RESEARCH ARTICLE

DEVELOPMENT OF ECONOMETRIC TEACHING BOOKS BASED ON MULTIPLE DISCOVERY.

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Manuscript Info	*Abstract*
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This study aims to produce a textbook based on guided discovery valid, practical, effective for lectures econometrics. This type of research is research and development. The products that will be developed in this study is based econometric textbook guided discovery. This study uses research design development with 4-D model of development which consists of four stages which include: defining, design, development , and dissemination.This study begins with a define, which analyzes the course syllabus econometrics. Syllabus analysis performed to see if the material being taught in accordance with the expected competencies. The next activity is to analyze the reference books for the course econometrics. Analysis conducted reference book aims to see whether the contents of the book results with competence in the syllabus. At the design stage is produced textbook for lectures econometrics for one semester. This form of textbooks designed based on the characteristics of guided discovery, the students are guided perform data processing and interpretation of processed data and draw conclusions. At this stage of development, do is validate, test the practicalities and the effectiveness of textbooks and the last stage is the desseminate, using textbooks that have been validated.

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Introduction:-
The learning process is a series of several systems that are interrelated with each other. If one system cannot function, the system cannot work optimally. The learning process will be more optimal if you can use the media around you. The use of media in the learning process is expected to help lecturers to be easier in teaching material to students. Some of the things that cause this to happen are the viewpoint of lecturers that learning media is an expensive and difficult tool for lecturers to make themselves. One of the media that is often used in the learning process on campus is printed books and dictates / learning modules. Therefore lecturers generally use printed books and dictates / learning modules obtained from publishers (not made by lecturers themselves) so that the material given in the printed book is not in accordance with the material to be taught by the lecturer.

In an effort to increase the effectiveness of the learning process, in addition to learning strategies, textbooks also play an important role. Students are people who are in the process of becoming scientists, and therefore systematic steps must be planned so that the process runs well. Textbooks are an important component as a step towards "reading" textbooks that have a difficult level of depth for students.

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Less learning resources make students experience difficulties in lectures, for example when doing exercises. Students need a lecture material in the form of a structured textbook beside a textbook. This textbook is a compilation of guidebooks and a collection of practice questions that have been packaged in such a way that is made in stages to train and improve student skills and improve understanding of the stages in conducting data analysis.

The problem in this study is that students have relied on examples of textbooks and explanations from lecturers only when the recovery took place. This method is of course not optimal because the discussion of the questions in the text book has not helped students in constructing their knowledge and the explanation given by the lecturer is limited by time. If given training or homework only students who are classified as smart are working on their own, the rest are examples of what has been done by his friend. This indicates that students' motivation and activities in lectures are relatively low which results in student learning outcomes being low. This study aims to produce textbooks for econometrics lectures (Theory and Applications with SPSS and Eviews) that are valid, practical, effective.

Learning and teaching books are two things that are complementary. Learning will take place effectively if it is equipped with learning media, one of which is textbooks. Textbooks can be designed and used well if you pay attention to a number of principles in learning. The learning component consists of students, instructors or educators, teaching materials / materials, how to present teaching materials, and practice. A good textbook has reflected the unity of all components, so that teaching materials, how to present teaching materials, and training teaching materials can be easily understood and practiced, both by students and teachers.

In essence, textbooks are learning media for a particular scientific discipline or knowledge. As a media, teaching books must contain teaching materials, how to present teaching materials, and instructional material training models. The material used as instructional material must be presented in a certain way, so that students have abilities relating to understanding, skills, and feelings. As a reflection of these abilities, students will be able to solve problems, both those proposed in practice and problems in real life. Textbooks must also be able to help teachers improve their teaching methods, and help them improve their abilities.

In order for the textbook to be used properly, students need to examine the parts in the textbook, starting from the title of the book, the table of contents, the titles of each chapter, the form of questions and exercises, to the end of the textbook. A brief review of the contents of the book will lead to interest and attention of students to understand the contents of the book.

The quality of textbooks depends on their use for student learning needs. The more needs that can be served, the better the textbook. For example, giving students the opportunity to learn according to their own pace; to conduct deepening; to make revisions and reflections; or to record important things for other purposes. The quality of teaching books thus does not only lie in the design of the book itself, but also on its usefulness. A good textbook is not just a collection of ideas, but a programmed and systemic design so that it becomes a useful, concise but meaningful work.

The learning process is the essence of implementing education in high education. The demands of the community for efficiency, productivity, quality effectiveness, and the usefulness of the results in the implementation of the learning process in high education is a necessity. But in the implementation of lectures in the classroom it turned out to be faced with problems that hinder the success of the learning process. The problem that occurs and is very worrying for lecturers is the low participation of students in the process of teaching and learning activities in the classroom.

Literature Review
In the lectures that have taken place all this time, students tend to just sit, be quiet, and just listen without giving a response that is relevant to the lecture material. During the lecture there were no questions or ideas related to lecture material. This trend is an obstacle for lecturers because it causes the achievement of mastery of lecture material by students is very low. Efforts to increase student participation in lectures are important things to do, because they are closely related to the success of education in high education. To foster student learning motivation so that it is expected to increase participation in lectures, learning must be creatively designed, which enables interaction and negotiation to create meaning and construct meaning in students and teaching staff, so that meaningful learning is achieved. One method that can make students active in learning is a guided discovery method. According to

Suryobroto (2002: 193) stated that the method of discovery is a mental process where students assimilate something concept or something principle. The mental process, for example: observing, classifying, making guesses, explaining, measuring, making conclusions, and so on. According to Wasriono, et al (2015: 61) the product development of learning devices is said to be practical if the assessment of student responses and teacher responses has a practical category.

Guided discovery learning model is a learning model that is student oriented with trial and error techniques, guessing, using intuition, investigating, drawing conclusions, and allowing teachers to do guidance and guidance in helping students to use ideas, concepts, and skills they have for discover new knowledge (Purnomo, 2011)

Guided Inquiry or guided discovery approach can be an alternative that can improve students' conceptual understanding. In this approach students are actively involved in working together to find, explore, explore, experiment, explore various situations, to discover and construct new ideas, new knowledge, based on various sources of information and initial knowledge or concepts that have been mastered before, and subsequently concluded, tested the conclusions and gave a report on the results of his work (Sahat Saragih and Vira Afriati, 2012)

Guided discovery learning models focus on the learning process, such as student interactions, student-instructional materials, and student-teacher; besides aiming at developing scientific inquiry activities in the content domain. Students accept the problem, and the teacher gives instructions and directions on how to solve it so students find concepts from the content of the lesson and find new structured, organized and meaningful ideas or ideas. In the classroom there is a balanced control of students and teachers. Thus students are more emphasized to obtain optimal content understanding through science inquiry activities (Parno, 2014)

Guided discovery learning activities emphasize learning experiences directly through inquiry activities, discover concepts and then apply concepts that have been obtained in everyday life. While learning activities oriented to process skills emphasize direct learning experience, active student involvement in learning activities, and the application of concepts in everyday life. Students are encouraged to think critically, analyze themselves, so they can find general concepts or principles based on the material / data provided by the lecturer.

According to Trianto (2007: 26) the advantages of learning guided discovery methods are: This knowledge can be long-lasting, easy to remember and easy to apply in new situations, improve reasoning, analysis and student skills to solve problems without the help of others, increasing student creativity to continue learning and not only accept it, and are skilled in finding concepts or solving problems.

Methodology:-
The type of research conducted is research and development . According to Sugiyono (2012: 407) research and development is a research method used to produce certain products and study the effectiveness of these products. To be able to produce a particular product, it is used research that is needs analysis (used survey or qualitative methods) and to test the effectiveness of these products in order to function in the wider community, research is needed to test the effectiveness of these products (experimental methods are used). The product to be developed in this study is a guided discovery-based econometrics teaching book. This study used a development research design with a 4-D development model designed by Thiagarajan, Semmel, and Semmel (Trianto, 2007: 65). The development model consists of 4 stages which include: define, design, develop, and spread.

In the define phase, the activities carried out are as follows: Analyzing the syllabus, this aims to determine whether the material taught is in accordance with the standards of competence and basic competency of the econometrics course; Analyzing econometric textbooks, to see the suitability of the contents of the book with the competency standards and basic competencies students must achieve; Review the literature related to the development of textbooks, to see references to textbooks and Guided Discovery-based learning; Interviewing with colleagues and students, it aims to find out what problems are faced in the field in relation to econometrics lectures

At the design stage the teaching book is made up of 15 chapters which can be used for one semester, the material of each chapter is:
1. Basics of econometrics
2. Simple regression modeling
3. Multiple linear regression modeling
4. Selection of functional forms in the regression model and their application to financial data
5. Testing and improving OLS assumptions: Normality
6. Testing and improving OLS assumptions: Multicollinearity
7. Testing and improving OLS assumptions: heteroscedasticity
8. Testing and improving OLS assumptions: autocorrelation
9. Modeling Econometrics
10. Univariate time series and its application to financial data
11. Modeling uses panel data and its application to financial data
12. Simultaneous equation models
13. Model limited dependent variables: probit and logit, and tobit models
14. Autoregresive moving average (ARMA) and ARIMA models
15. Model autoregresive conditional heteroskedastisity (ARCH) and GARCH

Each textbook contains competency standards, material descriptions, examples of questions, guided exercises, independent exercises, feedback, follow-up, and answer keys. Each textbook consists of several learning activities that have been adapted to the syllabus.

The stage of developing the action taken is validation, testing the practicality and effectiveness of textbooks and the last stage is the stage of distribution (desseminate).

Results And Discussion:-
The activity to obtain this textbook begins with passing the defining stage. At this stage an analysis of the econometrics course syllabus is carried out. Syllabus analysis is conducted to see whether the material taught is in accordance with the expected competencies. The material on the syllabus is in accordance with the competencies that must be achieved by students. The order of the material is in accordance with the basics of econometrics and the introduction of SPSS and Eviews is the first material which is the basis for students to learn and understand before learning the next material.

The next activity is to analyze the reference book for econometrics courses. The analysis of the reference book conducted aims to see whether the contents of the book are in accordance with the competencies in the syllabus. From the various books analyzed it was found that the language used by the books was very theoretical and less communicative with students so that many students had difficulty understanding the material of the book and the difficulty of practicing the material of the book with SPSS and Eviews software. In addition, the material and exercises presented in the book are able to invite students to learn meaningfully.

After analyzing supporting books for econometrics courses, the next activity that the researchers did was to discuss and conduct interviews with colleagues. From the results of discussions with colleagues, it was concluded that the difficulties experienced by students were understanding the concepts, students were less able to develop the information they obtained in face-to-face lectures, logic and mathematical methods of thinking students who were unable to construct knowledge, students were often unable to develop theories, there are still many students who memorize the theory without understanding the meaning contained.

Based on the observations of researchers in the class, it is known that the learning that has taken place so far is still dominated by lecturers as information centers. Most students have not been able to develop information obtained in face-to-face lectures, and are more likely to rely on lecturers to find concepts. It was also found that some students had difficulty processing data with SPSS and Eviews software, and even interpreting the results of the data could not.

Based on the syllabus analysis, analysis of the reference syllabus and based on discussions with peers can be stated that in general students still rely on lecturer explanations in the class so that a textbook is needed which is able to

guide and construct student understanding. Therefore this textbook will facilitate students to learn to understand the concepts of econometrics and practice it with the help of SPSS and Eviews software.

At the design stage, the designed textbook is a guided discovery-based textbook for econometrics lectures. This textbook was prepared designed for econometrics lectures for one semester consisting of 15 subject matter. This form of teaching book is designed based on the characteristics of guided discovery, namely students are guided to do data processing and interpret the results of processed data and draw conclusions.

The characteristics of the textbooks of the design results are presented in detail, namely: 1) Each teaching material has a course identity. Course identity aims to give information to students about the study material to be discussed, 2) Each teaching material contains learning outcomes / competencies related to the IQF, so that students and lecturers as users of this teaching material can understand learning outcomes. / competencies related to KKNI that must be achieved by students. 3) teaching materials contain the subject matter to be discussed in teaching materials.

The main material of this material is intended for users of teaching materials to know what is discussed in the textbook. 4) teaching materials describe the material in accordance with the subject matter by using language that is more easily understood by students. 5) Each teaching material has examples of econometrics that must be completed manually or with the help of SPSS and Eviews software.

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According to Lusiana and Andari (2015: 991) that the use of guided discovery models in learning is one way to optimize understanding, activities and student achievement. Giving assignments in a structured manner is expected to encourage students to study these materials in a directed manner.

In essence, textbooks are learning media for a particular scientific discipline or knowledge. As a media, teaching books must contain teaching materials, how to present teaching materials, and instructional material training models. The material used as instructional material must be presented in a certain way, so that students have abilities relating to understanding, skills, and feelings. As a reflection of these abilities, students will be able to solve problems, both those proposed in practice and problems in real life. Textbooks must also be able to help teachers improve their teaching methods, and help them improve their abilities.

Textbooks are lecture materials that consist of a series of lectures and are arranged specifically, clearly and interestingly which includes the contents of the material, examples of questions, and practice questions. Nasution (2008: 205) suggests teaching books are a complete unit that stands alone and consists of a series of learning activities arranged to help students achieve a number of objectives specifically and clearly formulated. Textbooks provide opportunities for students to study independently, because each student will use different techniques in solving a problem.

Thus it can be concluded that the teaching book is a type of book intended for students as a basic knowledge, and is used as a learning tool and is used to accompany lectures. In order for the textbook to be used properly, students need to examine the parts in the textbook, starting from the title of the book, the table of contents, the titles of each chapter, the form of questions and exercises, to the end of the textbook. A brief review of the contents of the book will lead to interest and attention of students to understand the contents of the book.

The quality of textbooks depends on their use for student learning needs. The more needs that can be served, the better the textbook. For example, giving students the opportunity to learn according to their own pace; to conduct deepening; to make revisions and reflections; or to record important things for other purposes. The quality of teaching books thus does not only lie in the design of the book itself, but also on its usefulness. A good textbook is not just a collection of ideas, but a programmed and systemic design so that it becomes a useful, concise but meaningful work.

Suherman (2003: 212) explained that in the method of teaching with the discovery method hopes that students really actively learn to find their own material learned. In addition, the guided discovery method according to Sabri (2005: 2012) is a way of delivering econometric topics so that the learning process allows students to find their own econometric pattern or structure through a series of past experiences that are under the guidance of the educator concerned. In guided discovery learning the task of the lecturer as a facilitator.

While Hudojo (2003: 123) argues that the method of discovery is a way of delivering topics of subject matter, so that the learning process allows students to discover for themselves the patterns or structures of subject matter through a series of past learning experiences. The information that must be learned is not presented in the final form, students are required to carry out mental activities before the information learned can be understood.

Thus it can be affirmed that discovery methods are intentionally designed to increase the activity of larger, process-oriented students to find out the information needed to achieve instructional goals. Thus the discovery method is oriented to the process and results together. Learning activities like this make students active in the learning process, lecturers only act as facilitators to manage the course of learning. This learning process has a positive impact on the development of students' thinking creativity.

The findings of this study are supported by the results of the Estuningsih (2013: 27) study which found that developing a Guided Discovery Based Worksheet to develop guided discovery based worksheets can improve student learning outcomes. Furthermore, Parno (2014) guided discovery model learning can improve student learning achievement.

The guided discovery model refers to the theory of constructivism, which requires learning as an active activity, where students build their own knowledge and seek their own meaning from something they learn. Therefore, the material studied can reach a high level of ability and last longer because students are involved in the discovery process (Nu'man, 2012).

Conclusions and Recommendations:-
Based on the research that has been done, it can be concluded that,the textbook has been designed, and is ready to be tested for practicality and effectiveness,the designed textbook is entitled "Econometrics Textbook Based on Guided Discovery", the structure of the textbook content of the draft results includes the following ; Contains learning objectives (competency standards) in the form of achievements that must be achieved during lectures, Contains theory, but contains material descriptions in accordance with the competencies that will be taught by the lecturer, Contains guided exercises with incomplete entries, so students need to be guided to complete the textbook, Contains guided practice and independent practice. Guided exercises are exercises that are accompanied by directions. While independent training requires the independence of students in solving questions. By completing practice questions, students are expected to work and experience the knowledge themselves, Textbooks contain conclusions, a part that must be filled by students in the form of conclusions of lecture material one meeting, the questions in the textbook guide students to construct their knowledge.

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