Jurnal Teknologi, Kejuruan, dan Pengajarannya
Vol. 43, No. 2, September 2020: 135-139

Learning Innovation for the Implementation of Industrial Practices for Construction Engineering and Property in Vocational High School According to the Construction Service Industry Needs

Natasya Atikasari Nugraheni, R. M Sugandi, Sutrisno
Universitas Negeri Malang, Indonesia
E-mail: natasyaatika18@gmail.com

Abstract: Field Work Practices is practical learning activities to apply, stabilize, and improve the competence of students. These students need teaching materials by utilizing of E-Module with kvisoft flipbook maker application. The development functions for innovation is essential in increasing the readiness of Field Work Practices so that students could carry out Field Work Practices following with the needs of the Construction Services Industry. The development began with the data collection stage followed by product design, design validation, product revision, testing the product, and finishing the product. The results of material expert validation for learning design aspects was 92.19%, 87.5% for learning elements, and learning strategy aspects was 84.38%. The score of media experts for software engineering aspects was 89.58%, and visual communication aspects were 87.5%. The average response score of respondents for elements of the use of teaching materials were 86.04%, parts of the usefulness of teaching materials were 85.94%, and the conformity aspects of teaching materials 84.18%. Overall, the e-module teaching materials for Field Work Practices were good, exciting and very feasible to use as learning teaching materials. Besides, it can improve students' readiness in preparing Field Work Practices

Keywords: teaching materials, fieldwork practices, e-module

INTRODUCTION

One conception of vocational education is Field Work Practice. Field Work Practice according to the Directorate of Vocational High School Development (2017) is a practical learning activity to implement, strengthen, and improve the competence of students. Educational institutions introduce and initiate the use of information and communication technology as the basis of the latest learning and enable the learning process using internet media. The source of online learning enables the learning process to achieve the results of "complex skills" needed in the global era while at the same time enabling student centered learning (Mills, 2006: 3).

The research conducted by Tania and Susilo (2013) with the title Development of E-Module Teaching Materials as Supporting Learning Curriculum 2013 in the Paragraph Material of Service Company Adjustment Journal of Class X Accounting of Vocational High School Negeri 1 Surabaya explained that to know the development process, the feasibility of teaching materials, and students 'response to E-Module teaching materials, online learning based source learning can support students' ability to gather information sources as learning material. But existing teaching materials have not utilized existing technology, such as e-modules using the kvisoft flipbook maker application.

This can be seen from the results of research conducted by Hidayatullah and Rakhmawati (2016) entitled "Development of Flipbook Maker-Based Learning Media in Basic Electronics Subjects at Sampang State Vocational High School" that motivation in the learning process is still lacking, so that the development of learning media These students are more active when learning takes place. The importance of this development research serves to increase the readiness of Field Work Practices so that students can carry out Field Work Practices in accordance with the needs of industries. Besides teaching materials with E-Module based for students Field Work Practices is one component that is very influential in facilitating the teaching and learning process to channel sources of communication and information remotely and independently for students who carry out Field Work Practices.

METHODS

Research and development (R&D) were carried out using research methods and development Sugiyono (2009: 298) which has been modified becomes simpler. The steps method include: (1) Data collection, (2) Product design, (3) Product validation, (4) Product revision, (5) Product Testing, (6) Finished Products. The research and development subject involves: (1) media expert validator, (2) material validation validator, (3) students. The data to be obtained are quantitative. According to Riduwan (2012: 29) the formula used is: $V \frac{\Sigma X1}{\Sigma X0} X\ 100\%$

V = Level of Validity
∑X1 = Total Score answers from the validator
∑X0 = Total Hope Score

The meaning of the questionnaire validity is presented in Table 1. as follows:

Table 1. Meaning of the Number of Validity of Teaching Materials

No	Level of Validity	Validity Criteria	Information
1	85,01% – 100%	Very Valid	Not Revised
2	70,01% – 85,00%	Valid enough	Can be used but needs to be revised
3	50,01% – 70,00%	Less Valid	It is recommended not to use because it needs to be revised
4	01,00% – 50,00%	Invalid	Cannot be used

Source: Sugiyono (2009)

RESULTS

Material for E-Module Teaching Materials

Based on the observations made, the results of the observation table are summarized in table 2 as follows:

Table 2. Results of Material Observation

NO	Industrial needs	Percentage %
1	Cad Material (AutoCAD)	37,7
2	RAB material (Building Cost Estimation)	35,8
3	IUT Material (Land Measurement)	11,3
4	IBB Material (Building Materials Science)	9,4
5	Structure Material	5,7
Percentage Total		**100**

Based on table 2 the highest results of the observations made were on AutoCAD material with a percentage of 37.7%. The second highest was the RAB material with a percentage of 35.8%.

Results of Validation

Material Experts

The results of the material validation questionnaire are shown in Table 3. As follows.

Table 3. Results of Material Validation (Quantitative Data)

Assessment Aspect	Validator Score	Ideal score	Percentage %	Value Description
Aspects of Learning Design				
CAD Learning Materials	30	32	93,75	Very Valid
RAB Learning Materials	29	32	90,63	Very Valid
Total	**59**	**64**	**92,19**	**Very Valid**
Learning Aspects				
CAD Learning Materials	24	28	85,71	Very Valid
RAB Learning Materials	25	28	89,29	Very Valid
Total	**49**	**56**	**87,50**	**Very Valid**
Learning Strategy Aspects				
CAD Learning Materials	13	16	81,25	Valid enough
RAB Learning Materials	14	16	87,50	Very Valid
Total	**27**	**32**	**84,38**	**Valid enough**

In Table 3, the percentage of material expert scores for aspects of learning design was 92.19%; the learning aspect is 87.50%. And the learning strategy aspect is 84.38%.

Media Experts

The results of the media validation questionnaire are shown in table 4. as follows.

Table 4. Media validation results (Quantitative Data)

Assessment Aspect	Validator Score	Ideal score	Percentage %	Value Description
Software Engineering Aspects				
CAD Learning Materials	22	24	91,67	Very Valid
RAB Learning Materials	21	24	87,5	Very Valid
Total	**43**	**48**	**89,58**	**Very Valid**
Visual Communication Aspects				
CAD Learning Materials	25	28	89,29	Very Valid
RAB Learning Materials	24	28	85,71	Very Valid
Total	**49**	**56**	**87,50**	**Very Valid**

In Table 4 the percentage of media expert scores for the aspect of software engineering was 89.58%. And the visual communication aspect was 87.50%.

Data of Student Respondents on Product Use

For the results of product trial data in the form of quantitative data such as table 5 below.

Table 5. Data of Group Respondents

Assessment Aspect	Validator Score	Ideal score	Percentage %	Value Description
Use of teaching materials				
CAD Learning Materials	27,9	32	87,19	Very Worthy
RAB Learning Materials	27,2	32	85	Fair enough
Total	**55,1**	**64**	**86,09**	**Very Worthy**
The Effectiveness of Teaching Materials				
CAD Learning Materials	17,3	20	86,5	Very Worthy
RAB Learning Materials	16,9	20	84,5	Fair enough
Total	**34,2**	**40**	**85,50**	**Very Worthy**
Suitability of Teaching Materials				
CAD Learning Materials	6,8	8	85	Fair enough
RAB Learning Materials	6,6	8	82,5	Fair enough
Total	**13,4**	**16**	**83,75**	**Fair enough**

In Table 5, the percentage of respondent scores for teaching materials in the group trials with an average of 86.09%, for aspects of benefit teaching material is 85.50%. And for the conformity aspects of teaching materials is 83.75%.

Students' Perceptions of E – Modules

In use, in table 6 as follows:

Table 6. Data Results

Gender	Students	Able to improve	Can't improve	Amount of Value	Percentage
Man	25	25	0	2057,78	79,38
Women	7	7	0	534,44	20,61
Total	**32**	**32**	**0**	**2592,22**	**100**

Based on the results of calculations in table 8, the e-module teaching material is 79.38% of male students and 20.61% for women able to improve Field Work Practices readiness. So it can be concluded that 100% of students think that the use of e-module teaching materials can improve the readiness of Field Work Practices.

DISCUSSION

Material for E-Module Teaching Materials

Based on table 2 the highest results of the observations made were on AutoCAD material with a percentage of 37.7%. The second highest was the RAB material with a percentage of 35.8%. And the lowest results from observations are structural material with a percentage of 5.7%. From the results of the observation, an e-module teaching material product was developed with the two highest presentation materials. The e-module teaching materials developed in the form of Kvisoft Flipbook Maker soft files have three learning activities.

Research conducted by Alomari (2009) shows that online learning source-based learning can support students' ability to gather information sources as learning material. With this, it is generally indicated that the e-module development shows success proven by the help of students in terms of obtaining learning resources. So, learning activities require the development of module teaching materials that utilize online features.

Results of Validation

Based on Table 3 the calculated results obtained a percentage for aspects of learning design by 92.19%, for the learning aspects of 87.50% and for the learning strategy aspect of 84.38%. Based on the calculated results in table 4 the percentage of media expert scores for the aspect of software engineering was 89.58%, and the visual communication aspect was 87.50%. Based on the calculated results in table 5 obtained the percentage of respondents' scores for teaching materials in group trials with the average for teaching material use aspects of 86.09%, for aspects the usefulness of teaching materials is 85.50% and for the conformity aspects of teaching materials is 83.75%.

Wibowo, (2018) with the title "Development of e – module teaching materials using the flipbook maker philosophy application". That the conclusions obtained from this research and development are e-module teaching materials using the resulting kvisoft flipbook maker application that has been developed with the Borg and Gall model modified by Sugiyono which includes potential stages and problems, data collection, product design, design validation, design revisions, product trials, and product revisions. At the product validation stage conducted by material experts and linguists obtained an average value with good criteria, while for media experts obtained an average value with very good criteria.

Students' Perceptions of E-Modules

Based on table 6, the e-module teaching material is 79.38% of male students able to improve Field Work Practices readiness and 20.61% for women able to improve Field Work Practices readiness. So it can be concluded that 100% of students think that the use of e – module teaching materials can improve the readiness of Field Work Practices.

CONCLUSION

Product e-module teaching materials for Field Work Practices students from the development are expected to contribute to the world of education, especially in learning activities wherever and whenever. The use of products in the process of learning activities is suggested to pay attention to improvements suggested by expert validators so that the learning process can be more effective and efficient.

REFERENCES

Alomari, A. (2009). Investigating Online Learning Environments in a Web – Based Math Course in Jordan. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 5(3), 19-36.

Direktorat Pembinaan Sekolah Menengah Kejuruan. (2017). *Pedoman Teknis Pelaksanaan PKL pada SMK*. Jakarta: Departemen Pendidikan dan Kebudayaan.

Hidayatullah, M. S., & Rakhmawati, L. (2016). Pengembangan Media Pembelajaran Berbasis Flipbook Maker Pada Mata Pelajaran Elektronika Dasar Di SMKN 1 Sampang. Jurnal Pendidikan Teknik Elektro, 5(1), 83-88.

Mills, C.S. (2006). *Using the Internet for Active Teaching and Learning*. Ohio: Pearson Merrill Prentice Hall.

Riduwan, & Akdon. (2012). *Rumus dan Data dalam Analisis Statistika*. Bandung: Alfabeta.

Sugiyono. (2009). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R&D)*. Bandung: Alfabeta

Tania, L., & Susilowibowo, J. (2017). Pengembangan Bahan Ajar E-Modul sebagai Pendukung Pembelajaran Kurikulum 2013 Pada Materi Ayat Jurnal Penyesuaian Perusahaan Jasa Siswa Kelas X Akutansi SMK Negeri 1 Surabaya. *Jurnal Pendidikan dan Akutansi, 5*(2), 1-9.

Wibowo, E. (2018). *Pengembangan Bahan Ajar E-Module dengan Menggunakan Aplikasi Kvisoft Flipbook Maker.* Skripsi diterbitkan, Fakultas Tarbiyah dan Keguruan, Universitas Negeri Islam Lampung.