

Development of Blended Learning Radio and Television System Engineering on Audio-Video Engineering Expertise Competence

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Abstract

The explanation of the National Education System Law Number 20 concerning the National Education System (2003) states that vocational education is secondary education that prepares students to work in specific fields. This study aims to compile test the feasibility, validity, and effectiveness of the Blended Learning model in Radio and Television System Implementation (PSRT) in the competence of Audio-Video Engineering expertise at Public Vocational High School 3 Semarang. Research and development use the analysis, design, development, implementation, evaluation (ADDIE) model. This research aims to describe in detail the stages of planning, implementation, and effectiveness of the blended learning model. It shows that learning using the flipped classroom blended learning model can improve student outcomes. In general, learning activities have been carried out correctly and optimally. This can be seen from the results of the average implementation of meeting 1 = 83 (good category), meeting 2 = 85 (good category), meeting 3 = 88 (very good category), and meeting 4 = 90 (very good category). The average is 86.5, with a good category if taken based on the results above. An average of 86.5 shows that the implementation of learning with the blended learning flipped classroom model in the PSRT class XI subject of Audio Video Engineering Competence at Public Vocational High School 3 Semarang has been successfully implemented. The assessment of critical aspects of the blended learning model by learning model experts shows that learning planning with the blended learning model is feasible and can be used to implement PSRT learning activities in class XI of audio-video engineering competence because it has met the criteria for implementing blended learning by covering 5 (five) keys to blended learning, namely live events, self-paced learning, collaboration, assessment, and performance support materials. Learning with the blended learning model is declared to be effective and well implemented, as can be seen from the results of increasing student learning outcomes. Learning with the blended learning model has proven to be effective in terms of learning outcomes of the PSRT that uses the blended learning model >75. There is a significant difference in learning outcomes between the group using the blended learning model and the group not using the blended learning model. The process of increasing student activity and motivation becomes better.

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INTRODUCTION

Vocational High School is one of the formal educational institutions responsible for producing human resources with competencies, skills, and expertise to develop performance in the world of work. The Law on the National Education System Number 20 concerning the National Education System (2003) states that vocational education is secondary education that prepares students to work in specific fields.

Improving the quality of education is inseparable from the learning process. The learning process is an important activity in education. The learning process is essentially a communication process for various activities, one of which is the delivery of subject matter. Updates are made to improve the quality of education, starting with the learning process.

Vocational High School is a formal educational institution of a vocational nature with the output of vocational competence graduates. Vocational High School graduates are expected to work more independently than Senior High School graduates. However, many educators have not demonstrated competence in the teaching and learning process, so many students do not get an increased competence.

This problem also occurs in Public Vocational High School 3 Semarang, the low enthusiasm of students to learn. Many students feel bored and not enthusiastic about participating in the learning process. This is marked by a lack of interest in learning by students. If students' enthusiasm for learning decreases, it will result in a reduction in learning achievement.

Radio and Television Systems Engineering subject is low. The results of initial observations and interviews in February 2019 with the chairman of the audio-video technical expertise competence of Public Vocational High School 3 Semarang, data obtained that the average value of the learning achievement results of class XI students. The value of productive subjects, students below the Minimum Completeness Criteria (KKM) is 70, and the average learning achievement of class XI

students is 66.94. There is still one student who dropped out in class XI of the audio-video technical skill competency in this skill competency. According to Castle and McGuire (Syarif, 2012), e-learning can improve the learning experience because students can learn anywhere and under any conditions as long as they are connected to the internet without taking face-to-face learning. For this reason, a learning model is needed to combine (blend) conventional learning and e-learning in connection with the number of students experiencing problems regarding the limitations of face-to-face or traditional education. One of the possible learning alternatives for that is blended learning.

Cheung and Hew (2011) describe blended learning as a combination of face-to-face and online learning. In line with the definition above. Elenena Mosa (2006) (in Cepi Riyana, 2009) said that there are two main elements in blended learning: classroom and online learning. According to Rovai and Jordan (Sa'ud, Udin Saefudin, 2008) blended learning model is a combination of the advantages of learning that is carried out face to face (face to face learning) and virtually (e-learning). In blended learning, online learning or e-learning is a natural extension of traditional classroom learning that uses a face-to-face learning model. Through the blended learning model, the learning process will be more effective because the conventional teaching and learning process will be assisted by e-learning learning using information technology infrastructure and can be done anytime and anywhere. Blended learning not only reduces the distance that has existed between students and teachers but also increases the interaction between the two parties. Meanwhile, Dian Wahyuningsih (2013) defines blended learning as constructive. Blended learning by constructive approach (BLCA) consists of two terms, namely blended learning (mixed learning) and constructive approach (constructive approach).

Galvin (2011) suggests that blended learning is an effective way to teach and prove the success of a fact-based approach to the implementation of learning. Husamah (2015) states that blended learning combines various

suitable learning media to create special learning activities. Dwiyo (2018) suggests that blended learning (PPBL) based learning is learning that combines multiple learning delivery strategies, namely face-to-face learning, computer-based learning (offline), and e-learning (online).

With the implementation of blended learning, learning takes place more meaningfully because of the diversity of learning resources obtained. Meanwhile, Driscoll mentions four concepts regarding blended learning (1) blended learning is learning to combine or combine various web-based technologies to achieve educational goals, (2) blended learning combines various learning approaches (behaviorism, constructivism, cognitivism) to produce an optimal learning achievement with or without learning technology, (3) blended learning combines many learning technology formats, such as videotapes, CD-ROMs, web-based training, and films, with face-to-face learning, (4) blended learning combines learning technology with actual work assignments to positively impact learning and assignments.

Simply put, blended learning combines face-to-face learning (conventional learning with lecture, assignment, question and answer, demonstration methods) with online learning that utilizes a variety of media and technology to support independent learning and enable participants to become more active and provide learning experiences students.

METHODS

This research is a research and development. Putra (2012) defines research and development as a research method intentionally, systematically, aiming to find, formulate, improve, develop, produce, test the effectiveness of products, models, techniques/strategies, services, specific procedures that are superior, new, effective, efficient, productive, and meaningful. This study uses the research and development method with the Analysis, Design, Development, Implementation, Evaluation model (ADDIE). According to Setyosari (2010), development research is used to develop and

validate educational products. Thus, the outcome of this research is Blended learning on the competence of audio-video engineering skills at Public Vocational High School 3 Semarang. The research design is divided into three parts, namely research design planning, implementation, and effectiveness of the blended learning model.

RESULTS AND DISCUSSION

The study results describe in detail the stages of planning, implementation, and effectiveness of the blended learning model.

The learning planning design in this study uses a blended learning model with a constructive approach. The learning planning includes the preparation of the syllabus and the lesson plan (RPP), which is prepared by taking into account the components of the learning device, the components, and characteristics of the blended learning model, as well as the key to the blended learning model. The learning implementation plan (RPP) with the blended learning model for four meetings follows (a) subject identity, consisting of the name of the school, subject, class/semester, time allocation, and meeting 1-4, (b) basic competence identifying analog television block diagrams, (c) basic competence analyzing television receiver circuit, (d) basic competence in identifying color signals, (e) basic competence in identifying switched mode Power supply (SMPS).

The qualitative description of each learning step at meeting 1 and meeting 2, both the experimental and control groups with the conventional model, in Table 2 dan Table 3.

Based on the data collection results through the pretest, the average daily test score 1 in the control group was 76.18; the lowest value was 70 with a standard deviation of 5.125, and the highest value was 85. Meanwhile, in the experimental group, the average value was 76.32; the lowest value was 70, with a standard deviation of 5.158, and the highest value was 85. When displayed on the distribution list, it will look like table 4.

Table 1. The Results Expert Validation of Learning Subject

Variable	Sub variable	Maximum score	Score obtained	Percentage (%)	Description
Basic considerations for choosing a blended learning model	goals to be achieved, subject lesson, student point of view, effectiveness and efficiency	50	47	94	excellent
Learning system components	Purpose content/subject method media evaluation	50	47	94	excellent

Table 2. Comparison of Learning Implementation with Blended Learning Model and Conventional Model Meeting 1

Aspect	Blended learning models	Conventional model
Orientation	90	83
Organization	85	80
Investigation	72.5	55
Presentation	80	80
Analysis and evaluation	87	80
Average	83	75

Table 3. Comparison of Learning Implementation with Blended Learning Model and Conventional Model Meeting 2

Aspect	Blended learning models	Conventional model
Orientation	90	83
Organization	80	80
Investigation	80	58
Presentation	80	80
Analysis and evaluation	97	80
Average	85	76

Table 4. Distribution of Controls and Experiments

Value Range	Category	Control		Experiment	
		F	%	F	%
85-100	excellent	5	13.158	5	13.158
82-84	very good	0	0	0	0
79-81	good	10	26.316	11	28.947
76-78	fair	0	0	0	0
73-75	poor	12	31.579	11	28.947
70-72	very poor	11	28.947	11	28.947
Total		38	100	38	100

The results of the F-test on table 5. The average pre-test value in the experimental group had good initial conditions (76.32%), while the control group also had the same initial conditions, namely good (76.18%). Thus, it can be seen that the two groups in this initial condition have relatively the same ability and are in a good category.

Table 6 shows that $t_{\text{value}} = 1.930$ and $t_{\text{table}} = 1.47$ with sig. = 0.05. So that reads the value of group learning outcomes using the blended learning model > 75 is accepted. The value of learning outcomes with the blended learning model is higher than the minimum completeness criteria (KKM).

Table 5. F-test Results from Post-test 1 and Post-test 2

Post-test	F _{value}	F _{table}	F test result
1 and 2	1.095	1.77	F _{value} < F _{table} , H ₀ is accepted, which means homogeneous variance

Table 6. Hypothesis Test Results from the Average Post-Test U₁ and Post-Test U₂

Post-test	t _{value}	t _{table}	Sig.	Similarity test results
1 and 2	1.930	1.47	0.05	t _{value} > t _{table} , H ₁ is accepts, which means the value of group learning outcomes using the blended learning model is > 75.

The implementation of learning activities with the blended learning model is carried out in 4 meetings. This can be seen from the average implementation results: meeting 1 reaching 83 with good categories, meeting 2 reaching 85 (good categories), meeting 3 reaching 88 (very good categories), and meeting 4 reaching 90 (very good categories). In general, learning activities have been carried out correctly and optimally.

Based on the results above, from an average of 86.5 (good category), the implementation of learning with the blended learning model in the application of radio and television systems (PSRT) class XI audio-video techniques at Public Vocational High School 3 Semarang is exemplary. The implementation of learning follows the theory of blended learning model from Uwes A. Chaeruman (2011), which combines synchronous and asynchronous learning settings appropriately to achieve learning objectives, the approach of Cheung and Hew (2011), which combines face to face and online learning activities; the theory of Elenana Mosa (2006) in Cepi Riyana (2009) includes two main elements of blended learning, namely classroom learning, and online learning. Regulation of the minister of national education regarding implementing the learning process includes introductory activities, core activities, and closing activities.

CONCLUSION

The design of learning planning for radio and television systems engineering with blended learning models on lesson subjects to understand

analog and digital television block diagrams, cathode ray tube (CRT), and voltage sources are appropriate to be used as guidelines in the implementation of learning. Judging from the primary considerations for selecting the blended learning model, it shows the objectives, learning materials, student point of view, effectiveness, and efficiency following radio and television systems engineering learning subject. Judging from the components of the learning system, it shows the objectives, materials, methods, media, and evaluation of the blended learning model following the discussion of radio and television systems engineering learning subject. The components of the blended learning model show that there are subject identities, core competencies, basic competencies, indicators, objectives, time allocation, methods, learning activities, assessments, and learning resources according to the components of radio and television systems engineering learning tools.

Combining face-to-face and systematic online learning can build the construction of students' ideas. The implementation of the blended learning model can be used as a supplement to face-to-face learning activities with online learning access to complete the delivery of material in a broad scope with theoretical and practical competencies. Learning with the blended learning model has proven to be effective in terms of radio and television systems engineering learning outcomes using the blended learning model >75. There is a significant difference in learning outcomes between the group using the blended learning model and the group not using the blended learning model, increasing student activity and

motivation is better. The blended learning model can be implemented according to the lesson plan, including orientation, organization, investigation, presentation, analysis, evaluation, and combining synchronous and asynchronous learning settings. The blended learning model's implementation follows the proportion of content delivered online in the blended/hybrid class type with a combination of face-to-face and online learning in the range of 30-79%..

REFERENCES

- Cheung, W.S dan Khe Foon Hew. (2011). Design and Evaluation of Two Blended Learning Approaches: Lesson Learned. *Australasian Journal of Educational Technology*. No. 8. Volume 27. pp.1319-1337.
- Depdiknas. (2003). Undang-undang RI No.20 tahun 2003. tentang sistem pendidikan nasional
- Husamah. (2015). Blended project based learning: Metacognitive awareness of Biology education new students. *Journal of Education and Learning*, 9(4), 274-281.
- Syarif, Izuddin. 2012. Pengaruh Model Blended Learning terhadap Motivasi dan Prestasi Belajar Siswa SMK. *Jurnal Pendidikan Vokasi*. Nomor 2. Volume 2. pp234-249.
- Puspitasari, B. D. (2015). Pengembangan *E-Learning* Pada Mata Pelajaran Simulasi Digital Paket Keahlian Teknik Mekatronika di SMK. *Thesis*. Yogyakarta: Universitas Negeri Yogyakarta
- Putra N. (2012). *Research & Development (Penelitian dan Pengembangan: Suatu Pengantar)*. Jakarta: PT. Raja Grafindo Persada.
- Riyana, Cepi. (2009). *Teknologi Informasi dan Komunikasi dalam Pembelajaran Pedoman Bagi Guru*. <http://kurtek.upi.edu/tik/content/blended.pdf>
- Setyosari, P. (2010). *Metode Penelitian Pendidikan dan Pengembangan*. Jakarta: Prenada Media Group
- Wasis Dwiwoga (2018). Developing a Blended Learning-Based Method for Problem-Solving in Capability Learning. Malang: Januari 2018 *TOJET: The Turkish Online Journal of Educational Technology* – January 2018, volume 17 issue 1.