Development of Blended Learning Model Based on Nine Instructional Event to Increase Learning Expectations Concepts and Procedures

by Sudarman Sudarman

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Sudarman, Sugeng

Mulawarman University, Indonesia, Samarinda, Indonesia.

Keywords: Blended Learning Model, Nine Instructional Events.

Abstract: Learning strategies have changed the learning approach that can be done anywhere, anytime, with anyone, through anything. Research development of blended learning model based on instructional nine events as an alternative. The research instrument is used to measure the validity of models, media, and media appeal. Qualitative descriptive statistics are used to describe the product; descriptive quantitative to describe the feasibility of learning tools, instructional materials, interactive media, and pages. The results of the analysis of student learning characteristics include learning styles on aspects of modalities (using learning style analysis), and cognitive style (using learning style analysis developed by Kolb). The result of Visual, Audrey, Kinaesthetic learning style validity test shows that there are 28 out of 30 instruments categorized valid). The result of learning style reliability test showed the coefficient of Alpha reliability with the medium category. The result of this research is related to the development of learning tools and learning resources in the form of printed products, audio visual, internet (e-learning), Content Management System and Learning Management System web (sudarmantep.com and kuliah.daremantep.id1945.com), with main components: effectiveness , efficiency, and attractiveness.

1   INTRODUCTION

Learning is a process of interaction between lecturers and students conducted by using various learning patterns. Improving the quality of learning is done by choosing, establishing, and developing optimal learning methods to achieve the desired results (Degeng, 1991). Therefore, the design of learning needs to be developed in line with the tendency of future learning, especially aspects of strategy and the content of learning. The tendency of the learning strategy changes toward learning that can be done anywhere, anytime, with anyone, through anything. Materials/content and learning results remain with regard to the ability of students to understand the concepts and procedures of science learned. The reality on the ground shows that most of the learning in universities is still done in a classical way. The lecturer should not only transfer of knowledge but also followed by transfer of skill. This weakness can be overcome along with the rapid development of technology. Thus, it is necessary to design a learning model that combines technological progress as well as improving the quality of learning by Blended Learning model (Graham, 2006; Sudarman, 2013).

The blended learning model is widely used in learning activities. (Šafranj, 2013) apply English learning procedures using information technology means; (Porter, 2014) adopted a blended learning model for secondary schools; (Tshabalala, Ndeya-Ndereya and van der Merwe, 2014) applied blended learning to develop universities. According to (Solera, R.Solera and Arayab, 2017), for different curriculum designs at every level, the main aspects of the blended learning model include micro-learning planning and didactic orientation of the teaching and learning process in the classroom. (Singera and Stoicescu, 2011) recognizes that the use of blended learning models as a tool to strengthen teaching competencies.

Learning The blended learning model is done by combining the advantage of learning through three main activities: (1) face-to-face learning, (2) interactive computer-based learning, and (3) computer-based learning through online internet (Heinze and Procter, 2006; Januszewski and Molenda, 2008); or through e-learning (Collis and Moonen, 2001; Graham, 2006), allowing access to learning objects, and the indexing of materials from learning resources (M.H. *et al.*, 2003)

Given the combination of learning mode, it will lead to more effective learning and ease of access to learning (Graham, Allen and Ure, 2003). According to (Osguthorpe and Graham, 2003), blended learning modelling strategy is used for (1) enriching learning management, (2) knowledge access, (3) social interaction, (4) personal agency, (5) cost effectiveness, and (6) ease of revision. With the implementation of this strategy will be obtained the contribution of knowledge through the exploration of content management strategies, presentation strategies and management strategies (Reigeluth, 1983; Degeng, 1989). In addition, it is also useful as a preliminary finding of a learning development function that is a research theory whose results can be used as a foothold for the development of other functions, such as the production function of learning resources (Association for Educational Communications and Technology (AECT), 1979; Seels and Richey, 1994). Students have more opportunities to develop themselves and take responsibility for themselves (Hooper, 1992; Saunders and Klemming, 2003), improve their social competence, increase student confidence (Byers, 2001), improve information-digging and achievement skills (Kendall, 2001). Therefore, the focus of this research is to develop a blended learning model design based on nine instructional events to improve the acquisition of learning concepts and procedures. In general, this research aims at designing, developing, evaluating, revising, and producing nine instructional events based blended learning design based on conceptual and procedural comprehension-oriented study materials in the course of research methodology.

The definition of blended learning by experts still varies. Blended learning is an integrated combination of conventional learning approaches and online learning based on pages, media combinations and defences tools, and a combination of a number of pedagogical approaches (Alavi and Gallupe, 2003) as a combination of various pedagogical or teaching approaches, such as collaborative learning with support in conventional classrooms (Trapp, 2006) as a pedagogical approach that combines classroom effectiveness and socialization with technology to create active learning in an online advocacy environment (C. Dziuban, Hartman and Moskal, 2004) as a learning activity that combines the advantages of online learning and learning in conventional classrooms (Anderson and Krathwohl, 2001) as learning that can replace personal meetings (face-to-face) with virtual sessions (Young, 2002). (Kurtus, 2004) states that "blended learning is a mixture of the various learning strategies and delivery methods that will optimize the learning experience of the user. Classroom training sessions, Computer-Based Training (CBT) via a CD-ROM, Web-Based Training (WBT) can be combined as a way to train the learners ". Thus, blended learning is a mixture of various learning strategies and delivery methods that optimize the learning experience for its users; or seen as conventional learning enriched with the use of technology.

Based on the above definition of blended learning, (Graham, 2006) has analysed the definition and synthesized it into three categories of blended learning point of view, namely (1) learning modalities, (2) learning methods, and (3) face-to-face learning and learning with the help of a computer. First, as a combination of different modalities or delivery media, blended learning is seen as a learning program that is more than one way of delivery with the goal of optimizing learning outcomes and cost efficiency (Singh and Reed, 2001) or as a mix of various delivery media designed to complement each other (Singh, 2013). In this category, (Bersin, 2004) says "Blended learning is the combination of different training 'media' (technologies, activities, and types of events) to create an optimum training program for a specific audience)." how to combine face-to-face, online, and offline learning processes to improve the effectiveness, efficiency of learning, and make attractiveness and joyfulness more enjoyable.

Second, based on the categories of learning methods, blended learning as a combination of various pedagogic approaches (constructivism, behaviourism, cognition-vims) to achieve learning outcomes, whether or not with technology in learning (Driscoll, 2002). However, this condition contains a blurring of meaning, as it can almost be used to describe all environmental advocacy (Graham, Allen and Ure, 2003; C. D. Dziuban, Hartman and Moskal, 2004).

Third, blended learning as face-to-face learning and computer-assisted learning (Graham, Allen and Ure, 2003); as a combination of face-to-face learning with technology-based learning (Kerres and DeWitt, 2003); means mixing or a combination of learning or a blend of the ideal, harmonious, ideal, online face-to-face learning elements (Heinze and Procter, 2006). Mean, blended learning can be interpreted as conventional learning enriched by using technology.

There are six reasons for using blended learning: (1) pedagogical wealth, (2) knowledge access, (3) social interaction, (4) private institutions, (5) cost efficiency, and (6) ease of revision. (Osguthorpe and

Graham, 2003). These reasons show the benefits and challenges in the use of blended learning models.

Therefore, learning blended learning model is done by combining the advantages 4 learning through three main activities, namely (1) face-to-face learning, (2) interactive offline computer-based learning, and (3) computer-based learning via internet online or via e -learning. According to (Graham, 2006; Garrison and Vaughan, 2008), the combination model must follow the standards of technology, pedagogy, and context. (Oliver and Trigwell, 2005) provide the most commonly used blended learning dimensions, and is shown in Table 1.

Dimensions of blended learning, on the implementation of learning should be seen in the design of learning blended learning model. The design of learning, as a process to determine the best method of learning to arise changes in knowledge and skills in participants. According to (Miarso, 1987), the design of learning as a development of instructional systems, instructional design, instructional programs, instructional products, organization, or the development of faculty. (Staker and Horn, 2012) classify blended learning models that have been implemented in primary and secondary education in the United States, including (a) Rotation Models, (b) Station Rotation, (c) Rot Rotation, (d) Flipped Classroom, (e) Individual Rotation, (f) Flex Model, (g) Self-Blend Model, and (h) Enriched-Virtual Model. Every model of blended learning, has differences in learning practices, but each has its own advantages.

Table 1: Blended learning dimension.

Dimensions	Descriptions
Presentation Mode	A combination of conventional learning with page-based online learning
Technology	A combination of various media and technology devices
Pedagogy	A combination of different pedagogical approaches
Chronology	The synchronous and asynchronous approach

Implementation The blended learning model includes synchronous and asynchronous learning. A face-to-face learning strategy, referring to (Gagne, 1983) thought that includes nine events of instruction, (1) attracts attention, (2) notifies learning objectives, (3) stimulates memory, (4) presents material teaching, (5) providing learning guidance, (6) encouraging performance, (7) providing informative feedback, (8) assessing performance, and (9) increasing retention and transfer of learning. These

nine events are successive stages in a learning process in order to create a conducive condition so that the learning process runs effectively and efficiently. In general, blended learning has three characteristics. First, it is flexible in providing learning resources (Kuhn, Clark and Huang, 2000); Secondly, it provides a diversity of learning and a third, experience of e-learning experience on campus.

The acquisition of learning as an overview of students' understanding of the topics studied, and measured by the number of correct answer scores on acquisition test. This test refers to two kinds of goals, namely concepts and procedures. Many learning and development theories differentiate between conceptual and procedural knowledge (Bisanz and LeFevre, 1992). In addition, learning acquisition is influenced by various factors, both internal and external factors, and also influenced by three main factors, it is a cognitive ability, motivation, and quality of learning (Bloom, 1979). The cognitive model of the relationship between different knowledge types can facilitate a common understanding of the human mind, and help design the context of conceptual knowledge (Rittle-Johnson, Siegler and Alibali, 2001); and that knowledge is stored in some form of relational representation, such as schemes, semantic or hierarchical networks (Byrnes and Wasik, 1991); With regard to task completion, students tend to rely on conceptual knowledge to produce problem-solving methods (Briars and Siegler, 1984; Bisanz and LeFevre, 1992). According to (Anderson and Krathwohl, 2001), conceptual knowledge becomes the basis for understanding, and consists of three subtypes, namely (a) knowledge of classification and category, (b) knowledge of principles and generalizations, and (c) knowledge of theories, models and structure. Thus, the acquisition of learning includes two things, namely concepts and procedures; and influenced by internal and external factors of the learners themselves, cognitive ability, motivation and quality of learning.

Procedural knowledge is seen as operator knowledge and knowledge conditions to achieve certain goals (Byrnes and Wasik, 1991); or as knowledge of how to do things (Anderson and Krathwohl, 2001) includes knowledge of skills, algorithms, techniques, and methods as a whole known as procedures (DeJong and Ferguson-Hessler, 1996), including familiarity with representational systems of mathematical symbols and knowledge of rules and procedures for solving exercises in mathematics (Hiebert and Lefevre, 1986). With regard to the acquisition of learning, (Merrill, 2012)

reveals that the acquisition of learning basically consists of two dimensions, namely the dimensions of content and performance dimensions. Content dimensions consist of: facts, concepts, procedures, and principles. Based on the above description, procedural knowledge as operator knowledge includes a variety of skills, techniques, algorithms and others to solve the problems faced and to achieve the learning achievement as planned

2 METHODS

This research uses Research and Development (R & D) method, and its implementation follows the first seven stages of (Borg and Gall, 1989), i.e. (1) Preliminary Research and Data Collection, (2) Planning, (3) Preliminary Product Creation, 4) Initial Testing, (5) Preliminary Product Repair, (6) Field Trial, (7) Operational Product Repair. This is because, in the first year, the research aims to develop the product of learning design model, printed teaching materials, audio teaching materials, audio visual teaching materials, video teaching materials, interactive multimedia teaching materials, and teaching materials contained in WEB, packaged in the form of CD-ROM, in order to be used by students to study courses in educational research methodology.

The design of multimedia development using the development model of (Lee and Owens, 2004). This is in accordance with the needs of lectures on Educational Research Methodology in FKIP Unmul, FKIP Unikarta, FKIP Widyagama and FKIP UBT. Students from the four FKIP were taken as research samples. The multimedia development model is shown in Figure 1.

2.1 Analysis / Assessment

In the analysis phase consists of needs assessment and front-end analysis, including (1) analyzing existing conditions; (2) identify what needs to be mastered (knowledge, attitude, and skill) to complete a task; (3) formulate objectives that have been identified sequentially from the most important; (4) identifying the differences between expected conditions objectives and existing conditions, (5) determining and documenting existing advantages; (6) determine a priority in the effort to overcome the existing problems.
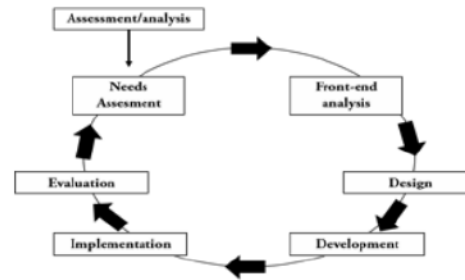

Figure 1: Lee and Owens multimedia development model.

The front-end analysis is subdivided in several steps. Student Analysis, at this stage is done the analysis of initial ability and characteristics of students. Technology Analysis, at this stage is analyzed is the availability of technology types in the learning environment. Situation analysis, this relates to the consideration of the learning environment in the delivery of the material, in order to make it possible to find effective solutions for the delivery of the material. Learning Analysis, to outline the steps in achieving the learning objectives. Problem Analysis, all data that has been collected and then discussed to see the problems that exist. Special Ability Analysis is based on the results of initial capability analysis and student characteristics, learning analysis, and the determination of capabilities and skills and sub-sub capabilities and sub-skills that are considered important. Media Analysis, as the media selection stage according to the availability of technology in the learning environment that is considered the best in delivering learning materials. Analysis of data availability, related to the availability of learning materials developed. Cost Analysis, to take into account development costs.

2.2 Designing

The design stage is divided into five steps: Create Project Schedule; Forming a Project Team; Specifying Media Specifications; Content Structure Content / Outline; and Control Configuration.

2.3 Development and Implementation

At this stage is done in 4 steps, namely: 1) making storyboard, 2) production, 3) the pilot and program reviews are conducted in three stages: editorial, functional, technical review; 4) Implementation is the stage of application of media in learning activities. 4)

Implementation is the stage of application of media in learning activities.

2.4 Evaluation

The concrete steps taken by lecturers in the Research Methodology when looking at the activities, motivation, and interest of the students are low in following the lectures: (a) Varying learning strategies, (b) Providing individual tasks to create research plans (proposal) and presented individually, (c) Present a research video whose results bring significant benefits, for example to make students more interested, (d) Provide tasks by themselves and discussed in front of the class, and (e) Provide rewards for students who already perform their duties with either as a replacement for quiz I or quiz II. In this study the steps taken are a combination of Alessi and Trollip (Luik, 2006), and nine instructional events (Gagne, 1983)and illustrated as shown in Table 2.

Table 2: Step learning model based nine instructional event.

Stages	Steps of Learning	Nine Instructional Events
1	Submission of information	Draw attention Inform the learning objectives Stimulate memory Present teaching materials
2	Student guidance	Provide tutoring
3	Practice	Encourage performance Provide informative feedback
4	Assessment of learning	Assess performance Improve retention and transfer of learning

This study involves some data regarding the development of learning tools and learning resources in the form of print, audio-visual, computer, internet (e-learning) products, in CMS and LMS website, with major variable components of effectiveness, efficiency and attractiveness. Several research instruments (questionnaires) were used to measure the validity of models, media, and media appeal, developed and developed by the research team on the basis of the variables translated into research indicators. Data analysis using qualitative descriptive statistical technique to describe the product; and quantitative descriptive statistics to describe the feasibility of learning tools, instructional materials, interactive media and the website http://

sudarmantep.com and
http://kuliah.daremantep.id1945.com.

3 RESULTS AND DISCUSSION

3.1 Development Results

This first year research is a development research that aims to produce blended learning model based on instructional event nine to the diversity of learning styles of students on lectures Research Methodology. The result of the analysis of Blended Learning Model needs to show that in the lectures of Research Methodology in the four FKIP (FKIP Unmul, FKIP Unikarta, FKIP Widyagama, and FKIP UBT) there is a diversity of learning tools, web development and interactive multimedia development.

The results of the analysis of student learning characteristics include learning styles on aspects of modalities (using VAK analysis), and cognitive style (using learning style analysis developed by KOLB). VAK Learning Style Instrument (Visual, Auditory, and Kinesthetic) in the form of a questionnaire refers to the Learning Styles Self-Assessment Questionnaire; consists of 30 items and each item consists of 3 options. Each option is in the form of a statement regarding the type of learning style of VAK. The result of VAK learning style validity test shows that there are 28 out of 30 instruments (N = 340 student respondents) categorized valid (analysis with SPSS assistance, selected item with Sig. $< \alpha$). The result of VAK learning style reliability test showed the coefficient of Alpha reliability with medium category. The result of descriptive analysis of VAK learning style data according to faculty level is shown in Figure 2.
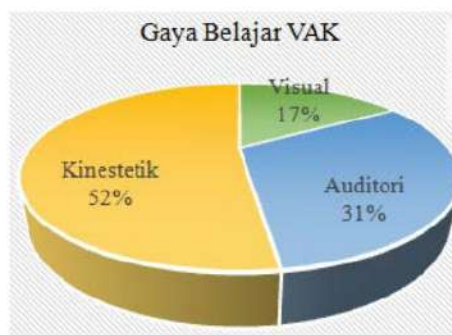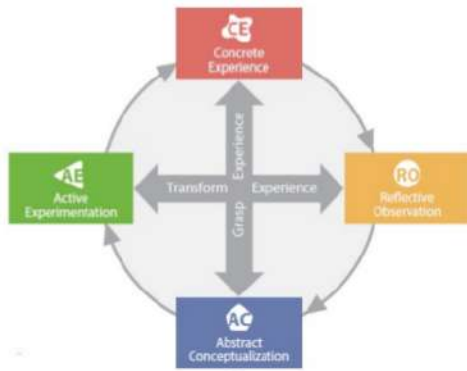

Figure 2: Learning styles of VAK by faculty level.

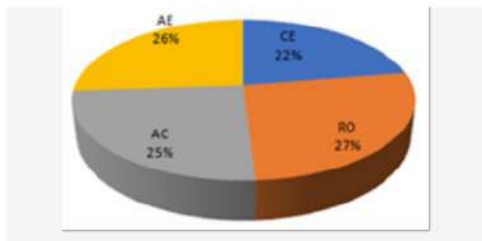Figure 3: The experimental learning cycle (Kolb, 1984).

Figure 4: Result of percentage learning style of KOLB.

The KOLB Learning style instrument in the form of a questionnaire refers to KLSI (The Kolb Learning Style Inventory) (Kolb, 1984). This instrument consists of 12 grain aspects and each grain aspect consists of 4 items of statement (as the fourth option must be answered by the respondent), so that the instrument there are 48 items. Quantification of optional scores from each item of KOLB statement are 1, 2, 3, and 4. The result of validity test of learning style KOLB (n = 48 gram; N = 424 students) indicates that the whole item of learning instrument KOLB is categorized as valid (analysis with the help of SPSS, selected item with Sig. <α). The result of KOLB style learning instrument reliability test showed the value of Alpha coefficient of reliability with medium category.

The learning styles of KOLB are classified into 4 main conditions of learning characteristics: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation, AE), and shown in Figure 3.

The result of descriptive analysis of learning style data of KOLB according to four classification of condition overall obtained the result shown in Figure 4.

The four classifications of learning style of KOLB are further categorized based on learning characteristics into four learning style characters according to clinical observation of Learning Style Inventory (LSI) score pattern (Kolb, 1984, Kolb & Kolb, 2005), ie (1) Diverging (Diverger (2) Assimilating (Assimilator, combination of RO and AC), (3) Converging (Convergence, combination of AC and AE), and (4) Accommo-dating (Accommodator, AE and CE mix). The results of the analysis show that the characteristics of each study category for the learning category Assimilator is 53%, Converge 20% and Accomodator 26%, but the diverger type is not found in the study program in FKIP.

3.2 Design of Blended Learning Model

Design of Blended Learning Model Based on Nine Instructional Event shown in Figure 5. The following is the stages in the design.

- Identify learning needs and learning achievement analysis.
- Identify the character of the student. This is related to the needs of the learning design process, namely in the form of learning motivation, learning style, study habits, learning ability, and thinking about the application of the material being studied.
- Special ability analyses as the process of learning achievement of subject matter (CPMK) become sub CPMK or special ability which is arranged logically and systematically.
- Write down special abilities. Peruvian special skills as a guide determine the level of achievement of student learning behavior (knowledge, attitude and skills).
- Learning delivery strategy, implemented using the nine instructional event stage combined with blended learning strategy
- Develop a learning resource. in the form of interactive multimedia, pages (web) and teaching materials.
- Develop a formative and summative evaluation plan
- Revision of instructional design based on formative and summative evaluation results.
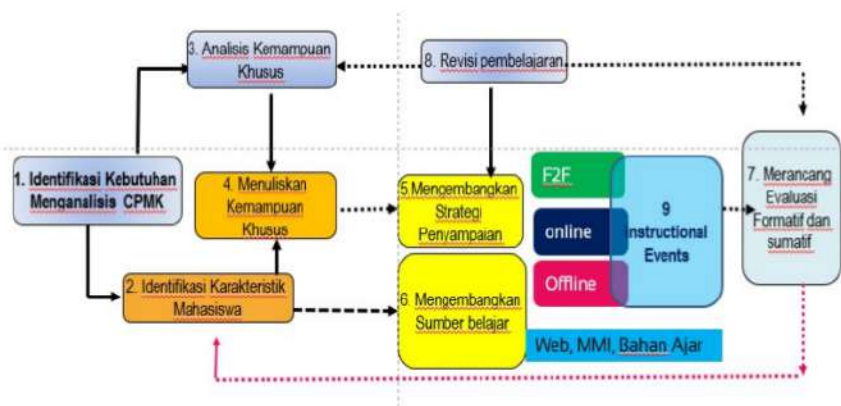- Results of Data Analysis Research

Figure 5. Blended Learning Model Design based on Nine Instructional Event

3.3 Result of Data Analysis Research

3.3.1 Expert Review of Materials

The first trial was a material review by a material expert to derive a theoretical conclusion of the product's feasibility. The material expert is a professor at FKIP Unmul, as well as having experience in teaching research methodology courses at undergraduate and postgraduate courses. Aspects validated by the material expert include: (a) Introduction, (b) Presentation of the title, (c) Material depth, (d) Student participation, and (e) Assessment / evaluation. The results of review of material experts reviewed by researchers, as a basis for revision of learning media products from the material aspects.

3.3.2 Overview of media experts

The media expert who examines the learning media product (interactive multimedia, web) is a media practitioner and one of the lecturers of computer science high school in East Kalimantan. Aspects on media validated by 2 experts include: (a) Display quality, (b) Presentation of material, (c) User interaction, and (d) Interaction in media programs. In all aspects of the media, both experts (validators) stated that the Media used in Phase 1 and Phase 2, is suitable for testing activities. The results of validation of material experts and media experts stated that the various media products produced in this study is feasible to be tested to the students through field testing.

3.3.3 Field test of student's response

Based on the data collected related to Blended Learning, it is found that aspects (a) Student interest is 87.43%; (b) desire and desire of students 88.82%; (c) Student attention 90.3%; and student satisfaction 83.45%. This condition indicates that the desire and the desire of students to apply Blended Learning in learning is the biggest, that is 88,82% although their satisfaction level only reach 83,45%.

3.3.4 Research Products Targeted

Teaching Materials Research Methodology with blended learning model based on nine instructional events. This device consists of RPS, and RPP with blended learning model based on nine instructional events. Interactive multimedia based blended learning, website for instructional http://kuliah.daremantep.id1945.com and http://sudarmantep.com

4 DISCUSSION

Today, the tendency of learning strategies has changed the traditional learning approach to today's learning so it can be done anywhere, anytime, with anyone, through anything. Material and learning outcomes regarding the ability of students to understand the concepts and procedures of the discipline studied. One alternative model of learning to overcome it is the blended learning model based on nine instructional events. In the blended learning model, learning is done by combining the advantages

learning through three main activities, namely: (1) face-to-face learning, (2) interactive offline computer-based learning, and (3) computer-based learning through online internet; and can be implemented through e-learning. However, the Combination Model must follow the standards of technology, pedagogy, and context.

The condition shows that blended learning model applying information technology progress in real so that student becomes more interested to learn. The products of this research are learning model design, printed teaching materials, audio teaching materials, audio visual teaching materials, video teaching materials, interactive multi-media teaching materials, and teaching materials contained in the WEB, packaged in CD-ROM format. used by students in study courses in educational research methodology. From these products, then the results of research that developed this learning model is very supportive for the case and completeness of students studying lecture materials Research Methodology.

The implementation of this research activity is the first year of 3 years of all research activities. Therefore the results of product development in this first phase of research will be continued in the next stage of research, so that the resulting product better and more useful for education.

5 CONCLUSIONS

Product development model of learning learning based on nine instructional events blended learning consists of four supporting components namely a) web with open source claroline platform with content technology and learning management system, and web CMS to facilitate access information for the public b) Interactive media in the form of CD tutorial for offline learning and c) Text teaching materials, d) Learning device learning model of blended learning based nine instructional events on the research methodology course.

Web learning with content technology and learning management system has several facilities in the form of: a) announcement facility, b) Document Facility, c) Assigment Facility, d) Facilities forum, e) Discussion facility, has obtained a very feasible predicate for use either by material experts , media expert and field test.

The interactive learning media as a medium of offline learning facility consists of material components in the form of pdf text, video tutorials, interactive quizzes, has earned a very worthy

predicate for use by material experts, media experts and field test.

Text materials facilitate face-to-face advocacy, each chapter of the lesson, covering (1) the title of the chapter, (2) the content framework, the learning achievement, and the learning outcome indicator, (3) the material exposure, (4) the summary, (5) the Student worksheet, and (6) the final test of the chapter.

Learning tools contain RPS, which consists of learning achievement subjects, Sub-CPMK, and the distribution of study materials for one semester. Learning tool also contains RPP with learning model of blended learning based on instructional nine event, has got very good predicate to be used either by material expert or media expert.

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