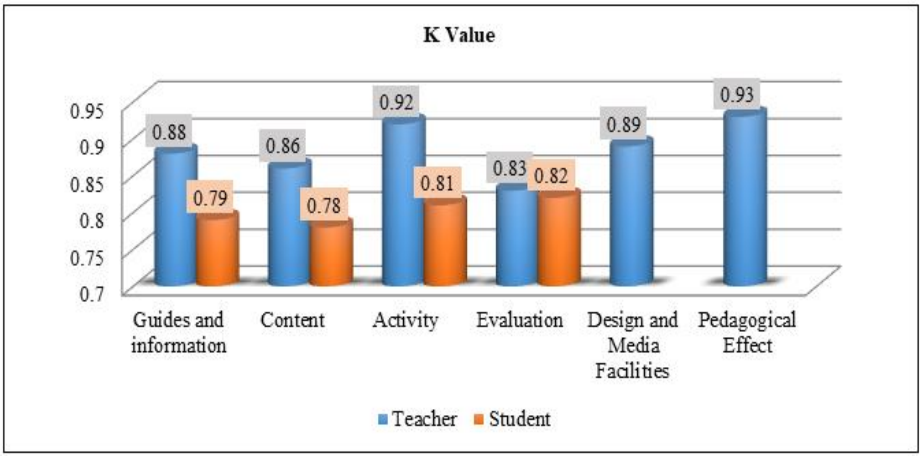

Figure 6. Graph of practicality results

5. Evaluate

This stage describes the evaluation of the development of e-learning on salt hydrolysis. Evaluation is carried out starting from the analyze, design, develop, and implement stages. This evaluation produces product revisions that function to improve the product being developed.

IV. CONCLUSION

Content validation result show that each was value 0.90 for the Information and guides; Content 0.87; and Evaluation 0.83. From this result, it can be seen that the content validity has a Very good interpretation. The construct validation result, it includes Information and guides; Program Performance; and Systematics, Aesthetics, Narrative and Audio Quality and Design in E-Learning are 0.95 respectively; 0.95; and 0.90. It is shows construct validity has a Very good interpretation. Then the practical outcome obtained each 0.88 for guidance and information; 0.86 for content / materials; 0.92 for activities; 0.83 for evaluation; 0.89 for design; and 0.93 for pedagogical effect. From this section, it can be seen that the practicality of the teacher interpretation is Very good. Based on practical outcome of students include 0.79 for guidance and information; 0.78 for content / materials; 0.81 for activities; and 0.82 for evaluation. This part looked very tall except for the guide and information; and content / material. If it viewed a whole content validation the value is 0.87 and 0.93 for construct validation and for practicality of teachers and students have a value of 0.89 and 0.80. It is show that e-learning products have Very good validity and Very good practicality from teachers and Good levels of students to used as learning design for Chemistry in Senior High Schools and Madrasah Aliyah, paticularly on salt hydrolysis.

REFERENCES

[1]. A.A. Mardliyah, Budaya Literasi Sebagai Upaya Peningkatan Keterampilan Berpikir Kritis Di Era Industri Revolusi 4.0, Seminar Nasional Penelitian dan Pengabdian Masyarakat (2018).

[2]. F.D. Cahyadi, Suciati, R.M. Probosari, Penerapan Blended Learning Dalam Pembelajaran Biologi Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa Kelas XI IPA 4 Putra SMA RSBI Pondok Pesantren Modern Islam Assalaam Sukoharjotahun Pelajaran 2011/2012, Pendidikan Biologi 4 (2012).

[3]. D.S. Nahdi, Mengembangkan Keterampilan Berpikir Tingkat Tinggi (Gooder Order Thinking Skills) Siswa Dalam Pembelajaran MatematiKA, Elementaria Edukasia 2 (2019).

[4]. R. Prasetya, Wibawa, D.R. Agustina, Peran Pendidikan Berbasis Gooder Order Thinking Skills (Hots) Pada Tingkat Sekolah Menengah Pertama Di Era Society 5.0 Sebagai Penentu Kemajuan Bangsa Indonesia, Equilibrium 7 (2019).

[5]. M. Moestofa, M.s. S, Penerapan Model Pembelajaran Berdasarkan Masalah Pada Standar Kompetensi Memperbaiki Radio Penerima Di SMK Negeri 3 Surabaya, Pendidikan Teknik Elektro 02 (2013).

[6]. Z.C.A. Dalu, M. Rohman, Pengembangan E-Learning Sebagai Media Pembelajaran Simulasi dan Komunikasi Digital bagi Siswa SMK, JUPITER 4 (2019).

[7]. D.N. Wardani, A.J.E. Toenlioe, A. Wedi, Daya Tarik Pembelajaran Di Era 21 Dengan Blended Learning, JKTP (2018).

[8]. N. Aeni, T. Prihatin, Y. Utanto, Pengembangan Model Blended Learning Berbasis Masalah pada Mata Pelajaran Sistem Komputer, IJCET 6 (2017).

[9]. G. Sandi, Pengaruh Blended Learning Terhadap Hasil Belajar Kimia Ditinjau Dari Kemandirian Siswa, Jurnal Pendidikan dan Pengajaran (2012).

[10]. D. Pratiwi, Sugiharto, B. Mulyani, Efektivitas Model Blended E-Learning Cooperative Approach Tipe TGT Dilengkapi Modul Terhadap Prestasi Belajar Kimia Materi Pokok Hidrokarbon Kelas X Semester Ii Sma Negeri 5 Surakarta Tahun Ajaran 2011/2012, Jurnal Pendidikan Kimia 2 (2013).

[11]. Sugiyono, Metode penelitian pendidikan : (pendekatan kuantitatif, kualitatif dan R & D), Alfabeta, Bandung, 2012.

[12]. S. Amri, Pengembangan Dan Model Pembelajaran dalam Kurikulum 2013, Prestasi Pustaka, Jakarta, 2013.

[13]. S. Boslaugh, Statistics in a Nutshell: A Desktop Quick Reference, o'reilly, Beijing, Cambridge, Famham, Köln, Sebastopol, Taipei,Tokyo, 2008.

[14]. A. Mudlofir, E.f. Rusydiyah, Desain Pembelajran Inovatif, Rajawali Pers, Jakarta, 2016.

[15]. Sriadhi, Khaerudin, N. Wahyuningtyas, Darni, R. Zainul, M. Adri, Rusdinal, Nasrun, Rahmulyani, Nuranjani, Nurmaniah, A. Wedi, E. Surahman, E.N. Aisyah, H.I. Oktaviani, R.S.M. Meilanie, S.N. Purnamawati, Hapidin, W.D. Listyasari, Irsyad, Syafril, Anisah, Y. Santoso, Muhardi, A. Kristanto, Lamijan, H. Susarno, D. Kuswandi, R. Wardani, E. Adnan, Development of Moodle-based Content Learning System in MKDK Student Development Subjects at LPTK in Indonesia, Journal of Physics: Conference Series (2019).

[16]. R. Zainul, M. Adri, Sriadhi, Khaerudin, N. Wahyuningtyas, Darni, Rusdinal, Nasrun, Rahmulyani, Nuranjani, Nurmaniah, A. Wedi, E. Surahman, E.N. Aisyah, H.I. Oktaviani, R.S.M. Meilanie, S.N. Purnamawati, Hapidin, W.D. Listyasari, Irsyad, Syafril, Anisah, Y. Santoso, Muhardi, A. Kristanto, L.H. Susarno, D. Kuswandi, R. Wardani, E. Adnan, Development of e-Learning Courses for Subjects about 'Learn and Learning' with Moodle-based for Prospective Teacher in Indonesia, Journal of Physics: Conference Series (2019).