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# PROCEEDING

# INTERNATIONAL SEMINAR

KONVENSI NASIONAL VI & TEMU KARYA XVII APTEKINDO
FAKULTAS TEKNIK
Makassar, 3-5 Mei 2012
UNIVERSITAS NEGERI MAKASSAR

## REFORMULATING THE PARADIGM OF TECHNICAL AND VOCATIONAL EDUCATION

## NATIONAL CONVENTION VI - APTEKINDO
## THE XVII CONGRESS OF FT/FTK - FPTK - JPTK INDONESIA

**Grand Clarion Hotel & Convention**
**Makassar, 3 - 5 Mei 2012**

Badan Penerbit UNM

Fakultas Teknik
Universitas Negeri Makassar

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## PENGANTAR

Syukur Alhamdulillah kami panjatkan kehadirat Tuhan Yang Maha Kuasa, karena atas limpahan Rahmat dan Karunia-Nya, maka penyuntingan (editing) dan pencetakan Prosiding yang merupakan kompilasi dari semua makalah Seminar International ini dapat diselesaikan dengan baik.

Seminar Internasional ini merupakan rangkaian kegiatan dalam rangka Konvensi Nasional Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO) VI, dan Temu Karya XVII FT/FTK/FPTK-JPTK Universitas se-Indonesia yang diselenggarakan pada Fakultas Teknik Universitas Negeri Makassar pada tanggal 3-5 Mei 2012.

Seminar Internasional ini dengan tema "***Reformulasi Paradigma Pendidikan Teknologi dan Kejuruan"*** merupakan sarana komunikasi ilmiah yang bertujuan untuk mendapatkan konsep-konsep ilmiah dalam rangka mengoptimalkan peran Pendidikan Teknologi dan Kejuruan dalam Pembangunan Nasional dimasa datang.

Prosiding ini merupakan himpunan makalah utama dan makalah paralel, namun karena kesulitan teknis, maka yang dibukukan hanya halaman pertama dari masing-masing makalah yang berisikan judul dan abstrak, sedangkan prosiding lengkap disiapkan dalam bentuk CD yang telah dijadikan dalam format PDF. Kepada bapak-bapak dan ibu-ibu yang memerlukan makalah cetaknya secara lengkap untuk keperluan tertentu, dapat mencetak makalahnya sendiri dan melampirkannya beserta prosiding ini.

Penyuntingan terhadap prosiding ini telah diupayakan sebaik mungkin, namun kami menyadari sepenuhnya bahwa masih terdapat kesalahan dan kekurangan dalam penyusunannya. Karena itu, kritik dan saran sangat kami harapkan guna perbaikan pada masa yang akan datang.

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Semoga penerbitan Prosiding ini bermanfaat bagi kita semua.

Panitia,

Sie Makalah/Prosiding

## SAMBUTAN DEKAN
## FAKULTAS TEKNIK UNIVERSITAS NEGERI MAKASSAR

Pertama-tama marilah kita panjatkan puji dan syukur kehadirat Tuhan Yang Maha Kuasa karena atas Taufiq dan HidayahNya maka Seminar Internasional yang merupakan rangkaian kegiatan Konvensi Nasional Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO) VI, dan Temu Karya XVII FT/FTK/FPTK-JPTK Universitas se Indonesia telah berlangsung lancar dan sukses.

Kegiatan seminar international ini diselenggarakan pada Fakultas Teknik Universitas Negeri Makassar pada tanggal 4 Mei 2012, yang mengangkat tema utama "***Reformulasi Paradigma Pendidikan Teknologi dan Kejuruan***", dengan enam sub tema yaitu: (1) Pengembangan Kebijakan Pendidikan Teknologi dan Kejuruan, (2) Rekonstruksi Kurikulum Pendidikan Teknologi dan Kejuruan Berbasis Karakter dan Kewirausahaan, (3) Pengembangan Model Pembelajaran Pendidikan Teknologi dan Kejuruan, (4) Evaluasi Pelaksanaan Sertifikasi Guru Pendidikan Teknologi dan Kejuruan, (5) Pengembangan Pendidikan Profesi Guru Teknologi dan Kejuruan, dan (6) Pengembangan Kemitraan LPTK Pendidikan Teknologi dan Kejuruan.

Seminar Internasional ini menampilkan para pakar pendidikan kejuruan, baik dari dalam dan luar negeri. Oleh karena itu, seminar ini dapat lahir ide-ide dan pemikiran inovatif yang cemerlang, dalam usaha mengembangkan dan menggagas paradigma baru Pendidikan Teknologi Kejuruan. Semoga ide-ide yang telah dibahas dalam seminar ini terus menerus dikembangkan untuk memantapkan peran strategis pendidikan kejuruan bagi kemajuan bangsa dan Negara, khususnya dalam mempersiapkan tenaga kerja yang sesuai dengan kebutuhan dunia kerja.

Pada kesempatan ini saya atas nama Pimpinan Fakultas Teknik UNM dan selaku Ketua Panitia Penyelenggara Seminar International ini menyampaikan terima kasih dan penghargaan yang setinggi-tingginya kepada para nara sumber, khususnya Prof. Dr. Nor Aishah Buang dan Prof. Madaya, Dr. Rohizan Mohammad Yasin (Universitas Kebangsaan Malaysia) dan Dr. Ing. Joachim Dittrict (Jerman) yang telah hadir dan menyumbangkan pemikirannya dalam seminar ini. Saya juga mengucapkan selamat kepada peserta yang makalahnya telah dipilih untuk disajikan dalam seminar ini.

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kekurangan dan kelemahan yang terdapat dalam pelaksanaan kegiatan ini, kiranya kegiatan ini memberi makna bagi kita semua. Akhirnya, saya berharap semoga Prosiding ini dapat bermanfaat bagi kemajuan pendidikan kejuruan dimasa yang akan datang. Amin!

Wassalam
**Dekan FT-UNM,**

**Prof. Dr. H. Husain Syam, M.TP**
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## DAFTAR ISI

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## TEMA V: Pengembangan Pendidikan Profesi Guru Teknologi dan Kejuruan

## TEMA VI: Pengembangan Kemitraan LPTK Pendidikan Teknologi dan Kejuruan

# DEVELOPMENT OF LEARNING MEDIA BASED ON ACTIVE LEARNING FOR PRINCIPLES DESIGN SUBJECT TO CONDUCT STUDENTS INTELLECTUAL SKILLS

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**Abstrak:**
This study aims to accommodate the learning ability of students to do with the intellectual skills that include skill discriminate or distinguish information, defines the concept of skill, and skill in applying the rules of the course design principles. The study was designed in two stages. The first stage, a preliminary study of the principles of product development engineering courses. The second phase, further research in the form of class action research steps followed by three cycles of Lewin's model of the steps include (1) planning, (2) action, (3) observations, and (4) reflection. Implementation of the four components of relationship is seen as one cycle. Learning in classroom action research using active learning strategies, the results indicate that the product of learning the principles of design applied to the active learning strategies can enhance the intellectual skills. In conclusion, learning on the course design principles are implemented with the active learning with the help of media interactive learning can assist students in learning to apply the principles of designing a simple technological tools, so as to enhance the intellectual skills of students

***Keywords**: learning media, active learning, intellectual skills*

## Background

Principles of engineering courses is a course that accommodates the student competency standards in terms of design tools and technologies in a simple machine. Tools and technologies shall be incorporated into a simple conceptual model that begins with the mind and understand some basic knowledge of engine design that will be implemented into a prototype design tool. Teaching and research experience so far has shown that students need a long time to be able to remember, understand and apply the theoretical principles of engineering design concepts in creating ideas. The results Rais (2009) obtained findings that there is a strong influence on the implementation of project-based learning as one of the active learning model to increase student learning outcomes.

The application of active learning by Kurniawan (2009) in his study had revealed that the use of interactive multimedia that is packaged in an active learning (active learning) influence on student learning outcomes Biology Sragen SMA Negeri 2 Bioteknologi. The use of instructional media as a strategy for improving the quality of processes and learning outcomes has become imperative. Along with the demands of the current paradigm of learning that adheres to the principles of constructivist learning, the selection of media as a component of the learning must be right. Right in exposing the fact that learning is often found as a problem, such as low motivation, bored to linger in the classroom to learn to think less meaningful.

Learn the principles of design to describe a set of material that requires learning through verbal information, intellectual skills and cognitive strategies. According to Gagne (1975), as a capability, verbal information means that one can claim in proportion to what he had learned. For example, understanding the meaning, purpose and function of the material contained in the course design principles. In this contexti information on the understanding that consists of: 1) discrimination, 2) concept (the ability to recognize objects into a definition /concept of the concrete /concept definition), 3) rule (ability to apply concepts), and cognitive strategy is a way that learners have in managing the learning process, how it is attached internally as well-organized capabilities

involves remembering, thinking, and more complex is the way to solve the problem. In other words, cognitive strategy is concerned with "self-learner" or independent learners.

It seems that students have problems in raising the interest, motivation, attitude, confidence, intelligence, and knowledge impact to decrease student learning achievement. If this is allowed to continue without insiasi to improve, the quality of learning will continue to decline. Based on the facts of the theory, interesting to develop models of the development of media-based learning is active learning in the course design principles as an effort to enhance the intellectual skills of students, including the ability to distinguish, the ability to recognize objects into a definition / concept of the concrete / concept definition), the ability to apply concepts, and high-level thinking skills.

The results that provide empirical support for the urgency of this research is the study Mayer (2009) who found that the addition of certain types of pictures to words may help learners understand the instructional messages. This finding is supported by the findings of Rieber (1999), that under certain conditions learners learn better with the acquisition and retention ransfer good information if the use of computer-based learning media by adding the laws of motion and animated graphics in it.

**Problem**

Based on the above background led to the birth-related problems need to examine the meaning and role of media as an instrument of learning aids combined with active learning model is applied in practice learning design principles. This study focuses on how to find solutions for increasing the quality of processes and learning outcomes as a unit of learning that takes place on an ongoing basis. To achieve such a solution, then made a number of key research questions are: 1) how to develop media-based learning design principles of active learning?, 2) whether an increase in intellectual skills of students in course design principles after using interactive learning media, combined with learning active in class?, 3) how the response of students to instructional media design principles after following active learning in the classroom?

**Study References**

**Understanding Learning Media**

According Setyosari & Sihkabuden (2005), the media is a tool that serves as an intermediary or conduit in communication activities between communicators (messenger) and communicant (the recipient). This opinion is in line with the opinion Smaldino, Russel, Heinich, & Molenda (2005) which states that the media is a tool for communication and information resources. Media derived from the Latin meaning "between" refers to anything that carries information between a source and a receiver. When a message is published have learning objectives and intended to facilitate communication and learning, then the media kind of learning called the media. This opinion is not much different from the opinion Sadiman, Rahardjo, Haryono, & Rahardjito (1986) which states media is basically everything that can be used to deliver messages from the sender to the receiver so that it can stimulate the thoughts, feelings, concerns, and the interest and attention of students such a way that learning occurs.

Media literally means 'middle', 'intermediate' or 'introduction' (Arsyad, 2002; Sadiman, et al., 1990). According to Gerlach & Ely (in Arsyad, 2002), if the media generally understood is the human, material, or events that establish the conditions, which cause the student can acquire the knowledge, skills, or attitudes. This notion is in line with the limits presented by Gagne (1985), which states that the media are different types of components in the environment that can stimulate

students to learn. Media serves as a medium (Gagne, et al., 1988) or a mediator, which is set up an effective relationship between the two main parties in the student learning process and content. As a mediator, may also reflect an understanding that in any system of teaching, from teachers to the most sophisticated equipment that can be called the media. Heinich, et.al., (1993) provide medium term, which has a meaning that is consistent with the above limitations, namely as an intermediary that transmits information between the source and receiver.

Based on the limitations of the media as mentioned above, it can be said that the media is learning everything related to software and hardware that can be used for teaching materials convey content of learning resources to learners (individual or group), which can stimulate the thoughts, feelings , the attention and interest of learners in such a way that the learning process (inside/outside the classroom) to be more effective.

**Types of learning media usage**

Instructional media are used for learning activities in the classroom can be a media ranging from the simplest and residential use in the environment to the most sophisticated (hightech). Judging from the readiness of the procurement, the media used in the study are grouped into two types, namely the media so because it is a commodity trading and there in the marketplace in a state ready for use (by media utilization), and media design because it needs to be designed and prepared specifically for the purpose and specific learning objectives (media by design) (Sadiman, 1996). According Setyosari and Sihkabuden (2005) medium used in the classroom may be the only media use and available on the market (by utilization) and also the media that is designed specifically for the sake of learning (by design).

**1. Use of Media by utilization**

Media used for the benefit of learning from existing sources or the media used to live there and are directly referred to by the use of media utilization. It means that to use the media, can be directly done without having to redesign. The problem is whether the media to be used as a medium of learning is appropriate or in accordance with the desired learning objectives. In this context, the selection of media should be careful and really think about those aspects relating to the principles of selection and use of learning media. Types of media use is generally common in the classroom, such as textbooks, blackboards, board stickers, flannel boards, projectors, globes, maps and others.

**2. Media usage by design**

Use of learning media deliberately done by first designing the media for learning purposes referred to by the use of media design. How this is done because of the possibility after learning by designing a specific model, instructional media provided no or less directing and focusing on learning goals after that for the purposes of learning models, it is necessary to first design a learning medium.

Design of instructional media created (by design) is usually made easier because its consumer in accordance with the request and for a specific learning objectives. While the media that its use by utilization usually remains through the selection process before the media decided to buy considering the cost aspects of the aspects associated with one of the criteria for media selection. Use of these media types such as the use of software-software that is made for the purpose of learning, the use of multimedia learning animation and other media that deliberately before use (Suheri, 2006).

So that both media are essentially based on its use by utilization or by design, indicating that the use of instructional media are both expected to help facilitate the change of the role of the teacher's role as a transmitter of information or knowledge into a role as a facilitator of learning and the role of learners more actively in learning activities.

**Things that need to be considered in the use of instructional media**

In the practice of learning, can not be denied that the existence of instructional media into something that is difficult to avoid. Based on its understanding, it seems difficult to avoid the presence of media in a learning process. However, before the use of instructional media is really the case, then there are some things to consider related to the substance of the media presence. The most important thing to be considered in the use of media and learning by Setyosari Sihkabuden (2005) is:

1. Intent or goals (objectives),
2. The content or substance (content) that want to be presented,
3. Willingness,
4. Capability, and
5. Availability of learning media.

The fifth important details related to the use of instructional media are described as follows:

**1. The purpose (objective)**

Integration of instructional media into a learning process should not be separated from learning objectives to be achieved. This is the key to a successful initial use of learning media. Learning to use instructional media based learning goals without necessarily the presence of media alone is not going to mediate the learning objectives presented to participants subject learners (learner). Really important to use the media to suit the learning objectives or goals curriculum used.

**2. The content or substance that want to be presented**

Should emphasize the use of instructional media on matters relating to the following questions: 1) whether the material or media is related to the content of the curriculum?, 2) whether the media is up to date?, 3) whether the appropriate media to present the content / message the curriculum ?, 3) whether the media used meets the requirements regarding the level of difficulty / ease of use?. Answers to these questions leads to the main content focus of the substance of the use of learning media.

**3. Willingness**

The success of the use of instructional media should be preceded by the strong will of all components of learning, either from teachers or lecturers and students, or subjects of study. In this case both teachers and students must both have a strong motivation to want to use the media as a means of learning that can be used to convey message, thought-provoking, inspiring, attention, so as to encourage self-learning process in students.

**4. Capability**

The use of media to the level of willingness alone is not sufficient if not accompanied by the ability to use media. These capabilities include the ability in terms of how to use/operate, including how to read the measurement results if the media is intended for inputting data. While the media is usually there to take care of related party such as a media technology that is under the authority and

the profession. Although it is not uncommon media users often have multiple skills that can improve existing instructional media if damaged.

**5. Availability**

Availability of instructional media used to be the basis of whether the media in learning. Availability is felt when a topic to be taught to mention that the media used to teach the diversity of the forest is the video media. But after checking the media was not available, then the video media can be replaced with other media such as slides or photographs. Although there are aspects of the shift here the aspects of quality of results as possible with video capabilities to understand students better than using a photograph or slide.

Factors to consider in the selection and use of media is also presented by Dick and Carey (2001), namely 1) the suitability of media with the aim of learning behavior, 2) the availability of local resources that will determine whether the media will be bought or made, 3) flexibility, practicality and resilience of the media for a long time, and 4) cost-effectiveness in the long term.

**Understanding of active learning**

Approach to active learning (active learning) is a term in the educational world as a teaching and learning strategies that aim to improve the quality of education, and to achieve student engagement effectively and efficiently in learning. According to Zaini (2005) Active learning is a learning strategy that invites students to learn actively. In teaching and learning requires a variety of support, for example, from the point of students, teachers, learning situation, programs of study and learning tool.

The same opinion expressed by Zuhairini (1993) that active learning strategy is defined as a learning process that uses a variety of methods, which emphasize the active learners and involve a variety of potential, both physically, mentally, emotionally or intellectually to achieve educational goals related to insight into the cognitive, affective, and psychomotor optimally.

According to Bonwell (1995), active learning has the following characteristics: 1) emphasis on learning rather than on the delivery of information by the teacher but rather on developing analytical and critical thinking skills on topics or issues discussed, 2) students are not just passively listening to lectures but doing something related to the course material, 3) emphasis on exploration of values and attitudes regarding the course material, 4) more students are required to think critically, analyze and evaluate, and 5) feedback more quickly will occur in the learning process.

Meyer & Jones (1993) suggests that active learning activities occur in speaking and listening, writing, reading, and reflection that led to the elucidation of the content of lessons, ideas, and a variety of issues related to the topic being studied. In active learning, teachers act more as facilitators rather than providers of science. While Fink, (2003) mentions that in active learning, students must do more than just listen. Mentioned that in active learning, students do not learn on their own but they can learn by mentoring teachers as instructors or classmates.

According to Simons (1997) learning "active learning" has two dimensions, namely self-learning (independent learning) and work actively (active working). Independent learning refers to student involvement in decision making about the learning process to be performed. Active working refers to situations where the learners / students are challenged to use his mental abilities during learning. In active learning to become more active learners, because the students acted as subjects learned in the classroom, active learning teaching material, actively express their opinions, asked questions, develop the knowledge, problem solving, discussion, and draw conclusions (Munir, 2008).

Based on the above explanation, active learning is learning that gives learners a space for teachers and lecturers to collaborate with students and student learners in carrying out the study design, placing the learner as an object rather than subject teaching more notes, listen, and memorize, but a member of space and opportunity the learners to develop competence and creativity in all manage learning materials.

**The material characteristics of the principle of design build**

In accordance with the principles of the course syllabus design, materials include: 1) the definition, purpose and functions of product design, 2) phase-phase product design, 3) stage of product design concepts, 4) product design phase, and 5) stages of review, evaluation product design and drafting documents.

Description of each material is:

1. Definition, purpose and function of product design: the sense described in this material, purpose and function of product design in the context of learning design tools or machinery.
2. Stages of product design: the sense described in this material stages of product design, describes the stages of product design in the form of diagrams, and explain the stages of product design is descriptive.
3. Stages of product design concepts: the material is described understanding the concept of product design stage, explain the concept stage of designing products that fulfill the functions and characteristics of the product.
4. Product design phase: the sense described in this material the product design stage, explain the design phase with a sub-process product synthesis, and explain the stages of designing a product with a sub-process analysis.
5. Stages of review, evaluation of product design and preparation of documents: the sense described in this material review and evaluation stages of product design, review and evaluation stages of product design, and document preparation stage of the product

In a study of this class action, matter of discussion focused on 1) the definition, purpose and functions of product design, 2) the concept and design phase of products, and 3) stage of review, evaluation of product design and drafting documents

**Methods**

The study consisted of two phases, first phase of the research and development of the second stage which is an advanced research class action research (action research class.

**Research and development**

Development of research design principles of learning to use media-based learning is active learning instructional system development model adopted from the Dick & Carey that is arguing that the best software developers in the field of education and learning to use one model of development that has been used by experts in the field of education (Dick & Carey, 2001).

The components of the instructional model of Dick & Carey (2001) are: (1) identify the purpose of teaching, (2) to analyze teaching, (3) identify entry behavior, (4) formulating performance objectives, (5) developing grains of standard reference test , (6) develop teaching strategies, (7) develop and establish a module or teaching guides, (8) designing and conducting formative assessment, (9) revising the instruction and (10) develop and conduct summative evaluation.

**Development procedures**

Development of procedures for application of instructional media design principle of using media-based learning is active learning through the following stages:

**1. Pre-Development**

The first stage of the development procedure, the measurement of learner characteristics associated with the intellectual skills include skills to distinguish discriminate or information, defining the concept of skills, skills to apply the rule, and high-level skills. In addition, the survey also conducted an implementation study to date of its implementation is still dominant ekspositaori who became one of the causes of low student achievement of learning outcomes. At this stage, also performed a conceptual analysis aimed at the assessment of the various principles, concepts, and principles of the model of instructional media design principle of using media-based learning is active learning.

**2. Development**

In this development, the activities carried out are:

**a. Develop Research Instruments**

Instruments used in this study is an instrument to measure the level of intellectual skills of students based on the theory of Gagne and assessment instruments to test the acceptability of experts and prospective users of the product. The same test to measure levels of intellectual skills of students is given to students at the end of each learning topic. Assessment format is used to assess the quality of multimedia learning guide model development by expert design and content experts (Psychology and Learning Technology).

**b. Develop a Learning Media**

Develop instructional media design principles using the media-based learning is active learning to write in full of all the materials obtained in the previous stage, into the prototype model of development that has been intact.

**c. Evaluation**

The evaluation intended to determine the quality of the application of the principle of the development model of instructional media design media-based learning is active learning by test specialists, test a small group (teachers) and test a large group (of students).

**3. Product Trial**

**a. Test Expert**

Dick and Carey (2001) suggested three stages of trials designed to assess teaching developed in order to become more effective, namely: (1) Assessment of experts, (2) assessment by a small group (faculty), and (3) large group (of students) . Expert test design is intended to test the application of models of active learning-based multimedia development that will be used to establish akseptabilitasnya. Expert judgment is the first phase of trials conducted after the model of active learning-based multimedia development is completed. The goal is to find out the weaknesses of the model through active learning strategies. The assessment is carried out by expert design and content (the science of mechanical engineering, psychology and technology and learning).

**b). Small Group Test**

The objective of this pilot phase is a lecturer in mechanical engineering, means that before students are given treatment, first teacher guide provided with the use of multimedia-based learning model of active learning. The goal is for teachers to understand the steps in the implementation stages later.

**c). Field Trial**

Field trials carried out on a class totaling 52 students majoring in Agricultural Technology Education. For this purpose a field study conducted by teaching a class action. Classroom action research carried out in 5 cycles according to the amount of material that is prepared in the course design principles. Notch researchers in the implementation of classroom action research is as a teacher (lecturer) who observed directly the activities of student learning in the classroom.
Here is the class action phase of the research that starts from stages planning, implementation, evaluation, and reflection.

**1. Class Action Planning Phase**

At this stage a number of activities carried out by researchers include: 1) analysis of student learning problems related to student learning characteristics such as: the ability to distinguish and define the concepts and skills to apply principles into concrete concepts. This is related to competence to learn the principles of design that facilitates the ability of students to design a simple machine engineering report. Teaching experience showed that the average student taking this course, especially students taking the final (D III) is weak in formulating the concept. This fact learned the need to develop alternative learning encourages the student closer to real problems. The concept of learning by adopting active learning using interactive learning media to be one answer to the solution of problems which experienced students. 2) design a research instrument in this study where the presence of faculty as a lecturer and research are key instruments that will observe and assess the direct implementation of learning. 3) designing measures based on the cycles of action research studies class that was introduced by Lewin interpreted by Kemmis. Lewin Model developed by Kemmis describe several spiral cycles of activity, which in this context as well as research activity is defined as a cycle consisting of (1) planning, (2) action, (3) observation , and (4) reflection (Susilo, 2009).

**2. Class Action Implementation Phase**

Classroom action research conducted Lewin refers to the model, namely:

**First cycle:**

At this stage of discussions with the team teachers, and students associated with the problem of learning the principles of engineering courses encountered by faculty and students. The following step is to observe the ongoing process of learning with a focus on improving the quality of observational learning design principles through the use of media-based learning is active learning in the classroom. The following step is to develop measures to implement the learning tailored to the number of items to be discussed. In accordance with the plan, the amount of discussion in this study is composed of three subjects, namely: 1) the definition, purpose and functions of product design, 2) the concept and design phase of products, and 3) stage of review, evaluation of product design and drafting documents. Implementation of the first act begins by discussing the matter first: definition, purpose and functions of product design by using a video about the design of the product on Agricultural Technology Education majors class. Implementation of the learning is done until the conclusion of the advantages and disadvantages during the learning takes place. Deficiency at the first meeting would be a material improvement for the next meeting. Deficiencies can be seen from the aspect of the use of video learning, clarity of purpose, and effectiveness of achieving the goal of learning is able to accommodate the basic competencies or not.

**Second cycle:**

At this stage the focus group discussion on active learning strategies to be applied in learning the principles of design build. The application of active learning is applied to provide opportunities and learning space for students to construct learning, formulating the problem of each topic, search and find solutions to problems that ended in a conclusion of a study group. This strategy is applied after a learning experience on the first cycle. In the second cycle of the learning phase of this material and product design concepts are presented using active learning strategies. Observation of the implementation of learning and focus group discussions conducted in order to provide meaningful findings in achieving the goal of learning the principles of design.

**Third cycle:**

At this third stage, based on observations and findings from focus group discussion improvement of the quality of the learning process by using the design principles of active learning strategies continue to be made. The use of interactive learning media in the context of the effectiveness of learning outcomes continue to be studied in an effort to find and result in improved teaching and learning process continuously. The third cycle is a cycle end after the whole presentation materials engineering principles in the study ended. This third cycle, to have discussions with the students together. Each student is given the opportunity of expression related to the implementation process of learning the principles of design with the help of instructional media through the principles of active learning strategies.

**3. Observation and Evaluation Phase**

Observations made by the lecturers themselves as well as researchers in this study. Observations focused on the learning process by looking at aspects of student intelligence. Learning ability of students that include skill discriminate or distinguish information, defines the concept of skill, and skill to apply the rule to be the main focus of the observation results of studying the principles of design.

Stage of the evaluation performed on each cycle. Evaluation carried out jointly by both the lecturer to students, and students against students, in accordance with the principles of active learning that each unit of learning includes faculty and students should be able to express their evaluations together. The goal is to obtained some drawback in the process of learning to be done to improve the next cycle.

**4. Reflection Phase**

Reflection is a key stage in the research class actions related to improvements in the entire cycle, especially in the planning and implementation cycle of action. The basis of reflection is the use of theory and practice of learning, the experience of the teaching and learning, and research data that is associated to a conclusion from the results of other research class action. Conclusion of the study is a product of the analysis, interpretation, and the interrelation of theory of learning.

**5. Subject, Location and Time Studies**

The study subjects consisted of 52 students for a course class S1 Agricultural Technology Education 2011. Location of research at the Department of Education Mechanical Engineering Faculty of Engineering UNM. Implementation peneltiaan held on the second semester beginning February 6 through March 30, 2012.

**6. Data Collection Techniques**

The research data collected by the method of observations made in classrooms, libraries and laboratories. Interview conducted on 25 students study program of

Agricultural Technology, Education S1 2011 FT UNM force. Diaries are used to record all research activity.

**7. Data Analysis Techniques**

Data collected from observations, interviews and diaries were analyzed qualitatively consistent with the objectives of the study. Data analysis was carried out in three stages, namely the reduction of data, exposure data and the inference results of the analysis.

**Analysis And Discussion**

The results obtained class action based on study designs that have been implemented. Results of the study include: 1) Product development (research introduction), 2) the implementation phase of the class action, and 3) the intellectual intelligence of students as a result of the learning companion.

In the implementation phase of a class action consisting of three cycles of the first cycle, second cycle and third cycle. Each cycle has a different learning activity, so the response students also different, but the results showed an increase and improvement of learning to learn skills.

**1. First Cycle**

Tests of learning the principles of media design featuring the first material that is the definition, purpose and functions of product design, based on interviews with 6 students, who represent the study group, obtained the final results relating to the active learning media and student responses are described as follows: 1) This device Learning Media, video and pictures of examples of design and detail design of the display is still too complicated to be understood by students. In addition students are less vibrant look. The use of media is still lacking a lot of power point to give examples of real images in the field of agricultural machinery or machine design appropriate technology.

On the learning, the use of letters in the letter the type of teaching materials is sufficient to match the characteristics of students, both types of letters, coloring, and a case study. Interviews with 4 students obtained data, that the media is displayed quite good learning and fun, can find out directly the events or events on the principles of design through the medium of animation, add insight and learning experience using active learning media. Three students commented that learning is fun enough, but students still need considerable time to understand the material because of difficulties in developing an idea or ideas in groups. Based on this research can be concluded, that the media is displayed in the form of learning that video and animated images that appear to be improved so that students can more easily understand the concepts and theories based on the language to distinguish the concept drawings. Student responses at the beginning of the learning is still difficult to understand the stages in the design and differentiate the concept design. Students need learning strategies that can accommodate the learning characteristics of the design principles. This problem will be fixed in the next stage of learning, ie in the second cycle.

**2. Second Cycle**

Tests of learning media design principles using active learning strategies show both materials and product design concept stage. Based on interviews 6 students obtained the final results related to the medium of learning and student responses: 1) The medium of learning is very interesting, very challenging material to be learned discussion and conduct trials. However, the ability to distinguish the concept of understanding the concept and design is still limited to a specific collaborative groups. Active learning strategies require all students have the ability to understand the concept equally. For some members of the exchange was done in study groups. Students who have more understanding and have a level of understanding included in the group who are still experiencing slowness to understand the concept of the theory. 2) The application of

active learning implemented a lot of fun, motivating learning, there is the creative process and convey ideas and innovation in product development ideas. At this stage, each group learned to make a simple product development plan is based on material obtained. While these examples show the results of design tools, design tools and methods, students learn to assess and examine every stage of design.

Based on this second cycle can be concluded, that the students already have the skills to distinguish discriminate or information, defining the concept of skill, and skill to apply the rules. Active learning strategies in the second stage of the cycle requires that students be able to present the results of the design of products as part of learning to apply the rules. Only, who is still weak in the second cycle is a collaborative student does not have the ability to argue. For the sake of it, then the student is given a percentage of video on the technique effectively. These problems will continue to be fixed in the next cycle.

**2. Third Cycle**

Tests of learning the principles of media design featuring a third matter, the stage of review, evaluation of product design and drafting documents. Based on the results of interviews with 6 students obtained the final results related to the medium of learning and student responses are described as follows: 1) The entire device is very attractive instructional media, particularly video media on learning. 2) active learning is fun and improve student motivation to learn. The results of students who represent the direct impact of learning outcomes that include skills distinguish discriminate or information, defining the concept of skills, and skills are obtained through applying the rules of the pretest and postes. From the results of the pretest with the values obtained range 1-100 class average is 37.45. After learning to use a medium of learning with active learning strategies, the average grade obtained postes 75.58. Improved student learning outcomes is quite good intellectual. Thus the media-based learning is active learning in the course design principles in order to form the intellectual skills of students considered to be perfect.

Based on the results of data analysis, implementation of the research activities of the class action ends up on the third cycle. Due to this cycle of learning media has been repaired and deemed appropriate for use as a medium of learning the principles of design.

**Conclusion**

Based on the results of data analysis and discussion can be concluded, that the development of instructional media design principles with instructional strategy use of active learning produce effective learning increase the intellectual skills of students.

Classroom action research conducted in three cycles. In the first cycle of students is still difficult to understand the stages in the design and differentiate the concept design. Students need learning strategies that can accommodate the learning characteristics of the design principles. Once fixed in the second cycle, students already have the skills to distinguish discriminate or information, defining the concept of skill, and skill to apply the rules. It's just that only in this second cycle students do not have the ability to argue. For the sake of it, then the student is given a percentage of video on the technique effectively. In the third cycle, the applied active learning is fun and improve student motivation to learn. The results show that the response of students in learning the principles of design with the help of instructional media is packaged in an active learning to improve skills regard perfectly distinguish discriminate or information, defining the concept of skill, and skill to apply the rules.

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