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Development of E-Learning Statistics Learning Models in UIN Sultan Maulana Hasanuddin Banten

*[1]Eko Wahyu Wibowo, [2]Suriani, [3]Jhoni Lagun Siang, [4]Jafar Dahlan

***ABSTRACT**--In general, this study aims to produce a model of statistical education learning with elearning in order to improve student understanding. This research is a Research and Development (Research and Development). Research and development are a research that is designed to develop a new product and or can complement a product that has been done with steps that can be accounted for. Educational Statistics Learning Model with e-learning at UIN Sultan Maulana Hasanuddin Banten is feasible to use. The Education Statistics learning model with e-learning at UIN Sultan Maulana Hasanuddin Banten effectively improves student learning outcomes.*

***Keywords**-- e-learning, statistics, learning model.*

I. INTRODUCTION

At the simplest level, statistics are the science of summarizing and presenting data in an accurate, reflecting and conveying meaning. At the next level statistics is testing hypotheses through a systematic process to answer important research questions (Cook, Netuveli, & Sheikh, 2004). The use of statistics today has penetrated into various fields. In developed countries like America and Japan, statistics have long been developing rapidly in line with the progress of economics and engineering. In fact, the progress of a country is determined by the extent to which the country can apply statistics in solving development problems and development planning. Today, Japan is one of the countries that is very successful in applying statistics in various fields such as car product design planning and marketing mastery strategies in various countries. Japan has successfully integrated statistics with economics, product design, psychology and sociology in various countries to predict and analyze consumer behavior so that Japan has been able to master the world economy (Cook et al., 2004).

Statistics also plays a major role in the innovation process of business and industrial development. Statistics as a method is the key to success to solve or get solutions to problems encountered in the world of business and industry, namely the achievement of performance that can compete with competitive advantage.

[1]*Departement of Education Technology Universitas Negeri Jakarta, Jl. Rawamangun Muka Jakarta Timur 13220 Indonesia and lecturer at UIN Sultan Maulana Hasanudin Banten, Indonesia, eko.wibowo@uinbanten.ac.id .

[2] Departement of Education Technology Universitas Negeri Jakarta, Jl. Rawamangun Muka Jakarta Timur 13220 Indonesia.

[3] Department of education Mathemathic Universitas Bumi hijrah Maluku utara, Jl. Lintas Halmahera Sofifi, Maluku Utara, indonesia.

[4] Department of education Mathemathic Universitas Bumi hijrah Maluku utara, Jl. Lintas Halmahera Sofifi, Maluku Utara, indonesia.

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In Indonesia, statistics have long been seen as something that is very important in designing and making development plans which are marked by the establishment of the Central Statistics Agency (BPS) by the government. BPS is a non-departmental government agency that is under and is responsible to the president. These institutions are tasked with conducting surveys in the fields of economics, agriculture and industry and conducting population censuses. The results of statistical calculations are not only used by the government, but also by academics, researchers and other parties to make a situation analysis or conduct research. In addition, this institution is also tasked with establishing cooperation with international institutions in various countries in order to enhance the development of statistics in Indonesia ("About BPS," 2014).

At the State Islamic University (UIN) Sultan Maulana Hasanuddin Banten, statistics courses are given in most majors. One of the departments that provides learning about statistics is the Department of Islamic Education (PAI).

From the results of evaluating statistical learning in 2009 PAI majors students obtained as follows: from 189 students who received an A grade of 61 people (32.28%), a B grade of 118 people (62.43%), a C grade of 7 people (3.70%) and E values of 3 people (1.59%). When viewed from the final grades obtained by students, generally shows good results. The value of students who received A and B reached 170 people (94.71%). However, this result is contrary to the ability of students to analyze the final project research data. This can be known from the experience of researchers when testing the final thesis of students. Most students who use quantitative analysis in writing their final project, they are not able to explain the acquisition of data analysis, the benefits and functions of doing these calculations. In addition, errors were still found in making conclusions based on the results of statistical data analysis on the writing of the final project.

Based on the description above, efforts are needed in order to improve the quality of learning on various sides. At least there are five main elements that need to be considered to improve the quality of learning, namely students, lecturers, materials, learning methods / processes and learning environments (Williams & Williams, 2012).

II. LITERATURE REVIEW

2.*1 Learning Model Concepts* Learning

models consist of two words, namely the model and learning. Basically, the model is a visualization or conceptual framework that is used as a guide in carrying out activities.

The term model can be interpreted as a simplification or abstract representation of a process, device or concept (Rothwell & Kazanas, 1998). While learning is an activity that seeks to teach students in an integrated manner by taking into account learning environment factors, student characteristics, characteristics of the field of study as well as various learning strategies, both delivery, management, and organizing learning.

According to Law on Higher Education No. 12/2012, Chapter I Article Verse 12 learning is the process of student interaction with lecturers and learning resources in a learning environment (Law no. 12 of 2012 on Education, 2012: 4). According to Gagne in Paul Saettler, in learning the role of teacher / lecturer is more emphasized on how to design and arrange various resources and facilities available for students to use or use in learning something (Saettler, 2004). This understanding implies that learning is a process that is deliberately planned and designed in such a way as to provide assistance for the learning process.

Learning model is a plan or a pattern that is used as a guide in planning learning in class or learning in tutorials and in determining learning tools including books, films, computers, curriculum and others. According to Joyce each learning model directs us into designing learning to help students in such a way that learning objectives are achieved (Joyce & Weil, 1986).

2.2 Development of Learning Models

Development is interpreted as a process, way, deeds to develop. Development means a process of developing from something that previously existed to be more or different according to the aims and objectives of the development process.

Model development is defined as a conceptual design engineering process in an effort to improve the function of the existing model, through the addition of learning components that are considered to be able to improve the quality of the achievement of the objectives to be achieved both process goals and outcome objectives.

Model development can also be interpreted as an effort to expand or realize potentials, bring a situation in stages to a situation that is more complete, bigger or better, advancing something from the earlier to the later or from the simple to the more complex .

Development of learning models can be interpreted as an effort or conceptual design engineering process in an effort to improve the function of existing learning models in order to achieve goals both in terms of the process and results.

According to Gustafson, there are several learning development models that can be used in designing an educational product. The design model must be adapted to the product model to be made (Branch, 2002).

2.3 The Concept of E-Learning

E-Learning is a use of internet technology in the delivery of learning in a broad range based on three criteria, namely:

1) E-learning is a network with the ability to renew, store, distribute and share teaching materials or information,

2) Delivery to the user is done through a computer using standard internet technology,

3) Focused on a broad view of learning (Rosenberg, 2001: 9).

Utilization of e-learning in learning is actually a strategic step to explore the potential that is under human since birth because it can construct knowledge through the use of various learning resources. Through e-learning learning, building a whole person becomes a very multak thing. Human wholeness can be seen from the aspects of the Ahmadiyah community that develop into skills that must be possessed in order to develop and utilize technology. At this time e-learning has developed in various ICT-based learning models such as: CBT (Computer Based Training), CBI (Computer Based Instruction), Distance Learning, Distance Education, CLE (Cybernetic Learning Environment), Desktop Video Conferencing, ILS (Integrated Learning System), LCC (Learner-Centered Classroom), Teleconferencing, WBT (Web-Based Training), and so on.

III. METHODOLOGY/MATERIALS

In general, this study aims to produce a model of statistical educationby learningelearning in order to improve student understanding. In more detail, the objectives of this study are:

1. To find out the procedures for developing a Statistics learning model by elearning at UIN Sultan Maulana Hasanuddin Banten?

2 To find out the feasibility of the results of the development of Statistics learning models by elearning at UIN Sultan Maulana Hasanuddin Banten?

3 To find out the effectiveness of Statistics learning models with elearning at UIN Sultan Maulana Hasanuddin Banten?

This research was conducted on the sixth semester students majoring in Islamic Religious Education (PAI) Faculty of Tarbiyah and Teacher Training UIN Sultan Maulana Hasanuddin Banten who took Education Statistics courses.

This research is a Research and Development (Research and Development). Research and development is a research designed to develop a new product and / or improve existing products with steps that can be accounted for.

According to (Gall et al., 2007), what is meant by research and development is "a process used develop and validate educational products". There are also those who call this"researchresearch based development", which appears as a strategy and aims to improve the quality of education. In addition to developing and validating educational outcomes, research and development also aims to discover new knowledge through 'basic research', or to answer specific questions about practical issues through 'applied research', which is used to improve educational practices.

Research Research and Development is also defined as a study that used to produce a particular product, and test the effectiveness of the product.

IV. RESULTS AND FINDINGS

4.1 Model draft 1

In the development of thismodel draft 1, obtained based on the results of the identification of needs and analysis of learning objectives. Identification of needs and analysis of learning objectives is done after analyzing the results of preliminary research that has been done before. Thismodel draft 1, was created after determining General Instructional Objectives, learning analysis, identifying student behavior or characteristics, Special Instructional Objectives, assessment tools and learning strategies. Furthermore, themodel draft 1was tested by design experts and material experts. Thismodel draft 1, in the end became a book or learning module, in which in addition to the learning material it also contained sample questions, exercises and formative tests, all of which had been validated and revised according to expert advice. Thismodel draft 1 contains a mapping that already exists in the learning objectives and is contained in the form of menus contained in e-learning the developed.

4.2 Model draft 2

a) Development of thewebsite e-learning

Model draft 2 is an explanation of the components, sub-components that constitute input to thedraft final. Thismodel draft 2 relates to the media that will be used in the learning process of Education Statistics courses with e-learning. Therefore, the post into elearning required several things:

At this stagewebsite of e-learning developed using 8 steps according to the website development (Diffily, 2006), namely: 1) planning; 2) Content / Content; 3) Design; 4) Construction; 5) Trial; 6) Hosting; 7) Publicity; and 8) Reviews;

4.3 Models draft finalof

Model draft the finalof an amalgamation ofmodels draft 1 andmodel of draft 2. Theusingprocedure e-learning is as follows:

1) Access the e-learning

Learning Education statistics by the e-learning can be executed by using the Internet Explorer browser, mozilla firefox or google chrome by typing http://www.lms.uinbanten.ac.id

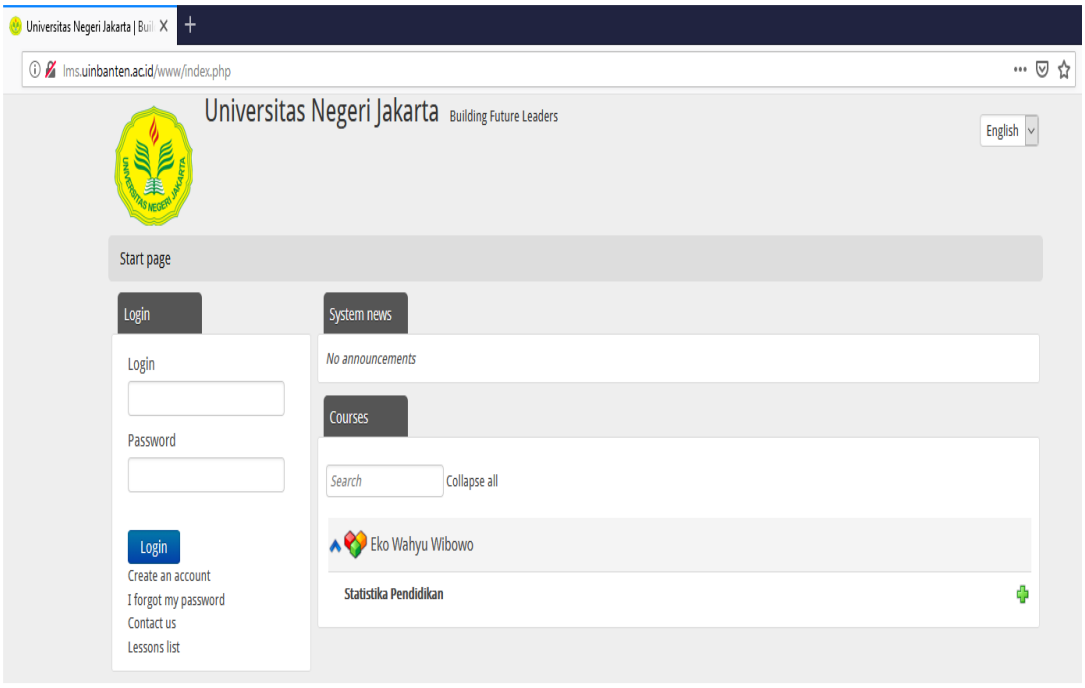

Figure 1: The initial display of e-learning

4.4 Expert Test (One to One Expert)

1) Learning Design Expert

Based on the validation of the learning design expert, overall the quality of themodels draft 1 and draft 2of Statistics learning materials with e-learning is at a level of suitability of 4.63 or 92.59. This figure is in the very good rating category. Therefore, the designs in themodels draft 1 and draft 2can be used for individual trials.

2) Material Expert The

results of the validation by the material expert as a whole against the draft of the Statistics learning material development with e-learning are included in the excellent category with an average suitability of 4.57 or 91.30 (on a scale of 100). Thus the draft development of Statistics learning materials with e-learning can be used for individual trials.

3) Media experts

Overall, instructional media experts rated this validation as very good, reaching an average of 4.61 or 92.22 (on a scale of 100). Thus the draft development of Statistics learning materials with e-learning can be used for further trials.

Of the three validations carried out by learning design experts, material experts, and media experts, it is the basis for conducting individual trials (one to one) and continued bysmall grouptests and field trials

4.5 Individual Trials (One to One Leaner)

Based on suggestions and input from learning design experts, learning material experts, and media experts, Statistics learning materials with e-learning are used for individual trials (one-to-one learners).

Individual test responses to the benefits of Statistics learning with e-learning are at 4.56 or 91.11 (on a scale of 100). This value is in the very good category. Based on these achievements it can be seen that students find it easier to learn by using e-learninglearning,materials are easy to download, learning with e-learning is quite complete (there are material, practice exercises, formative tests and answers). While in terms of technical quality, statistical learning materials with e-learning obtained a value of 4.67 or 93.33 (on a scale of 100). This value is included in the very good category. Based on these values it can be seen that statistical learning with e-learning is easy to operate, the display of learning is simple, easy and clearly read.

In terms of the implementation of statistical learning materials with e-learning, the score is 4.48 or 89.52 (on a scale of 100). This value is included in the very good category. Based on these values it can be seen that statistical learning with e-learning is easy to understand, communicative, can be accessed with various gadget devices, and motivates students to be active.

From the aspect of learning design it is found that statistical learning materials with e-learning score of 4.57 or 91.43 (on a scale of 100). This value is included in the very good category. Based on these values it can be seen that statistical learning with e-learning is interesting to use, the examples are easy to understand, the learning objectives are clear, and the material can be read clearly. From several aspects that are used as indicators in individual trials (one to one learners) it can be concluded that the product developed in the form of statistical learning materials with e-learning is feasible to use.

Development of Statistics learning models with e-learning which is tested effective in its application. This can be seen from the achievement of an average of 3 students who are evaluating. Where the 1st student scores 4.69 or 93.85 (on a scale of 100), while the 2nd student scores 4.62 or 92.31 (on a scale of 100) and the 3rd student scores 4.38 or 87.69 (on a scale of 100). The three grades obtained by these students are in the excellent category.

This illustrates that the development of Statistics learning models with e-learning is very effectively applied to students with high, medium and low abilities.

4.6 Field Trials Group(FieldTrial)

Trial group field(FieldTrial)is a step performed after the small group trial(smallgroup)are implemented. This trial was applied to 30 students with different abilities.

The conclusions from thisfield trialgroup overall obtained an average value of 4.73 or 94.51 (on a scale of 100). This value is included in the very good category. Based on the graph above, the responses of field group trials in terms ofacceptance and attractivenessin learning Statistics Education with e-learning are at a value of 4.72 or 94.4 (on a scale of 100). This value is in the very good category. Based on the achievement of these values, it can be seen that students feel easier and are interested in learning by using e-learning, learning with e-learning helps students understand learning material, learning with e-learninglearning motivatesspirit and provides a sense of comfort / closeness with lecturers.

In terms of compatibility with the environment (appropriateness) statistical learning with e-learning reached a value of 4.74 or 94.89 (on a scale of 100). This value is included in the very good category. Based on these values it can be seen that statistical learning materials with e-learning facilitate discussion with lecturers and student friends, easy to access material, according to needs, and useful.

In terms of the effectiveness of statistical learning with e-learning, the score is 4.69 or 93.73 (on a scale of 100). This value is included in the very good category. Based on these values it can be seen that statistical learning with e-learning records the progress and performance of student learning, enabling students to choose the material they want to learn and need.

From the aspect of continuity (sustainability) statistical learning with e-learning has a value of 4.73 or 94.50 (on a scale of 100). This value is included in the very good category. Based on these values it can be seen that statistical learning with e-learning can be accessed from anywhere and at any time, goes well using computers or gadgets, assessments are fair and the results are quickly known.

From the aspect of the ability to be(implementedimplementability) note that statistical learning materials with e-learning score of 4.74 or 94.75 (on a scale of 100). This value is included in the very good category. Based on these values it can be seen that statistical learning with e-learning is easy to use, easy to operate, there is a summary of each subject and its operation is stable and smooth. From several aspects that are used as indicators infield trial trials itcan be concluded that the product developed in the form of educational statistics learning materials with e-learning is appropriate to be used.

V. DISCUSSION

1. Statistics Learning During This

Time Learning Statistics courses conducted so far are still conventional. The learning that has been done does not pay attention to the nature, characteristics, and steps in applying the learning model that is relevant to the essence of the material and the condition of the student. Learning is done in the classroom with the media used in the form of a(whiteboardwhiteboard), markers, and other media such as LCD projectors whose use is still rare

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2. Results of Model Development Feasibility Model

development feasibility is based on the results of formative evaluations conducted. Formative evaluations carried out in this study were in the form of one to one experts, one to one learners, small groups and field trials.

In the formative evaluation one to one expert includes three experts namely learning design expert, material expert and media expert. Based on the validation of learning design experts, overall that the quality of Statistics learning materials with e-learning is at a level of suitability of 4.63 or 92.59 (on a scale of 100). This figure is in the very good rating category. This assessment is based on 5 indicators namely the attractiveness of e-learning (95.00), interaction of learning processes (92.50), formulation of learning objectives (95.00), e-learning as a source of learning (90.00), learning materials and theories (91.11). Whereas based on the results of the material expert validation it was found that overall the draft of Statistics learning material development with e-learning was included in the excellent category with an average suitability of 4.57 or 91.30 (on a scale of 100). This assessment is based on 3 aspects, namely aspects of Language eligibility (91.25), presentation eligibility aspects (92.00) and content eligibility aspects (90.67). For the results of the validation of the instructional media experts as a whole, the instructional media experts rated this validation as a very good category, reaching an average of 4.61 or 92.22 (on a scale of 100). This assessment is based on 4 indicators namely linguistic and term indicators (95.00), e-learning organizing indicators (92.50), e-learning interaction level indicators (90.77) and presentation or display indicators (92.73).

Based on the results of the validation of the experts, be it the learning design expert, the material expert and the media expert recommend that the material for developing Statistics learning models with e-learning developed have followed the procedures and rules of developing the learning material.

Based on individual test responses (one to one learners) obtained overall learning materials by elearning reached an average of 4.56 or 91.28 (on a scale of 100). This value is included in the very good category. The assessment is based on 4 indicators, namely: 1) learning benefit indicators. Where based on these indicators it is known that students find it easier to learn by using e-learninglearning,materials are easy to download, learning with e-learning is quite complete (there are material, practice exercises, formative tests and answers). 2) technical quality indicators of learning materials. Based on this indicator it can be seen that statistical learning with e-learning is easy to operate, the display of learning is simple, easy and clearly read. 3) indicators of the implementation of learning materials. Based on this indicator it can be seen that statistical learning with e-learning is easy to understand, communicative, can be accessed with various gadget devices, and motivates students to be active. 4) learning design indicators. Based on this indicator it can be seen that statistical learning with e-learning is interesting to use, the examples are easy to understand, the learning objectives are clear, and the material can be read clearly.

Based on the small group trial(smallgroup)as a whole has a value of 4.65 or 92.96 (on a scale of 100). This value is included in the category of very good. The assessment is based on 4 aspects, namely: 1) aspects of the benefits and effectiveness of Statistics learning with e-learning. Based on this aspect it can be seen that students find it easier and interested in learning by using e-learninglearning,materials are easy to download, learning with e-learning is quite complete (there are materials, practice questions, formative tests and answers). 2) aspects of statistical learning material with e-learning. Based on this aspect, it can be seen that statistical learning material

with e-learning is easy to understand, easy to operate, the practice questions that exist support the learning objectives, and the evaluation is fair. 3) aspects of implementing statistical learning with e-learning. Based on this aspect it can be seen that the implementation of statistical learning with e-learning is easy to understand, communicative, can be accessed with a variety of gadget devices, and motivates students to be active. 4) aspects of learning design. Based on this aspect it can be seen that statistical learning with e-learning is interesting and fun to use, easy to operationalize, can enrich learning resources, and motivates to interact with friends.

Based on the responses of field trials (field trialsoverall) obtain an average value of 4 , 73 or 94.51 (on a scale of 100). This value is included in the very good category. The assessment is based on 5 aspects, namely: 1) aspects ofacceptance and attractiveness. Based on these aspects it can be seen that students find it easier and are interested in learning by using e-learning, learning by e-learning helps students understand learning material, learning with e-learning motivates the spirit of learning and provides a sense of comfort / closeness with the lecturer. 2) aspects of compatibility with the environment (appropriateness). Based on these values it can be seen that statistical learning materials with e-learning facilitate discussion with lecturers and student friends, easy to access material, according to needs, and useful. 3) aspects of effectiveness. Based on these aspects it can be seen that statistical learning with e-learning records the progress and performance of student learning, enabling students to choose the material they want to learn and need. 4) aspects of sustainability(sustainability).Based on these aspects it can be seen that statistical learning with e-learning can be accessed from anywhere and at any time, goes well using computers or gadgets, assessments are fair and the results are quickly known. 5) aspects of the ability to be(implementedimplementability). Based on these aspects it can be seen that statistical learning with e-learning is easy to use, easy to operate, there is a summary of each subject and its operation is stable and smooth.

Based on individual evaluations, small groups and field trials found that the learning model developed was feasible to use. Referring to the previous development research onlearning online, it can be concluded that there are several advantages by utilizing online learning, namely:

1. learning Online changes the learning experience in the classroom, provides additional assistance in learning for students and enables the formation of a stable and integrated learning community (Vine, 2016).

2 learning Online helps students to develop generic skills in finding and evaluating information for their learning. In addition throughlearning online, students can familiarize themselves with a number of technological tools including discussion boards, screencasts, and podcasts, all through learning management systems (Johnston, 2010).

VI. CONCLUSION

Procedure of developing the Education Statistics learning model with e-learning at UIN Sultan Maulana Hasanuddin Banten uses themodel Dick and Carey which is modified into three stages. The stages in the development of this model are as follows: **The initial stage** is to conduct an analysis, with steps: 1) Identification of instructional needs and objectives; 2) Conduct Statistics Instructional Analysis and 3) Analysis of student and environmental characteristics. **The second stage** is to develop, with steps: 1) Formulating Special Statistics Instructional Objectives; 2) Developing Statistical Assessment Instruments; 3) Develop Statistics Instructional Strategies; and 4) Developing and Choosing Statistics Instructional Materials (preparing learning materials,

preparing elearning and incorporating learning materials on elearning). **The third stage** is formative evaluation and revision, with steps: 1) expert validation; 2) evaluation of one-on-one(onetoone);3)evaluationsmall group testand 4)field try-out.

Based on the results of the formative evaluation it is known that the development of the Education Statistics learning model with e-learning at UIN Sultan Maulana Hasanuddin Banten is feasible to use

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