Edutainment Module Development with Sway in Electrical Power Installation Subjects

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Abstract. This study aims to produce a website-based edutainment learning module using Microsoft Sway with the research subject is students from class XII TITL at one of Vocational High School in Batam (SMKS Islam Hang Tuah) in first semester of the 2021/2022 Academic Year. This research is conducted based on research and development (R&D) with a 4D development model. The data analysis is carried out by testing the validity, practicality, and effectiveness of KD 3.11. The validity test of the module has been done by three validators consisting of two lecturers from Department of Electrical Engineering, Universitas Negeri Padang and a teacher from SMKS Islam Hang Tuah an the practicality test of the module is given to a teacher and 24 students from the same school. Meanwhile, the effectiveness test of the module uses an evaluation test given to students after learning with the module. The module validation results are 87.2% with a very valid category obtained from the average score of 3 validators. The score of the practicality of the module by the teacher is in the very practical category and by students in the very practical category. The learning outcomes of students after using the module were 20 students who completed out of 24 students, so that the module can be said to be effective. The results of the study can be concluded that the module is valid, practical, and effectively used for the subject of Electrical Power Installation in XII TITL class of SMKS Islam Hang Tuah Batam.

1. Introduction

The education, science, and technology are becoming increasingly intertwined, necessitating human development as well. The discipline of strengthening human resources engaged in it must also be the main trigger point behind it[1]. The quality of human resources is determined by internal factors and external factors that are interconnected each other. The internal factors are closely related to students' motivation or interest in learning while the external factors related to the their environment. Student learning outcomes are influenced by various things and it depends on the teacher's preparations to provide the appropriate learning. The teacher should present the concepts to be studied both orally and in writing, the relevant examples when discussing learning materials, and provides reinforcement once the discussion session is accomplished[2].Education is the main actor in shaping the educated young generation. In the 2013 Curriculum, educators act as facilitators and designers of teaching materials which can be in the form of learning media, LKPD, and also learning modules, so that students are able to achieve learning goals in accordance with graduate competency standards. [3]. The success of students in learning can be seen from the way educators determine and apply appropriate teaching methods. However, the success of a lesson is also influenced by several other related factors, one of which is the learning module.

The use of modules is one of the ways in using media in learning to improve the quality of student learning outcomes [4]. The learning module has qualities such as being the shortest and most thorough teaching unit, as well as being a series of lessons and learning objectives that are clearly stated so that students can learn independently[5]. Teaching materials are a source of learning materials that will be taught later, nevertheless, the lack of suitable teaching materials, as well as less appealing teaching materials, will be anobstacle to learning. As a result, one strategy to overcome the hurdles that students face is by using the teaching materials that are easily to understand.

The development of the learning module is based on edutainment. The term of edutainment comes from the words education and entertainment. The educational entertainment is defined as entertainment that is structured to both educate and entertain people.[6]. The combination of these two terms or concepts is essentially human nature, namely playing, which allows students and educators to continue learning without a rigid relationship. The developed edutainment module will be displayed using Microsoft Sway. As seen in Figure 1, Sway can be utilized as a web-based presentation application withfeatures provided by Microsoft such as merging text, images, video, and sound[7] [8] [9] and it can be accessed using the link https://sway.office.com/.
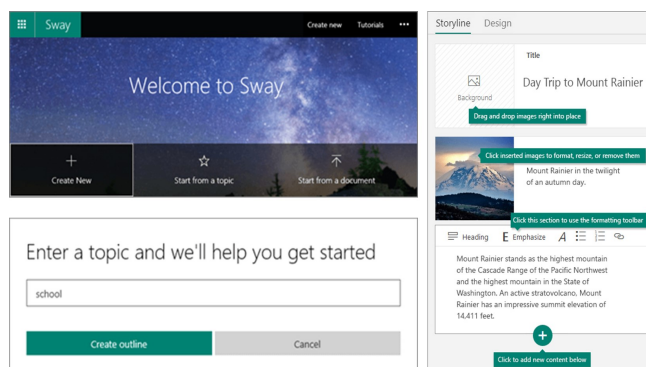

Figure 1. Sway Storyline

According to the results of observations and interviews conducted in September 2020 with the subject is a teacher of Electrical Power Installation at the Hang Tuah Islamic Vocational High School in Batam, one of the reasons that causes students appear to be less interested in the learning process and in completing the tasks assigned by the teacher. This resulted in 16 out of 24 students receiving skor of learning outcomes in this subject below *Minimum Completeness Criteria* set at schoolwhich is 65 with a completion percentage of 57.14 percent. The learning process is said to be successful or effective if the level of completeness of students in a subject equals or exceeds 75 percent of the total number of students in the class[10]. Another reason is that the available learning modules are not yet practical thus students are unable to utilize them optimally. Both teachers and students experience difficulties regarding to this issue especially when they have to perform the distance learning.As a result, the students tend to feel bored and unmotivated during the learning process. The developed modules consist of competency standards, descriptions, learning indicators, learning objectives, descriptions of learning materials, summaries, tests, answer keys, evaluations, and bibliography [11][12][13].

Based on the description above, an edutainment learning module is developed using a valid, practical, and effective Microsoft Sway that makes it easier for teachers and students to study independently anywhere and anytime online, and can improve students' knowledge, understanding, and academic achievement.

Based on the above description, an edutainment learning module is developed using a valid, practical, and effective Microsoft Sway that allows teachers and students to studyindependently, anywhere and anytime. It also can help students to improve their knowledge, understanding, and academic achievement.

2. Methodology

The research method appliedin this research based on the Research and Development (R&D) with a 4D develompment model. This method is used to produce products that are longitudinal or sustainable and appropriate to improve accountable learning [14] [15] [16]. The type of research and development method used to produce the product is by testing the

validity, practicality, and effectiveness of the product. The subject of the research is the teaching module for Electrical Power Installation of the class XII TITL at the Hang Tuah Islamic Vocational High School (SMKS) in Batam with 24 students as respondents and 1 subject teacher in the Odd Semester of 2021/2022 academic year. Thestages to perform this researchare categorized as follows: (1) Define; (2) Design; (3) Develop ; (4) Disseminate. . In general, the module development procedure can be seen in Figure 2 [17].
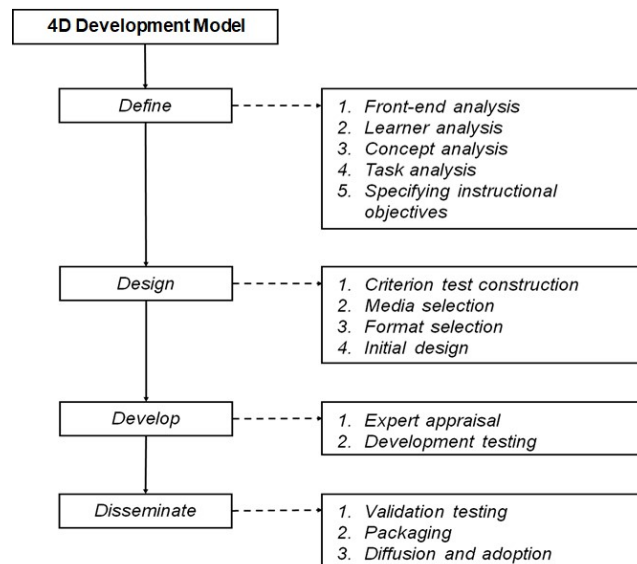
Figure 2. The stages to perform the research

2.1. Product Validity

Product validity will be assessed using a validity sheet in the form of a questionnaire. The validity sheet is used to measure the level of validity of the developed module. The assessment will be carried out by three validators with two validators are the lecturer the Department of Electrical Engineering, Faculty of Engineering, Universitas Negeri Padang and another validator isa teacher teaching Electrical Installation subject in Class XII TITL at SMKS Islam Hang Tuah Batam.

The module validity analysis technique isperformed to observe the data on the validity results of the developed module. Validity assessment is done by giving a score from 1 to 5 according to the Likert Scale. The validity resultsare then analyzed using the equation 1.

$$Validity\ Score = \frac{total\ score\ obtained}{maximum\ score}\ x\ 100\% \qquad (1)$$

The module validity category is classified with a value of 80-100% as a very valid category and so on as shown in Table 1 [18].

Table 1. Validity Assessment Guidelines

No	Achievement Rate (%)	Category
1	80-100	Very Valid
2	60-79	Valid
3	40-59	Quite Valid
4	20-39	Less Valid
5	0-19	Not Valid

2.2. Product Practicality

The practicality of the product will be assessed using a practicality sheet in the form of a questionnaire. The practicality sheet is used to measure the practicality of the developed module. The assessment will be carried out by subject teachers and students of class XII TITL at SMKS Batam.

The module practicality analysis technique is carried out to see the practical results data on the developed module. Practicality assessment is done by assigning a number from 1 to 5 according to the Likert Scale. The data obtained from the practicality of the module are then analyzed using the equation 2.

$$Practicality\ Score = \frac{total\ score\ obtained}{maximum\ score}\ x\ 100\% \qquad (2)$$

The practicality category of the module is classified with a value of 80-100% as a very practical category and so on as shown in Table 2 [18].

Table 2. Practicality Assessment Guidelines

No	Achievement Rate (%)	Category
1	80-100	Very Practical
2	60-79	Practical
3	40-59	Quite Practical
4	20-39	Less Practical
5	0-19	Not Practical

2.3. Product Effectiveness

The effectiveness of the product will be assessed by conducting a module evaluation test to students after applying this module in the learning activities. The product effectivenesscan be measured when the module used by the teacher can improve the quality and learning achievement of students. A class is said to be complete in learning (classical completeness) or effective learning if the graduation rate of students is equal to or more than 75% of the student'stotal numberin the class and the their learning outcome score in this subject are not below *Minimum Completeness Criteria* set at school which is 65.

3. Results and Discussion

The module development procedure uses a 4D development model comprising 4 stages. Define, design, develop, and disseminate. The stage 1 is done by preliminary analysis, student analysis, concept analysis, task analysis, and formulation of learning objectives. The analysis is performed to meet the conditions and facts and problems apperaed during the learning process with the findings that the use of modules during learning is not yet practical. The modules used by teachers are no longer relevant to the current situation and conditions, where schools implement distance learning. The results of the analysis from stage 1 will be used for stage 2 design or design. Phase 2 consists of compiling test criteria, selecting media, selecting formats, and initial design. At this stage it is determined that the module will be designed using a website-based media, namely Microsoft Sway. Stage 3 develop or development is carried out by carrying out expert assessments and development tests so that the module is valid, practical, and effectively used, before proceeding to stage 4 disseminate or dissemination. The module is only distributed to teachers of Electrical Power Installation subjects at the SMKS Islam Hang Tuah in Batam. The module can be accessed via a QR Code as shown in Figure 5 or by accessing the link: https://linktr.ee/moduledutainmentitl.
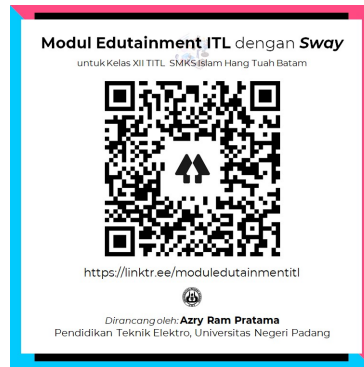
Figure 5. QR Code Edutainment Module

3.1. Validity Analysis

As mentioned previously, the validation has been carried otu by professional validators. The recapitulation of the module validity test results can be seen in Table 3.

Table 3. Module Validity Test Results

No	Validator	Percentage Validity	Category
1	Media Expert	93,6%	Very Valid
2	Material Expert	82,4%	Very Valid
3	Teacher	85,6%	Very Valid
	Average Module Validity Test Results	87,2%	Very Valid

According the results illustrated in table 3,the average percentage of validity results received from three validators is 87.2% with a very valid category. These results are then continued by following improvements and suggestions from the validator such as writing learning objectives that should follow the ABCD pattern, increasing interaction activities in the module, completing the module with examples in everyday life, and following the module writing format.

3.2. Practicality Analysis

The module practicality sheet is filled out by the subject teacher and 24 students in classXII TITL SMKS Islam Hang Tuah Batam. The summary of the module practicality test results can be seen in Table 4.

Table 4. Module Practicality Test Results

No	Respondent	Percentage Practicality	Category
1	Teacher	86,67%	Very Practical
2	Students	84,72%	Very Practical

Based on the results of the practicality test, the percentage of practicality of the module by the teacher is 86.67% in the very practical category and by students with an average percentage of 84.72% in the very practical category. Improvements and suggestions given are additions to the material filled in for making electrical circuit figures.

3.3. Effectiveness Analysis

Analysis of the effectiveness of the module is carried out after the module is declared valid and practical. Respondents in the effectiveness stage were students of class XII TITL at SMKS Islam Hang Tuah Batam, totaling 24. The module effectiveness stage was carried out by giving students a module evaluation test on Basic Competence 3.11. Students are said to be complete when they reach the specified KKM, which is getting a score of 65. The recapitulation of the results of the student evaluation tests can be seen in Table 5.

Table 5. Module Evaluation Results

No	Respondent	Percentage	Category
1	20	83,33%	Complete
2	4	16,67%	Not Complete
	Grade Average	73,63	Complete

Based on the results of the effectiveness analysis, the average value of the class is 73.63 which is above the KKM. Table 5 also shows that the number of students who scored 65 are 20 students, while those who scored <65 are 4 students. So, referring to the effective criteria based on classical completeness, which is at least 75%, the module can be said to be effective with the percentage of students' completeness reaching 83.33%.

3.4. Product Review
The resulting product is an Edutainment Learning Module using Microsoft Sway for the Class XII TITL Electrical Power Installation subject. The module is expected to be used as the main teaching material in the class XII TITL Electrical Installation learning at the SMKS Islam Hang Tuah Batam. It is intended that the use of modules as teaching materials can be practical so that students can also learn independently. The modules compiled are sourced from learning materials that were previously used, but are not practical and are no longer relevant for distance learning as it is today. The module is displayed via a Linktree which contains a link to the Sway with a view as shown in Figure 6.

Figure 6. Module View on Linktree and Sway

4. Conclusion

The research is conducted in purpose to create an edutainment learning module using Microsoft Sway in the subject of Electrical Power Installation Class XII TITL at SMKS Islam Hang Tuah with 24 students. Data analysis is carried out by testing the validity, practicality, and effectiveness of KD 3.11. The validity test was carried out by 3 validators, the practicality test was carried out by subject teachers and students, and the effectiveness was seen by the evaluation results after learning with the edutainment module.

The validity test was carried out by giving validity sheets to 3 validators, namely 2 lecturers in the Department of Electrical Engineering FT-UNP and 1 subject teacher, with the results of the module validity being 87.2% with a very valid category. The practicality test was carried out by giving a validity sheet to subject teachers with a module practicality result of 86.67% in the very practical category and to students with a module practicality result of 84.72% in a very practical category. The module effectiveness test is carried out by giving a module evaluation test to students which is displayed in Microsoft Form, with the results of classical completeness of students reaching 83.33% or 20 students who completed from 24 students. So it can be concluded that the module is valid, practical, and effectively used for learning Electrical Power Installation in Class XII TITL Islamic Vocational School Hang Tuah Batam.

Based on the conclusions and research that has been done, the following suggestions can be given: (1) The developed edutainment module with Microsoft Sway is expected to be an example or guide for the development of similar teaching materials but with different themes or subthemes; (2) Students are expected to improve their learning outcomes by sourced from the edutainment module with Microsoft Sway that has been developed; (3) Teachers are expected to develop teaching materials that are adapted to the syllabus and curriculum used in edutainment-based schools and according to school learning; (4) Schools are expected to facilitate and support the distance learning process by using Microsoft Sway as a medium for developing effective teaching materials for students.

REFERENCES

[1] Hendri Masdi, "Pengembangan Media Pembelajaran Interaktif Mata Pelajaran Fotografi Kompetensi Keahlian Multimedia," Konvensi Nasional Pendidikan Indonesia (KONASPI VIII). Jakarta, 2016.

[2] Winataputra, U. S., Delfi, R., Pannen, P. and Mustafa, D., "Teori Belajar dan Pembelajaran," *Hakikat Belajar dan Pembelajaran*, Pustaka: UT, 2014, 36.

[3] Setiyaningsih, *Pengembangan Modul Berbasis Edutainment Pada Pokok Bahasan Bangun Datar*. Lampung: UIN Raden Intan Lampung, 2019.

[4] Abi Fadila, "Perbandingan Hasil Belajar Matematika Antara Penggunaan Media Berbasis Komputer Dan Cetak," *JURNAL E-DuMath*, vol. 2, no. 1, pp. 59-65, 2016.

[5] M. Si Suratsih, *Pengembangan Modul Pembelajaran Biologi Berbasis Potensi Lokal Dalam Kerangka Implementasi Ktsp Sma Di Yogyakarta*. Yogyakarta: UNY, 2010.

[6] Admin, "Edutainment – New World Encyclopedia," *Newworldencyclopedia.org*, 2017. [Online]. Available: https://www.newworldencyclopedia.org/entry/Edutainment. [Accessed: September 13, 2021]

[7] Lina Widiastuti, "Pengembangan Media Pembelajaran Berbasis Sway Pada Mata Pelajaran TIK," *Jurnal Teknodik*, no. 1, pp. 163-174.

[8] Sway, "Create and share interactive reports, presentations, personal stories, and more", *Office.com*, 2017. [Online]. Available: https://sway.office.com/my. [Accessed: September 13, 2021]

[9] Create in Sway," *Microsoft.com*, 2021. [Online]. Available: https://support.microsoft.com/en-us/office/create-in-sway-db30c63b-6548-456d-b0e2-9fcd68bfa7a0?ui=en-us&rs=en-us&ad=us. [Accessed: September 13, 2021]

[10] Moh Yusuf and Hernik Pujiastutik, "Peningkatan Hasil Belajar Biologi Menggunakan Model PBL (Problem Based Learning) dengan Media Lingkungan," in *Proceeding Biology Education Conference: Biology, Science, Environmental, and Learning*., pp. 490-493, 2017.

[11] Siti Albaniah, "Modul," *Pengembangan Modul Pembelajaran Teknik Listrik Kelas X Semester Gasal Program Keahlian Teknik Elektronika Industri SMKN 2 Pengasih Kulonprogo*. Yogyakarta: Lumbung Pustaka UNY, 2018, 8-33.

[12] Dwi Rahdiyanta, *Teknik Penyusunan Modul*. Yogyakarta: UNY, 2016.

[13] Nurma Yunita Indriyanti and Susilowati, E., *Pengembangan modul*. Surakarta: Tim Pengabdian Kepada Masyarakat LPPM UNS, 2010.

[14] Sugiyono, *Metode Penelitian dan Pengembangan (Research and Development)*. Bandung: Alfabeta, 2017.

[15] I Made Tegeh and I Made Kirna, "Pengembangan Bahan ajar metode penelitian pendidikan dengan addie model," Jurnal Ika, no. 11, pp. 14, 2013.

[16] Munawaroh, "Konsep dan Pentingnya Penelitian dan Pengembangan," Urgensi Penelitian dan Pengembangan. Yogyakarta: Studi Ilmiah UKM Penelitian, 2015, 1.

[17] Siti Albaniah, "Modul," Pengembangan Modul Pembelajaran Teknik Listrik Kelas X Semester Gasal Program Keahlian Teknik Elektronika Industri SMKN 2 Pengasih Kulonprogo. Yogyakarta: Lumbung Pustaka UNY, 2018, 38.

[18] Putri Ananda, "Analisis Kepraktisan Jobsheet," Pengembangan Jobsheet Pembelajaran Pada Mata Pelajaran Sistem Pengendali Elektromagnetik Siswa Kelas XI TITL di SMK Negeri 1 Pariaman. Padang: UNP, 2017, 185.

[19] Hendri Masdi and I Gede Yusartika, "Interactive Instructional Media of Photography: Multimedia Skills Competency," The 1st International Conference on Engineering and Environment (1st ICEEE 2018) FT-UNP, pp. 601-054-1, 2018.

[20] Hendri Masdi, I Gede Yusartika, and Nurie S. Athifa, "Development of Interactive Instructional Media of Photography: Multimedia Skills Competency," 5th UPI International Conference on Technical and Vocational Education and Training (ICTVET), 2018.

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