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Indrayati [1*], Basuki Rahmat [2], Imam Mulyono [3], Slamet [4]

[1,2,3] Lecturer of Accounting Department, State Polytechnic of Malang, Indonesia,
[4] Lecturer of Management Department, UIN Maulana Malik Ibrahim Malang, East Java, Indonesia

Corresponding email: indrayati@polinema.ac,id

Abstract

The purpose of this study was to improve students' knowledge, skills in understanding the concepts and theories of Accounting Information Systems by using discovery learning and project-based learning and evaluation of their application with a survey questionnaire. This type of research is qualitative with a sample of 400 students and the learning methods are characterized and solve problems to create, combine, and generalize knowledge, learner-centered, activities to combine new knowledge and existing knowledge. Project based learning is an active student learning method where students are given assignments / projects to design and apply the Accounting Information Systems theory to the real world to find a result of the practice of implementing Accounting Information Systems in the industry. The results show that the discovery and project methods are able to improve and enhance the learning competence of all students. Research results provide new theory and practical results of discovery and project learning and advance discovery learning reform and project based learning. This research is in the application and development of discovery learning methods and project-based learning applied to the Accounting Information Systems course and its impact on students' basic knowledge to skills, collaboration, and communication.

INTRODUCTION

Discovery learning is an essential part of the national learning system. In this method, students are encouraged to identify what they want to know, followed by looking for information themselves, organizing or forming (constructively) what they know and understand. By applying discovery methods repeatedly can increase the ability of

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individual self-discovery. This method changes the passive learning conditions to become active and creative. Changing teacher-oriented learning to student-oriented. This learning concept forms concepts that allow generalization or is called a coding system in the sense of the relations (similarity and difference) between objects and events. In the learning process with this method, the teacher only acts as a guide and facilitator who directs students to find concepts, propositions, procedures, algorithms, and the like.

One of the learning methods recently used in advanced schools is the discovery method Hung, T. C. K et al (2016); Khabibah, E. N (2017); Kistner, S., et al (2016); Kunsting, J (2016). This is because this method: 1) is a way to develop active student learning; 2) by discovering and investigating the concepts learned by themselves, the results obtained will last a long time in the memory and are not easily forgotten by students; 3) a meaning that is found by itself is one that is really mastered and easy to use or transfer in other situations; 4) by using discovery strategies, children learn to master one of the scientific methods that can be developed by themselves; 5) students learn to think critical analysis and try to solve their own problems, this habit will be transferred in real-life Ennis, (1998); Facione, P. A. (2011); Haseli, Z. (2013); Lunerburg, F. C. (2011).

Project-based learning is a learning method in which the teacher as a facilitator and supervisor gives assignments/projects to do something related to theory to be applied in the real world, such as designing and implementing accounting information systems and related procedures in the industrial world. In project-based learning, students must understand concepts and principles and develop complex problem-solving practices/skills. Learning materials directly from sources, interviews, documents from the real world (evaluation, repair/updating, development). The use of technology is the main thing, and students can work in groups, collaborate with others, construct, contribute, and synthesize information. In this method, learners as reviewers, integrators, presenters of ideas become graduates with character (character) and skilled in self-development, independence and lifelong learning Aldabbrus. (2018); Doyin, (2019); Sinaga, (2017).

LITERATURE REVIEW

Project-based learning is a learning method in which the teacher as a facilitator and supervisor gives assignments/projects to do something related to theory to be applied in the real world, such as designing and implementing accounting information systems and related procedures in the industrial world. In project-based learning, students must understand concepts and principles and develop complex problem-solving practices/skills. Learning materials directly from sources, interviews, documents from the real world (evaluation, repair/updating, development). The use of technology is the main thing, and students can work in groups, collaborate with others, construct, contribute, and synthesize information. In this method, learners as reviewers, integrators, presenters of ideas become graduates with character and skilled in self-development, independence, and lifelong learning Aldabbrus. (2018); Doyin, (2019); Sinaga, (2017).

Discovery Learning

The Discovery learning model is defined as a learning process that occurs when students have not presented information directly. Still, students are required to organize their understanding of the information independently. Students are trained to become accustomed to being a scientist. They are consumers, but they are also expected to play an active role, even as actors in creating knowledge. According to Hosnan, M. (2014), discovery learning is a model for developing an active learning

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method by discovering by yourself, investigating yourself so that the results obtained will be faithful and long-lasting in memory. Through discovery learning, students can also learn to think analytically and try to solve their own problems. According to Sani (2014), the discovery learning model is a learning process that occurs when the lesson is not presented with a lesson in its final form. Still, students are expected to organize it themselves. Discovery is finding a concept through a series of data or information obtained through observation or experiment.

Discovery learning is a mental process where students can assimilate a concept or principle. These mental processes include observing, digesting, understanding classifications, making assumptions, explaining, measuring, making conclusions, and so on (Sumadi, 2002). According to Ruseffendi. (2005) the discovery learning method is a teaching method that regulates teaching so that the child acquires knowledge that they do not know, not through partial or complete notification of their own discovery. According to Ma'ruf. (2009), the discovery learning method is a method to develop active student learning by discovering by themselves, investigating for themselves, so the results obtained will be loyal and long-lasting in memory and will not be easy for students to forget.

The basis of the survey was on 13 classes with 400 students taking the Accounting Information System course in the Department of Accounting, State Polytechnic of Malang Indonesia, by answering a questionnaire. 390 students answered the questionnaire with a response rate of 97.5%.

Types and Forms of Discovery Learning

According to Jamil (2014), there are two ways in discovery learning, namely:
a. Free discovery learning is discovery learning without any clues or directions.
b. Guided discovery learning requires the role of the teacher as a facilitator in the learning process.

Characteristics and Objectives of Discovery Learning

According to Hosnan, M. (2014), the characteristics or characteristics of discovery learning are (1) exploring and solving problems to create, combine, and generalize knowledge, (2) student-centered, (3) activities to combine new knowledge and existing old knowledge.
Meanwhile, according to Bell, the discovery learning method has the aim of training students to be independent and creative, including the following (Hosnan, M, 2014).
a. In the discovery, students have the opportunity to be actively involved in learning. The fact shows that the participation of many students in learning increases when discovery is used.
b. Through learning with discovery, students learn to find patterns in concrete and abstract situations and predict much additional information provided.
c. Students also learn to formulate questions and answer strategies that are not ambiguous and use questions and answers to obtain useful information in finding.
d. Learning in discovery helps students form effective ways of working together, share information, and listen to and use other people's ideas.
e. Several facts show that the skills, concepts, and principles learned through discovery are more meaningful.
f. The skills learned in discovery learning situations are more easily transferred to new activities and applied in new learning situations.

Advantages of Discovery Learning
a. Helping students to refine and enhance cognitive skills and processes. The discovery effort is key in this process, depending on how one learns to learn.

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b. The knowledge gained through this method is very personal and powerful because it strengthens understanding of memory and transfer.
c. Generating pleasure in students because the growing feeling of investigating and succeeding.
d. This method allows students to develop quickly and at their own pace.
e. Causing students to direct their own learning activities by involving their own intellect and motivation.
f. This method can help students strengthen their self-concept because they gain confidence in working with others.
g. Student-centered and the teacher plays an active role in issuing ideas. Even teachers can act as students and as researchers in discussion situations.
h. Helping students eliminate skepticism because it leads to final and certain or certain truths.
i. Students will understand basic concepts and ideas better.
j. Assist and develop memory and transfer to new learning process situations.
k. Encourage students to think and work on their own initiative.
l. Encourage students to think intuition and formulate their own hypotheses.
m. Provide intrinsic decisions.
n. The learning process situation becomes more aroused.
o. The process of learning includes all aspects of students towards the formation of a whole human being.
p. Increase the level of appreciation in students.
q. The possibility of students learning by utilizing various types of learning resources.
r. Can develop individual talents and skills.

MATERIAL AND METHOD

Classroom Action Research

This research is a classroom action research known as the lewis model interpreted by John (1991). These two authors argue that: classroom action research is a form of reflective research carried out by actors in social society and aims to improve their work, understand the work and situations in which this work is carried out, including in the field of education (Kemmis & Carr, 2005). Classroom action research is also described as a dynamic process in which the four aspects of planning, action, observation, and reflection must be understood not as static steps, resolving by themselves, but rather as moments in a spiral related to planning, action. , observation, and reflection (Rochiati, 2005).
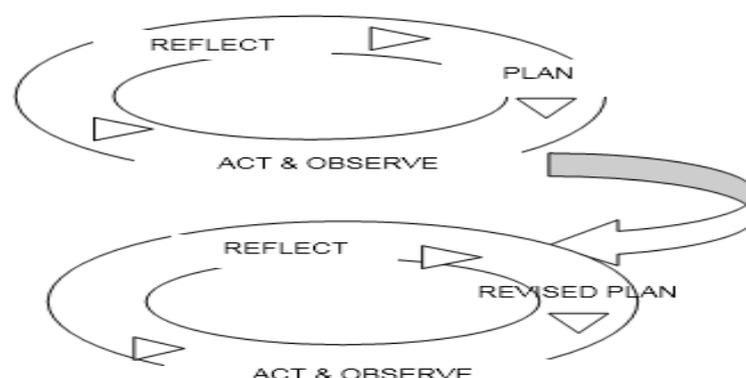

Figure 3.1 the Action Research Spiral by Kemmis & Taggart, 1988

Classroom action research, according to Moleong, M.A. (2006), is as follows:

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Identification of problems, discussion of problems between researchers and those under study, reviewing libraries and problems, redefining problems, choosing change and evaluation methods, and implementing changes. This study's population was 13 classes with 400 students taking the Accounting Information System course at the Department of Accounting, State Polytechnic of Malang, East Java, Indonesia, with four lecturers. A qualitative research model in which data is collected from a questionnaire distributed to all students taking the Accounting Information System course. With the response rate for questionnaire returns of 390 students.

Steps in Discovery Learning (Shah, M, 2017)

The initial preparation step for the discovery learning method in SIA learning
  a. Determine learning objectives
  b. Identify the characteristics of students (initial abilities, interests, learning styles and so on)
  c. Choosing the subject matter
  d. Determine topics that students must learn inductively (from examples of generalizations)
  e. Develop learning materials in the form of examples, illustrations, assignments for students to learn
  f. Organizing learning topics from simple to complex, from concrete to abstract, or from iconic to symbolic enactive stages
  g. Assess the process and student learning outcomes of students.

Application Procedures for Discovery Learning Models (Shah, M, 2017)

1. Stimulation
    This stage begins with PBM activities in which the teacher asks questions, recommends reading books, and other learning activities that lead to problem-solving preparation. Its function is to provide conditions for learning interactions that can develop and assist students in exploring material. The teacher must master the techniques in providing stimulus to students to enable students to explore can be achieved.

2. Problem Statement
    In this stage, the teacher allows students to identify as many problem agendas as possible relevant to the subject matter. One of them is selected and formulated in the form of a hypothesis (temporary answers to problem questions).

3. Data Collection
    When the exploration takes place, the teacher also provides the opportunity for students to collect as much relevant information as possible to prove whether the hypothesis is true or not. Thus, students can collect various relevant information, read literature, observe objects, interview with resource persons, and conduct their own trials.

4. Data Processing
    Data processing is the activity of processing data and information that students have obtained through interviews, observation and interpretation. All information from reading, interviews, observations are all processed, randomized, classified, tabulated; even if necessary, it is calculated in a certain way and interpreted at a certain level of confidence.

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5. Verification

Students carry out careful examinations to prove whether or not the predetermined hypothesis is true with alternative findings linked to data processing results.

6. Generalization

At this stage, concluding can be used as general principles and applies to all the same events or problems, taking into account the results of the verification. Based on the results of the verification, the principles that underlie generalizations are formulated.

The steps in Project-based learning (Blumenfeld et al., (1996); Kamdi, (2007). Are:

1. Lecturers make teaching materials/textbooks for students to study.
2. The lecturer makes a class learning plan, an outline of the learning program, and lecture program units.
3. Students form small groups to work on assignments/projects
4. Students are involved in the real world to work on projects/assignments given by the lecturer
5. Students make reports of projects that have been worked on
6. Assessing the results of the project-based learning report

RESULT AND DISCUSSION

The results of the application of traditional learning methods in the Accounting Information Systems course are:
Strongly agree with applying traditional learning methods as much as 15%, agree as much as 35%, neutral as much as 5%, disagree as much as 25%, and strongly disagree as much as 20% as in Table 1 and Figure1.

Tabel 1. Student Understanding Traditional Method

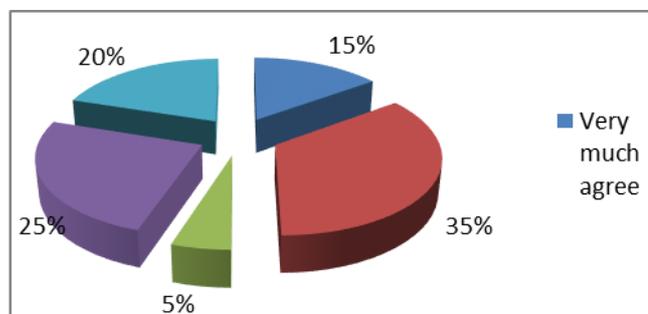| No	Criteria	%
1.	Very much agree	15
2.	Agree	35
3.	Uncertain	5
4.	Disagree	25
5.	Strongly disagree	20

Figure 1: Student Understanding Of Traditional Method

The results of the application of the Discovery method in learning Accounting Information Systems courses are:
Strongly agree with applying the discovery learning method as much as 40%, agree as much as 32.5%, neutral as much as 2.5%, disagree as much as 15%, and strongly disagree as much as 10% as in Table 2 and Figure 2.

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Tabel 2. Student Understanding Discovery Method

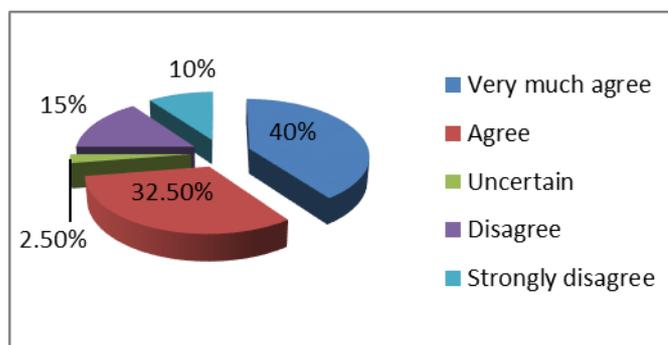| No	Criteria	%
1.	Very much agree	40
2.	Agree	32,5
3.	Uncertain	2,5
4.	Disagree	15
5.	Strongly disagree	10

Figure 2. Student Understanding Discovery Method

The results of the application of the Project-based learning method in learning the Accounting Information System course Strongly agree with the application of the project-based learning method by 45%, agree as much as 35%, neutral as much as 5%, disagree as much as 10% and strongly disagree as much as 5%. As in Table 3 and Figure 3.

Tabel 3. Students Understanding Project-Based Learning Method

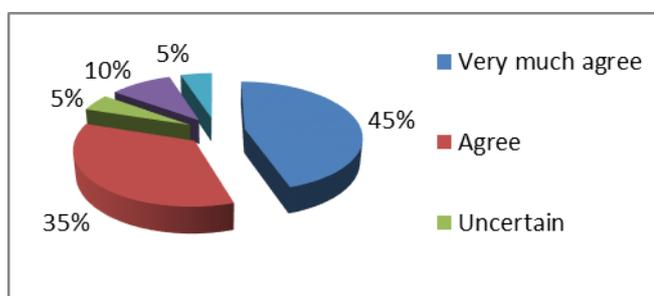| No	Criteria	%
1.	Very much agree	45
2.	Agree	35
3.	Uncertain	5
4.	Disagree	10
5	Strongly disagree	5

Figure 3. Students Understanding PBL Method

Student Achievement

Meanwhile, student achievement in the traditional learning method of Accounting Information Systems courses is A value of 20%, B + value of 30%, B value of 10%, C + value of 5%, C value of 20%, and D value of 15%. As in Table 4 and Figure 4.

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Tabel 4. Students Achievement Traditional Method

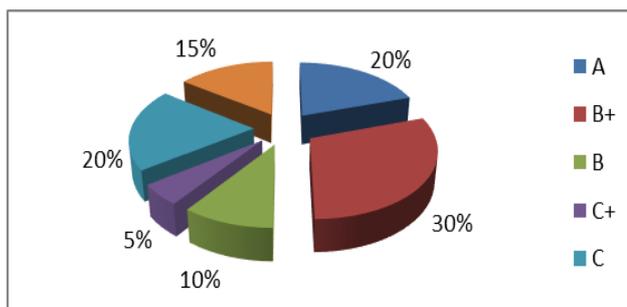| No	Criteria	%
1	A	20
2	B+	30
3	B	10
4	C+	5
5	C	20
6	D	15

Figure 4. Student Achievement of Traditional Method

Student achievement in the discovery learning method in the Accounting Information System course is an A value of 40%, a B + value of 30%, a B value of 20%, a C + value of 10%, a C value of 10% and a D value of 0, and Figure 5.

Tabel 5. Students Achievement Discovery Method

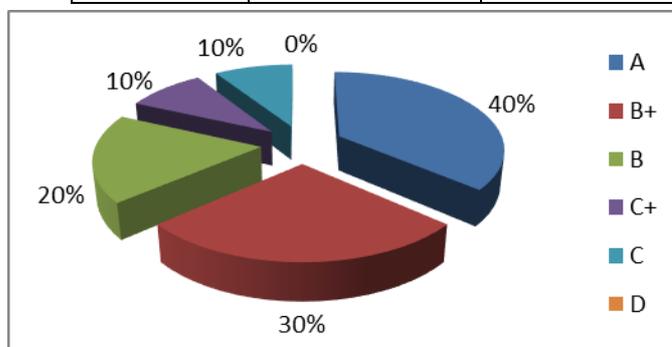| No	Criteria	%
1	A	40
2	B+	30
3	B	20
4	C+	10
5	C	10
6	D	0

Figure 5. Student Achievement of Discovery Method

Student achievement in the PBL learning method in the Accounting Information System course is an A value of 45%, a B + value of 35%, a B value of 10%, a C + value of 5%, and a C value of 5%. As in table 6 and Figure 6.

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Tabel 6. Student Achievement PBL Method

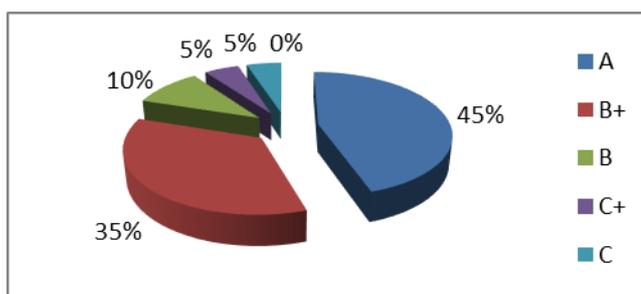| No	Criteria	%
1	A	45
2	B+	35
3	B	10
4	C+	5
5	C	5
6	D	0

Figure 6. Student Achievement of PBL Method

While the results of the application of the Discovery learning method in AIS learning, its effect on the learning effect is shown in the following figure:
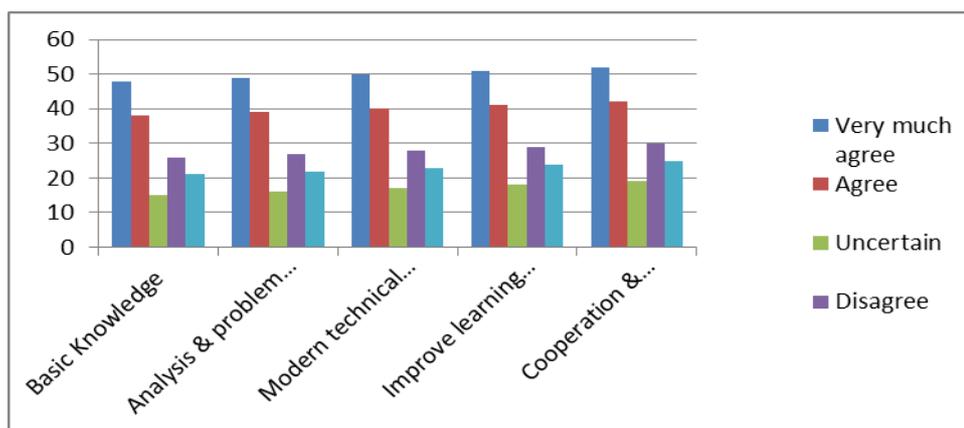

Figure 7. Discovery Learning Effect Survey Results

While the results of the application of the Project-based learning method in the AIS course, its effect on the learning effect is shown in the following figure:
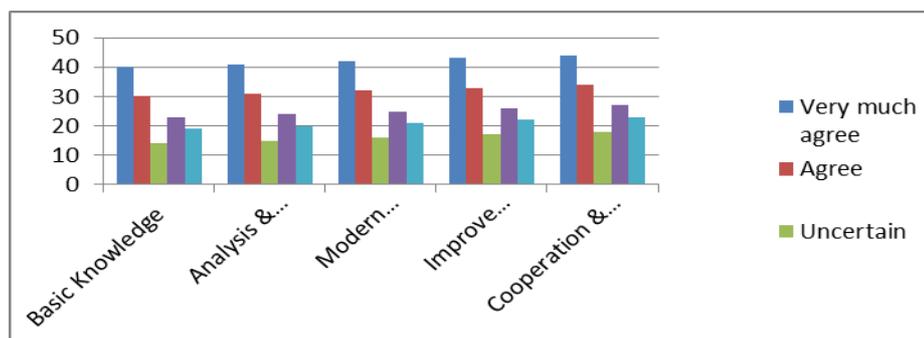

Figure 8. PBL Effect Survey Results

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CONCLUSION

Learning methods of discovery learning and project-based learning has been successfully applied to learning Accounting Information Systems in the Department of Accounting, State Polytechnic of Malang Indonesia and so that they can improve the competence, quality, and ability of students in understanding the concepts of theoretical knowledge and practice or skilled in solving problems and being able to communicate. With the environment or the real world.

LIMITATION

This research is limited to applying discovery learning methods and project-based learning in the Accounting Information System subject in the accounting department of State Polytechnic of Malang. It is hoped that further research will change other learning methods, such as problem-based learning.

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