IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

PROBLEM BASED LEARNING STRATEGIES DIFFERENCES USING THE INTERNET AND NOT USING THE INTERNET AGAINST STUDENT LEARNING ACHIEVEMENT

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ABTRACT

This study uses two learning models in implementing learning strategies, namely comparing problem-based learning strategies using the internet and not using the internet to determine the effect on student achievement. This research is a quantitative research in experimental form. Experiments were carried out on 4 classes of undergraduate sports coaching study program students at the PGRI Adi Buana University Surabaya. The research sample was taken randomly. For the experimental class, there were 43 students who would be treated with problem-based learning strategies using the internet, while for the control class there were 45 students who would be taught using problem-based learning strategies not using the internet. In applying the problem-based learning strategy, students are given materials that are oriented towards authentic problems associated with problems in a developing field.

To collect data to find out how much student learning achievement has improved, after the learning process lasts for 1 semester, students will be given test questions in the form of authentic problems that occur in the field which include all the material provided comprehensively. Before the learning process is carried out, students are given a post-test or pre-test.

The average post-test result with PBL learning strategies using the internet is 79.95 and PBL strategies not using the internet is 75.49. Thus, it means that the average post-test with PBL strategy using the internet is higher than post-test with PBL learning strategy using the internet.

Index Term: Problem Based Learning Strategy, Internet, Learning Achievement.

I. INTRODUCTION

The trend of globalization that is currently developing has been expressed according to Bukhopadhyay (1995), it should trigger conventional face-to-face education towards a more open education. Students need to be packaged according to the development of their knowledge so that later they will be able to work together, be able to take initiatives, think critically, and solve problems. Hope Shambaugh & Magliaro (2006) students can organize their knowledge in their memory and be able to solve problems and be able to develop their way of learning in real life. In line with this opinion Palmer (2001) also emphasized that superior learning and in accordance with the current learning paradigm can be packaged in the form of project-based learning, case-based learning, research-based learning, situation-based learning, inquiry-based learning, and problems in line with these Ardhana (2000) also emphasized that the knowledge age wants a learning paradigm that is oriented towards projects, problems, investigation, discovery and creation.

The problem-based learning (PBL) approach is an approach with a learning strategy that is directed at authentic problems experienced daily which invites students to think critically and skills in solving a problem, so that this learning method combines value processing theory and problem solving techniques to creating learning methods that emphasize the construction of knowledge and student-centered learning activities. The foundation of PBL learning is collaboration. This expression has been confirmed by Arends (2007) that PBL is posing various problems, asking questions and facilitating investigations and dialogue. Agreeing with this, Alder and Milne (1997) also emphasized that PBL is a method that focuses on identifying problems and compiling a framework for analysis and problems as well as preparing an analysis and solution framework. Peterson (2004) argues that this method provides students with problems that are not well structured and problem solving that is not one only because it focuses on self-learning and is very distant with direct explanations at the core and / or explanations directly by the teacher. Arends (2004) emphasizes that the essence of PBL is to present various problematic situations that are authentic and meaningful to students and which can serve as a stepping stone for investigation and investigation.

PBL is designed to empower students in learning, so that later students are able to think critically, learn independently, and solve contextual problems. PBL has advantages compared to other learning strategies, as revealed by Newby, et al. (2000) stated that PBL can increase understanding and recitation because students are required to solve daily problems and apply theory and practice, involve higher levels of learning, provide opportunities for learners to learn from mistakes, and build responsibility, so that students learn to think free. This is very important for students because students when facing problems in the field or in their daily lives can increase their independence in learning which will have implications for improving their learning outcomes.

PBL can also train students to practice problem solving, self-assessment, group skills, and communicate orally and in writing (Woods, 2000). In line with these thoughts Woods & Bayley (2006) stated that in PBL students learn subject knowledge and are simultaneously given the opportunity to develop skills in lifelong learning, problem solving, group work, communication, self-assessment, managing change, and critical thinking. Boud & Feletti (1997) argue that "problem-based learning is an approach to structuring the curriculum which involves confronting students with problems from practice which provise a stimulus for learning". White (2001) also argues that overall PBL is an effective method for improving problem-solving skills.

Several studies on PBL strategies have been carried out by Whitcher (2005) who concluded that with the PBL method students can build their own knowledge of what is experienced and think, and apply conceptions to different situations. Burris (2005) concluded in his research that with PBL students can improve their critical thinking skills, and there is a positive effect on understanding the content of knowledge. Anderson II (2007) on the acquisition / acceptance of knowledge, memory knowledge, and critical thinking skills, concluded that students who were given the PBL method had above average knowledge acquisition and this increased critical thinking.

PBL is often carried out in the context of a face-to-face learning process, on the other hand the Internet is a universal network, with various applications allowing for e-learning-based education to be held, thus opening opportunities for educational institutions to expand learning opportunities for anyone who meets the requirements. . Internet facilities should be used to consult on learning problems, assign assignments, feedback, exams, remediation for students, and create interactive service activities between lecturers-students and between students in enriching teaching materials for the benefit of lectures. However, in Indonesia PBL is rarely applied in a combination of internet-based learning processes. Thus, learning facilities via the internet can be used as a facility for procurement and enrichment of learning resources and learning media that are effective in implementing PBL learning strategies. However, in general, learning resources with an internet network system as presenters of lecture material in Higher Education are rarely

used by lecturers. Learning resources should be designed (by design) in the course, but in fact the course material is not designed based on the principles of learning technology (Patmanthara, 2005).

The internet as a medium which is expected to be part of a learning process, the developed internet will be able to provide support for the implementation of an interactive communication process between lecturers and students as required in a learning activity. Conditions that must be able to be supported by the internet are mainly related to the learning strategies to be developed, which, if described simply, can be interpreted as communication activities carried out to invite students to work on assignments and assist students in obtaining the knowledge needed in order to carry out tasks his duties (Boettcher 1999). Bishop's view (1989) has long previously revealed that future education will be flexible, open, and accessible to anyone. Mason (1994) also argues that future education will be more determined by networks, not school buildings. Bates (1995) states that technology can increase quality and reach if used wisely for education and training.

What if PBL is used in the internet world ?. PBL based on the internet is built through the principles of adult learning or independent learning, so that resources that can be accessed by students such as internet networks are needed. From the learner's side, as a basis for the implementation of learning well, students have mastered computer programs so that students will find it easier to obtain information to support the completion of tasks that must be completed. In addition, students are also expected to have e-mail as well as other applications that can facilitate themselves to communicate, collaborate both with their own fellow students and also with students.

PBL is not only designed to help lecturers convey large amounts of information to students, but PBL is designed to help students develop thinking skills, problem solving skills and intellectual skills, learn adult roles by experiencing them through real situations or simulated situations and become students. independent. From the results of their investigations, students in this learning end their orientation in the direction of making meaning to what they have found, so that it is hoped that students can construct their own facts about the facts they find. Through collaborative work with their groups, students will be able to work dynamically from the results they find authentically so that students will reach a higher level of understanding, further develop their learning and skills in shaping knowledge and also social skills (Rhem, 1998). In the PBL learning strategy, collaborative work is an important aspect because collaboration will help develop a learning community where students feel they can develop new ideas and raise questions about the material (Alen in White 2001). Furthermore, Cohen in White, (2001) states that collaborative work will be able to improve communication skills and the ability to manage groups dynamically and with collaboration will attract and motivate students because students are actively involved in work and have responsibility for student activities themselves.

PBL is a very interactive learning, because this learning is basically characterized by working in pairs or small groups to investigate confusing real-life problems. In general, the application of this method begins with a problem that must be solved by students. These problems can come from students or from learners. Problem solving is of course inseparable from the steps taken in the scientific method, thus the PBL learning method can provide an excellent learning experience to do scientific work on changes in student behavior.

Reigeluth (1999) provides guidance in developing a problem or project scenario which includes: (1) developing problems that are not clear and complex enough to encourage the development of critical thinking and problem-based skills; (2) authentic and relevant intercoperate problems; (3) create problems that ipotomize professional practice in the domain under study; and (4) using a new problem or addressing a significant current problem. Jonassen (2006) argues that learning to solve problems in the context of formal education is without exception using use cases. The case function according to Jonassen consists of five levels, namely: level 1 cased as exemplars / analogies, level 2 case as analogues (case-based rasoning), level 3 case-study method. Level 4 case as problem to solve, and level 5 student-constructed cased. Whereas Carrol & Rosson (2005) apply cases in class in four ways, namely: making specific homework which includes interaction with the case library, using case studies as a background for classroom activities, using case studies to demonstrate principles, practical-practice, concepts, and techniques are described in lectures and presentations, and use case studies as models for semester projects. In this study, researchers used and provided problems one week before lectures began, so that students could carry out information-seeking activities with their study groups or individually. In this study also, researchers used the PBL syntax adopted from Arends which includes five learning phases.

One thing that is very important to note is that posing a problem is not just asking “how” but also “why”. Therefore, in implementing PBL learning, it always follows the phases or syntax. There are many models in PBL learning with different syntax, but in principle they have similarities. Ramsay & Sorell (2006) suggests seven stages in PBL, namely (1) problem statement, (2) the question, (3) action plan, (4)

investigation, (5) revising the case and evaluating (revisiting the case evaluation), (6) the final product (final product), and (7) the final evaluation and feedback (final evaluation & feedback).

The difficulty in implementing PBL learning strategies, according to Little (1997) reveals that: changing the role of lecturers, student role conflicts, reactions of colleagues who do not use PBL, and maintaining team togetherness. Some Lecturers think that the application of PBL learning is too complicated and takes up a lot of study time so that the material that is expected to be mastered by students will not be covered / completed. This opinion, according to the researcher, does not need to be expressed because in the opinion of the researcher, by implementing the PBL learning strategy it will humanize students to be more independent. PBL will encourage students to collaborate and solve together about the assignments given. With PBL encouraging observation and dialogue with other parties so that students are gradually able to carry out the roles observed. PBL shows students in their own chosen research which allows students to interpret and explain various real-world phenomena and construct their own understanding of the phenomenon itself.

The internet according to Pian & Silveira (1996) can help generate or develop new values, reach large numbers of lecturers, and empower individuals and social groups. The role of the Internet is a tool or means of learning that is powerful because of its ability or potential that allows the community and lecturers to develop it globally (Munir, 2009). Cobine, (1997) (in Rusman et al, 2011) argues that the use of the internet as a learning medium conditions students to learn independently. "Through independent study, students become doers, as well as thinkers". Jonassen (1995) argues that technology has a role: as a tool for assessing information, presenting ideas and communicating with others; as a vehicle to articulate what students know, reflect on what they know, help think carefully; and as a means of connecting to present and stimulate real and meaningful problems, situations and contexts. Means & Olson (1993) suggest that electronic technology provides learning convenience for students, encourages lecturers to present curriculum, methods, materials, and assignments, provides motivation for students.

Through the internet, students can quickly access various literature and scientific references needed, so that it can simplify the process (Mukhtar & Iskandar, 2010). Thus the internet will provide opportunities for students to: increase access to information; collect, analyze, and organize information; communicating ideas and information; collaborating with others; solve the problem; and fostering cultural understanding (Munir, 2009). The use of the internet as a learning medium has several advantages: (1) it is possible for the distribution of education to all directions and the capacity of mentoring is not limited to classrooms, (2) the learning process is not limited by time as is face-to-face, (3) Students can choose topics or teaching materials according to the wishes and needs of each, (4) The length of time also depends on each student, (5) the accuracy and currentness of the learning material, and (6) learning can be carried out interactively, thus attracting students and enabling interested parties such as parents of students can also control the tasks that students do online (Rusman, 2011). In line with this opinion Mukhtar & Iskandar, (2010) also argue that the internet is useful in developing their profession because the internet can: (1) increase knowledge, (2) share resources among peers, (3) cooperate with overseas teachers, (4) the opportunity to publish information live, (5) organize regular communications, and participate in local and international forums. In addition, learners can use the internet as a source of teaching materials by accessing online learning plans or syllabuses with online methodologies, accessing course materials suitable for students, and being able to convey their ideas. The development of online technology in learning places a lot of emphasis on electronic couse (e-course), which means that the lecturer uploads material into the e-course and students learn online learning (Setyosari, 2006).

II. THEORETICAL FRAMEWORK

2.1. Problem Based Learning

Alder and Milne (1997) define PBL as a method that focuses on identifying problems and developing an analysis and solution framework. This method is done by forming small groups, a lot of cooperation and interaction, discussing things that are not or are not understood and sharing roles to carry out tasks and report to each other. According to Peterson (2004) this method provides students with problems that are not well structured and problem solving that is not only one because it focuses on self-learning and is very far from direct explanation to the core / answer / content and / or direct explanation. given by the lecturer. Wheeler, at al. (2005) stated that PBL learns based on thinking through real life problems. Boud & Feletti (1997) argue that "problem-based learning is an approach to structuring the curriculum which involves confronting students with problems from practice which provise a stimulus for learning". White (2001) also argues that overall PBL is an effective method for improving problem-solving skills. Wikipedia (2008) states that PBL learning is a learning strategy that emphasizes students to be able to solve problems

collaboratively and reflect on their experiences. PBL has characteristics: learning is controlled by open-ended problems, students learn in small groups, and lecturers act as facilitators.

If the researcher examines from this opinion that lecturers in PBL should be initiated by pointing out problematic situations to students and ordering students to investigate and find their own solutions, both individually and in collaboration with their small groups. Arends (2007) provides an overview that the essence of PBL is in presenting authentic and meaningful problem situations to students, which can serve as a stepping stone for investigation and investigation. Most importantly, the learner provides a scaffolding or support framework that promotes inquiry and intellectual growth. PBL will not happen, unless the lecturer creates an environment where an open and honest exchange of ideas can take place.

PBL is not only designed to assist lecturers in conveying large amounts of information to students but PBL is designed to help students develop thinking skills, problem solving skills and intellectual skills, learn adult roles by experiencing them through real situations or simulated situations and become independent student.

From the results of their investigations, students in this learning end their orientation in the direction of making meaning to what they have found, so that it is hoped that students can construct their own facts about the facts they find. Through collaborative work with their groups, students will be able to work dynamically from the results they find authentically so that students will reach a higher level of understanding, further develop their learning and skills in shaping their knowledge and social skills (Rhem, 1998). In the PBL learning strategy, collaborative work is an important aspect because collaboration will help develop a learning community where students feel more able to develop new ideas and raise questions about the material (Alen in White 2001). Furthermore, Cohen in White, (2001) states that collaborative work will be able to improve communication skills and the ability to manage groups dynamically and with collaboration will attract and motivate students because students are actively involved in work and have responsibility for student activities themselves.

Implementation of Problem-Based Learning in Learning

This problem-based learning is a very interactive learning, because this learning is basically characterized by working together in pairs or small groups to investigate confusing real-life problems. In general, the application of this method begins with a problem that must be solved by students. These problems can come from students or from lecturers. Problem solving is of course inseparable from the steps taken in the scientific method, thus the PBL learning method can provide an excellent learning experience to do scientific work in changing student behavior. Therefore, in the selection of the problem should provide a learning experience that characterizes the scientific method. Some of the obstacles in implementing the PBL method do not achieve the predetermined goals, this is often the problem raised is less broad, less relevant to the learning material and even deviates from the level of thinking of students.

Reigeluth (1999) suggests guidelines in developing project problems or scenarios which include: (1) develop problems that are ill-defined and appropriately complex to encourage development of critical thinking and problem-based skills; (2) intercoperate issues and problems that are authentic and relevant to users; (3) create problems that ipotomize professional practice I the domain being studied; and (4) use novel problems or ones address sifnificant, current problems. Jonassen (2006) argues that learning to solve problems in the context of formal education is without exception using use cases. The case function according to Jonassen consists of five levels, namely: level 1 cased as exemplars / analogies, level 2 case as analogues (case-based rasoning), level 3 case-study method. Level 4 case as problem to solve, and level 5 student-constructed cased. Whereas Carrol & Rosson (2005) apply cases in class in four ways, namely: making specific homework which includes interaction with the case library, using case studies as a background for classroom activities, using case studies to demonstrate principles, practical-practice, concepts, and techniques are described in lectures and presentations, and use case studies as models for semester projects. In this study, researchers used and provided problems one week before lectures began, so that students could carry out information-seeking activities with their study groups or individually. In this study also, researchers used the PBL syntax adopted from Arends which includes five learning phases.

One thing that is very important to note is that posing a problem is not just asking how but also why. Therefore, in implementing PBL learning, it always follows certain determined phases. There are many models in PBL learning with different syntax, but in principle they have similarities. Ramsay & Sorell (2006) suggests seven stages in PBL, namely (1) problem statement, (2) the question, (3) action plan, (4) investigation, (5) revising the case and evaluating (revisiting the case evaluation), (6) the final product (final product), and (7) the final evaluation and feedback (final evaluation & feedback). Arends (2004) details the syntax in implementing PBL, Arends argues that there are 5 syntax that needs to be done in implementing PBL learning, namely: (1) Providing orientation about the problem to students, (2) Organizing students to research, (3) Assisting independent investigations and groups, (4) developing and

presenting artifacts and exhibits, and (5) analyzing and evaluating the process of overcoming problems. In this study, researchers used Arends' steps and clearly these steps can be explained:

Giving orientation about the problem to students, the lecturer in this syntax explains the purpose of learning, builds a positive attitude towards learning and describes something that students are expected to do. No less important, the lecturer also explains in detail the process and model procedure, namely:

a. The main purpose of learning is not to learn new information but to investigate problems and to become independent of students.
b. The problem or question being investigated does not have an absolutely "right" answer and most complex problems have multiple, sometimes conflicting, solutions.
c. During the investigative learning syntax, students will be encouraged to ask questions and seek information. Lecturers will provide assistance, but students should work independently or with colleagues.
d. During the syntax of analysis and explanation of learning, students will be encouraged to express their ideas openly and freely. Here there are no ideas that are laughed at by either the lecturers or other students. All students are given the opportunity to contribute to the investigation and express their ideas.

To organize students to research, students are obliged to develop collaboration skills among students and assist them in investigating problems collectively. Students also help students plan their investigative and reporting assignments.

Helping Independent and Group Investigations, the essence of PBL is how students can carry out investigations that are carried out independently, in pairs or in small groups. Although each problem situation requires somewhat different investigative techniques, most involve the process of gathering data, experimenting, hypothesizing and explaining, and providing solutions.

Development and Presentation of Artifacts and Exhibits, This syntax is followed by making artifacts and exhibits. Artifacts are more than just written reports, such as video recordings showing problematic situations and proposed solutions, models that include physical representations of a problem and its solution, and computer programs and multimedia presentations. Sophistication of artifacts should pay attention to the characteristics of learners (age and ability). Whereas Exhibits can be in the form of traditional science messages, where each student can display their work to be observed and assessed by others or a verbal or visual presentation that exchanges ideas and feedback.

Analyzing and Evaluating the Problem Solving Process. In this system, the lecturer asks students to reconstruct their thoughts and activities during various learning syntaxes, when do students get a clear understanding of the problematic situation ?, When do students feel certain solutions? when compared to others ?, why do students reject the explanation ?, why do students adopt the final solution ?, do students change their mind about the problematic situation during the investigation process ?, what causes these changes ?, and what will students do in a way different in the future ?.

The difficulty in implementing PBL strategy, according to Little (1997) revealed that: changing the role of lecturers, student role conflicts, reactions of colleagues who do not use PBL, and maintaining team togetherness. Several lecturers thought that the application of PBL was too complicated and took up a lot of study time so that the material that was expected to be mastered by students would not be covered / completed. This opinion, according to the researcher, does not need to be expressed because in the opinion of researchers, by implementing PBL learning strategies, students will be more human to be more independent. PBL will encourage students to collaborate and solve together about the assignments given. With PBL encouraging observation and dialogue with other parties so that students are gradually able to carry out the roles observed. PBL shows students in their own chosen research which allows students to interpret and explain various real-world phenomena and construct their own understanding of the phenomena themselves.

Arends (2004) found that PBL tries to help students to become independent and self-regulated students. Guided by a lecturer who always gives enthusiasm and rewards when students ask questions and find their own solutions to various real problems, students will learn to carry out their assignments independently.

Therefore, in implementing the PBL learning strategy, things that need to be considered according to Delisle (1997) suggest that the important elements of PBL problems are simplicity, clarity, consistency, and communication.

Infrastructure and Learning Resources in Applying Problem-Based Learning Strategies

Before carrying out lectures with the PBL strategy, more intensive preparation is needed. In lectures with the PBL strategy, there are three components that will work, namely (1) Institutions, (2) Lecturers, and (3) Students. These three components work according to their respective roles or assignments to achieve optimal learning in PBL courses. Institutions are universities as places in the learning process. This

institution will support the implementation of the learning process, such as: (1) preparing lecture facilities, libraries and laboratories, (2) ensuring the implementation of lectures by replacing courses that are not held and if necessary forming a team of lecturers for courses, (3) providing lecture assistants, (4) prepare computer network facilities, and (5) record lecture attendance in a database so that the information can be used for evaluation of the implementation of courses to be implemented.

In PBL, the role of the lecturer is as a facilitator and build a learning community. The role of the lecturer is:

a. Prepare scenarios that will be discussed in each session and arrange the course syllabus in the format of the semester learning activity program plan. The number of sessions is adjusted to the material coverage, output, and outcome of the lecture.
b. Gradually prepare lecture materials in the form of electronic files and provide several sources, including reference books and website links.
c. Encourage students to explore the next required knowledge. Lecturers are generally expected to refrain from providing information, but to encourage discussion and learning between students.
d. As an evaluator. Although the role of learning is no longer dominant in the implementation of lectures, lecturers are still fully responsible for the success of the implementation and achievement of lecture objectives. Therefore, on an ongoing basis, lecturers need to evaluate the implementation of lectures and make immediate improvements if needed, both in terms of content and process.

2.2. Internet

The era of technology in learning has come which is expected to help students understand the expected material / competencies. An educational technology expert in the 1960s, namely Fred S. Keller (in Mukhtar & Iskandar, 2010) criticized the application of conventional learning methods that did not attract the attention of students, according to Keller, students should be given wider access in determining what they want. they learn according to their interests, needs, and abilities. It is also said that learning is not the only holder of knowledge authority in the classroom. students must be given independent learning by utilizing various learning resources.

The demands for effective and efficient learning are expected in complete mastery. Various terms are used to express opinions / ideas about electronic learning, including: on-line learning, internet-enabled learning, virtual learning, or web-based learning. In this connection, what is needed is clarity about what learning activities can be called e-Learning? Can someone who uses a computer in their learning activities and accesses various information (learning materials) from the Internet, can be said to have done e-Learning?

Internet, which stands for Interconnection and Networking, is a global information network, namely "The Larges global network of computers, that enables people throughout the world to connect globally with each other" (Rusman et al, 2011). The internet is a network that connects most computers in the world into a network. Internet coverage area is the largest than any other network. The internet is a network created and patented by the Xerox company (Daryanto, 2010). The existence of up to date information is the essence of the success of the world of education. The development of computer and telecommunication technology has enabled very cheap internet computer networks. In Indonesia there are dozens of universities with potential internet users with millions of users, but the irony in Indonesia still needs to justify how the world of higher education is linked to the internet, while our colleagues in other countries have started programs linking secondary schools and even elementary schools to the internet.

The internet according to Pian & Silveira (1996) can help generate or develop new values, reach large numbers of lecturers, and empower individuals and social groups. The role of the Internet is a tool or means of learning that is powerful because of its ability or potential that allows the development of global society and learners (Munir, 2009). Cobine, (1997) (in Rusman et al., 2011) suggests that the use of the internet as a learning medium conditions students to learn independently. "Through independent study, students become doers, as well as thinkers". Jonassen (1995) argues that technology has a role: as a tool for assessing information, presenting ideas and communicating with others; as a vehicle for articulating what students know, reflecting on what they know, helping to think carefully; and as a means of connecting to present and stimulate real and meaningful problems, situations and contexts. Means & Olson (1993) argues that electronic technology provides learning convenience for students, encourages lecturers to present curriculum, methods, materials, and assignments, provides motivation for students.

With the existence of the internet, it will certainly make it easier for students to take materials, study individually, collaborate in groups and with lecturers, meaning that with this technology students can make it easier to carry out activities in their learning. So that it will be an opportunity for students to be able to improve their abilities and mastery in increasing their learning achievement. Several studies that have been

carried out related to the use of the internet have been widely proven, as has been done by Cotton (1991) who has conducted a study of computer-assisted learning, it is found that computer-assisted learning increases the acquisition of high learning outcomes. Heinich, at al. (2002) who conducted research on innovative learning techniques that focused on questioning techniques on text, advance organizers, and the media specifically showed the progress of learning outcomes.

Through the internet, students can quickly access various literature and scientific references needed, so that it can simplify the process (Mukhtar & Iskandar, 2010). Thus the internet will provide opportunities for students to: increase access to information; collect, analyze, and organize information; communicating ideas and information; collaborating with others; solve the problem; and fostering cultural understanding (Munir, 2009). The use of the internet as a learning medium has several advantages: (1) it is possible to have the distribution of education to all directions and the capacity of mentoring is not limited to classrooms, (2) the learning process is not limited to time as is face-to-face, (3) learning can choose topics or teaching materials according to the wishes and needs of each, (4) The length of time also depends on each student, (5) the accuracy and currentness of the learning material, and (6) learning can be carried out interactively, so as to attract learners and enable interested parties such as parents of students can also control assignments that students do online (Rusman, 2011). In line with this opinion Mukhtar & Iskandar, (2010) also argue that the internet is useful in developing their profession because the internet can: (1) increase knowledge, (2) share resources among peers, (3) cooperate with overseas teachers, (4) the opportunity to publish information live, (5) organize regular communications, and participate in local and international forums. In addition, learners can use the internet as a source of teaching materials by accessing learning plans or online syllabi with online methodologies, accessing course materials suitable for learners, and being able to convey their ideas.

At least three important things can be drawn as requirements for electronic learning activities (internet), namely: (a) Learning activities are carried out through the use of networks ("networks" in this description are limited to internet use. Networks may include LAN (Local Area Network) or WAN (Wide Area Network), (b) Availability of learning support services that can be used by learning participants, for example CD-ROMs, or printed materials, and (c) Availability of tutor support services that can help participants learn when experiencing difficulties. The three requirements above can still be added to other requirements, such as: (a) institutions that organize / manage e-learning activities, (b) positive attitudes of students and education personnel towards computer and internet technology, (c) design of learning systems that can be learned / known by each learning participant, (d) an evaluation system of the progress or development of learning of bell participants teaching, and (e) a feedback mechanism developed by the organizing agency.

Thus, in simple terms it can be said that electronic learning is a learning activity that utilizes networks (Internet, LAN, WAN) as a method of delivery, interaction, and facilities and is supported by various other forms of learning services.

The development of online technology in learning places a lot of emphasis on electronic couse (e-course), meaning that learners upload material into e-courses and learners learn online learning (Setyosari, 2006). The concept of learning can not only help learners to learn, but more than that how the learning process can take place effectively which emphasizes the learning process as a personal process with learning strategies that can accommodate various contexts, content sets that should be taught. Of course, in this process students will be able to build their own personal knowledge and experience, such a process is certainly in line with a constructivist view. The constructivist view leads to a learning approach that provides opportunities for learners to find concrete and contextually meaningful experiences, find their own problems, construct their own ways, understandings and strategies (Fosnot, 1996).

Dabbagh (2005) describes an online learning implementation model through three components as its main characteristics, namely: a pedagogical or construct model; learning and learning strategies; and the learning technology used. So, referring to this model, in developing an online learning system, the steps that must be taken are: First, first formulate and decide what kind of education model you want? Do you want to carry out open / flexible learning (open / flexible learning), distributed learning, learning communities, or asynchronous learning networks. The second step, formulating or determining what learning strategy will be? what learning strategy model is most relevant to the learning model specified above. Will you use a collaborative learning strategy model, problem solving, reflection, role playing, games, and so on? Referring to the example above, because the learning model to be used has been determined, namely the learning community for lecturers, relevant learning strategies include discussion, problem solving and reflection or sharing of experiences, the lecturer raises problems (posts) as a result of group discussions without internet assistance to which other lecturers will respond. Or conventional results in the form of examples of syllabus, lesson plans and others are shared to be observed and applied by other learners. The

third step, determine the relevant technology! whether it is appropriate to use synchronous or asynchronous communication tools, hypermedia and / or multimedia, web authoring tools or course management systems. Referring to the case above, the technology is right for the learning community model where the learning strategy is only discussion, problem solving and sharing of experiences. It is enough to use a content management system, you don't need to have to use a course management system such as Dokeos, Moodle, Atutor and so on.

In this study, the researcher applied PBL learning strategies by taking rocks with the internet. In the application of this method, given the characteristics and abilities of students, the researcher begins with limited internet-assisted learning on taking teaching materials, searching for materials or information needed to solve problems / tasks that must be done by groups or individuals, collaboration / question and answer between learners. da learners via e-mail or chat about things that have not been understood in the completion of their assignments. Tasks that have been completed by creating reports (portfolios) are collected and sent via email and given feedback also via email, either individually or in groups. Concrete discussion will be discussed during a meeting with learners during lectures with discussion.

2.3. Learning achievement

Learning achievement has an understanding of the abilities possessed by students as a result of learning behavior which can be observed through student performance (Gagne, 1979). Raiser (in Djamaah, 2000) also argues that learning achievement is an ability that students have as a result of learning activities. Learning outcomes are a result that can be used as indicators of determining value for students from using learning methods under different conditions such as learning achievement, effectiveness, efficiency, attractiveness, retention, attitude, problem-solving skills and so on.

Hornby (2000) states that achievement is "a thing that samebody has done successfully, especially using their own effort and skill" meaning that learning achievement is the level of mastery of knowledge and skills in certain subjects. Achievement has a multidimensional sense related to individual development such as emotional development, social physical change, cognitive development which is a reflection of the overall development of an individual which is not only related to an event but across individual life. Achievement (achievement) includes ability (ability) and performance (performance) (Steinberger, in Basuki, 2004).

In this study, the researcher wanted to find out about students' learning achievement as a result of the PBL learning strategy using the internet by comparing the use of PBL learning strategies not using the internet. Student achievement is taken by student progress which is called post-test after students carry out learning activities for eight meetings.

Learning achievement is the level of student mastery of certain learning materials that have been studied in the learning process. In this research, which is measured to determine the increase in student achievement in the field / subject of learning and learning and the subjects provided include the nature of learning and learning, learning principles and learning principles, learning motivation, learning approaches, and problems. study. To measure learning achievement is limited to the ability of students in cognitive strategies, intellectual abilities and the ability to inform the findings of the task (verbal information).

In this study, researchers raised students' learning achievement from post-test which was carried out after students received learning material from module one to module five. Previously, to find out whether there was progress in understanding at the end of the material that had been determined by the researcher, the researcher conducted a pre-test for students before all learning material was given to students.

Competencies that will be mastered by students include the nature of learning and learning, learning principles and learning principles, learning motivation, learning approaches, and learning problems. The competencies expected in this study are included in the cognitive domain. In achieving the level of learning achievement there are many factors that can affect learning achievement, such as student internal factors which include intelligence / intelligence, motivation, learning style, cognitive style and so on. External factors which include lecturers, the environment, facilities and infrastructure, the learning strategies used, the curriculum and so on. Therefore, in this study, several factors will be examined that focus on PBL learning strategies using the internet and not using the internet to find their effects on student learning achievement.

III. RESEARCH METHODS

The implementation of this research was carried out in several steps before conducting the experiment. The stages carried out by researchers are first, conducting an assessment of the learning process on the use of learning strategies and student achievement, second, making learning tools, including developing teaching materials, lecture instructions, learning scenarios, test instruments, and making lecturers' blogs to

embed all material information. videos, articles and so on that are needed by students in taking part in lectures, third, making lecture settings from how lectures are conducted, conducting midterm exams and final semester exams.

In this study, the study was conducted using 2 lecture settings as a form of experiment, the first group was the experimental group, namely the group of students who were taught using PBL strategy using the internet and the second group was the control group, namely the group of students who were taught using the PBL strategy without using the internet. The learning process is carried out in 1 semester with 16 meetings with details, 14 lecture meetings, 1 midterm exam, and 1 final semester exam.

The material that will be given to students, researchers compile the material in the form of teaching material books which will be uploaded to the lecturers' blogs that have been made. Teaching materials are developed by fulfilling the principles of developing teaching materials, in this case the researcher uses the development of the Dick and Carey (2001) model. The validity of the developed teaching materials is tested by involving design experts and internet experts. After expert validation is carried out and it can be declared fit for use in the learning process, the researcher uploads it to the blog that has been provided.

3.1. Population and Sample.

This research was conducted in one university, namely PGRI Adi Buana University Surabaya in 5 classes of sports coaching education (S1) with the number of each class varying with the number between 40-50 students per class. The number of population was 223. The research sample was taken by random sampling with details: the experimental group numbered 43 and as a control group with a total of 45. These groups would be used as class A as the experimental group and class B as the control group.

3.2. Data and Data Sources

From the initial data from conducting the assessment, it has been obtained from a questionnaire and documentation with the following explanation:

- From the use of learning strategies given by each lecturer, it is very diverse, from the use of inquiry learning strategies, collaboration, discussion, practice, field trips and the most part is the lecture method with conventional power point presentation. The lecturers did not yet use PBL strategies, let alone internet-based strategies.
- From the student's learning achievement obtained from the previous year, the average student learning achievement can be categorized as low and tends to be very low. Variety of student learning achievement mostly has medium to lower learning achievement and a few outstanding student achievement.
- The use of lecturers' blogs as internet facilities is not widely used by lecturers to facilitate the presentation of information or teaching materials to be delivered.

Sources of data data to support this research, researchers used other lecturers to be given an explanation of how the learning process using the PBL strategy using the internet was carried out. To collect data on how the progress of student learning achievement is done by doing pre-test and post-test after and before the learning process takes place. Students in face-to-face meetings do presentations and discussions of the results of assignments given as responsibility for completing assignments in groups. Students are only given material that is broad in nature and students are asked to download material, assignments, and other reading materials that have been uploaded on the lecturer's blog. Students in completing their assignments are encouraged to look for other learning resources as material for completing the assignments given and the results are collected via e-mail and other applications in addition to being printed for accountability in presetation while staying face to face with the lecturer.

To collect data on the progress of student learning achievement, a comprehensive final exam is carried out from the start to the end meeting. In the test, students are given 8 questions in the form of authentic problems which cover meeting material from start to finish.

3.3. Data Analysis and Statistical Analysis

The grading of the results obtained by students is carried out comprehensively from the work done on the assignments and exams that have been carried out. To determine the assessment of researchers based on the rubric with a score category of 1 to 5. The results obtained from learning achievement between pre-test and post-test will be processed by using 1-way variant analysis statistics to determine differences and progress in learning achievement of each student. The maximum score of each test item is 5, thus the total score for the 8 test items is 5 x 8 = 40. Furthermore, the score obtained is to determine the value of student

learning achievement, the maximum score is multiplied by 100. For the assumption of parameter normality test and homogeneity test between group using SPSS 20.0 for Windows.

IV. RESULTS AND DISCUSSION

RESULTS

Pre-test results Students who were given learning treatment with PBL-internet learning strategies and PBL learning strategies without internet used statistical techniques of independent two-sample t test. This test was conducted by researchers to determine whether the two treatment groups had equality or not. The results of the analysis carried out are the resulting data as described in table 1 below:

Table 1: The t-test statistics of Prates

	PBL	N	Mean	Std. Deviation	Std. Error Mean
PRATES	PBL-Internet	43	34,74	8,083	1,233
	PBL Tanpa Internet	45	32,33	8,660	1,291

Table 1 shows the mean pre-test score of students in the PBL-internet class, namely mean = 34.74 and Standard Deviation = 8.083, which is greater than the average pretest score for PBL class without internet, mean = 32.33 and Standard Deviation = 8.660.

To find out the pretest results of the two treatment groups are different or not significantly different, it can be done by analyzing the pre-test results of the two groups with t-test statistical analysis of the independent sample. The results of the t test analysis of the two independent samples are shown in table 2 below:

Table 2: The t-test output of the Prates

		t-test for Equality of Means			
		t	Sig. (2-tailed)	Mean Difference	Std. Error Difference
PRATES	Equal variances assumed	1,348	,181	2,411	1,788
	Equal variances not assumed	1,351	,180	2,411	1,785

From Table 2 it is found that the probability value of the t-test for equality of means is 0.181 (greater than 0.05), so the null hypothesis which states that there is no difference in the mean value between the two groups is accepted, this means that the two classes have equal abilities .

Pre-test results of students who were given learning treatment with PBL-internet learning strategies and PBL learning strategies without internet were analyzed using statistical techniques of two independent samples t test. This test was conducted by researchers to determine whether the two treatment groups had equality or not. From the results of the analysis carried out, the data is generated as described in table 3 below:

Table 3: The t-test statistics of Prates

	PBL	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
PRATES	PBL-Internet	43	34,74	8,083	1,233
	PBL Tanpa Internet	45	32,33	8,660	1,291

Table 3 explains that the mean results of the pre-test scores of students in the PBL-internet class, namely mean = 34.74 and Standard Deviation = 8.083, are greater than the average pretest scores for PBL class without internet mean = 32.33 and Standard Deviation = 8.660. To find out the pretest results of the two treatment groups are different or not significantly different, it can be done by analyzing the pre-test results of the two groups with t-test statistical analysis of the independent sample. The results of the t test analysis of the two independent samples are shown in table 4 below:

Table 4: The t-test output of the Prates

		t-test for Equality of Means			
		t	Sig.(2-tailed)	Mean Difference	Std. Error Difference
PRATES	Equal variances assumed	1,348	,181	2,411	1,788
	Equal variances not assumed	1,351	,180	2,411	1,785

Table 4 shows that the t-test probability value for equality of means is 0.181 (greater than 0.05), so that the null hypothesis which states that there is no difference in the mean value between the two groups is accepted, this means that the two classes have equal abilities. The total average post-test score of students

who were treated with PBL-internet learning strategies (mean = 79.95 and standard deviation = 6.233) was greater than the average post-test score of students who were treated with PBL strategies without internet (mean = 75 , 49 and standard deviation = 6,868).

This normality test aims to test the normality of the data distribution. The data normality test was carried out according to the data grouping based on the results of the pre-test and post-test in the two groups of students who were given the PBL-internet strategy and students who were given the PBL strategy without internet. Table 5 below

Table 5: Post-test Data Normality Test Results

NPar Tests

One-Sample Kolmogorov-Smirnov Test

		PASCATES
N		88
Normal Parameters[a,b]	Mean	77,67
	Std. Deviation	9,363
Most Extreme Differences	Absolute	,132
	Positive	,080
	Negative	-,132
Kolmogorov-Smirnov Z		1,241
Asymp. Sig. (2-tailed)		,092

a. Test distribution is Normal.

b. Calculated from data.

The significance level or the probability value of the Kolmogorov-Smirnov post-test probability value is 0.92. The value of the post-test significance level is greater than 0.05, therefore it can be concluded that the post-test data distribution is normal. The data homogeneity test was carried out to determine whether the variance values in the sample groups were homogeneous. The results of the data homogeneity test used the Levene statistical test.

Table 6: Results of Data Homogeneity Test with Levene's Test

Oneway

Test of Homogeneity of Variances

Prestasi Belajar

Levene Statistic	df1	df2	Sig.
1,553	1	86	,216

The resulting probability value is 0.216 (greater than 0.05) so that the null hypothesis which states "there is no difference in variance in the sample group" is accepted. This means that the variance value in the sample groups is homogeneous.

Hypothesis testing shows that the F value is 7.685 and the learning strategy probability value is 0.007 <0.05, so that the null hypothesis is rejected, thus there is a difference in learning achievement between students who are given PBL-internet strategy and students who are given PBL learning strategies without internet. The average post-test result for students who were given learning with PBL-internet learning strategy was 79.95 and students who were given learning with PBL strategy without internet was 75.49. Thus, it means that the average post-test with the PBL-internet strategy is higher than that of the post-test with the PBL-without Internet learning strategy, meaning that the application of learning with PBL-internet learning strategies has a better effect on student achievement compared to the application of learning with learning strategies. PBL without internet.

DISCUSSION

The results of the hypothesis test show that there are differences in learning achievement between the group treated with the PBL-internet strategy and the PBL strategy group without the internet. The total average score of learning achievement in the application of the PBL-internet strategy is higher than the average total score of learning achievement in the application of the PBL strategy without internet.

PBL is designed to develop thinking, problem solving, intellectual skills, learn to act like an adult through real or simulated situations and become independent learning (Arends, 2004). PBL is a learning approach that emphasizes the use of real life problems in education. Wood, (2000); Woods & Bayley, (2006) argues that in PBL activities, students have the opportunity to practice problem solving, self-assessment, group skills, communication skills, change management and critical thinking.

So that the PBL strategy really gives students the opportunity to be active in solving real problems and is carried out in groups or individually, so that it is clear that students not only receive material or simply

memorize material, but learning puts forward the learning process so that learning is more meaningful. Joyce & Weil, (1986) argue that there is a weakness in learning that emphasizes the product (content based) and ignores the process, even though understanding of the product is not usually achieved without understanding the process of obtaining it.

The findings of research that have been conducted are Cotton (1991) who has conducted a study of computer-assisted learning, it is found that computer-assisted learning increases the acquisition of high learning outcomes. Smaldino (2002) who conducted research on innovative learning techniques that focused on questioning techniques on text, advance organizers, and media specifically showed the progress of learning outcomes. Knapp & Glenn (1996) suggested why students prefer the use of technology (computers) and prefer to follow learning using computers. Furthermore, Knapp & Glenn argued that the general role of technology is to provide information, develop knowledge and skills and connect with different places. Another study by Hazwanie H at.al (2017): Online chat applications thus expand the usefulness of PBL, and its use adds to the accessibility, flexibility and convenience that students expect from higher education in the digital age, Lamria Tambunan at.al. (2018): The use of integrated learning model Problem Based Learning E-Learning affects learning outcomes, Geoff Wong at.al. (2010): Their Internet-based courses will be considered useful and provide effective learning opportunities, Siti Azizaha at.al. (2017): Student learning activities using problem-based internet media have increased at each meeting and its indicators, Manwa L. at.al. (2013): All participating students enjoy online PBL, without any perceived negative effects on learning. Online PBL unanimously saves student travel time to and from school. Thus the use of the internet in the use of PBL learning strategies shows various abilities that have increased significantly.

Statham and Torell, 1996 (in Sukirno, 1999) found that the application of cognitive theory has been able to develop the concept of learning more openly and in its application there has been an increase in the interaction between lecturers and students, the creation of joint learning activities, problems and the occurrence of the discovery process, as a result of learning. in computer-based education based on cognitive theory. Computer technology devices are used to strengthen, expand, and enhance human cognition. Computers can help humans to access materials and sources of information and help learners to store, repeat and analyze information. Students are nurtured to be able to test hypotheses with the result that the necessary knowledge can be used more effectively. Computers are used to unlock students' thinking patterns and skills and to a minimum are used to use in repetition patterns. This explanation can add to the convincing researchers that the use of internet-assisted media is in line with the strategies applied in PBL learning.

A number of other studies have shown that computer-assisted technology with a cognitive approach will increase the chances of learners to be more biased in choosing and controlling their learning activities and changing and developing self-confidence to a higher level. On the other hand, Lecturers use data to diagnose and seek to improve student learning achievement to reach the expected level (Patmanthara, 2005). The results of research in the United States on the effectiveness of the use of information technology in education show that the use of information technology compared to instructional technology is more profitable in terms of 30% saving time, 30-40% saving costs and further improving student achievement (Pavlik, 1996). A study conducted by the Center for Applied Special Technology (in Anwas, 2003) resulted in that it was carried out on about 500 fifth and sixth grade students of elementary schools. The number of students was divided into two groups, namely the experimental group whose learning activities were equipped with internet access and the control group. The results after two months found that the experimental group got higher scores based on the final test results. Sutjipto (2003) in his research on learning methods applied at the elementary school level gives the highest average effect. The use of structure in free experiments in delivering subject matter turns out to provide a high average effect. The learning method applied in the field of Indonesian studies shows a high average effect. Nuraini (2003), the results of research conducted in ITB students, found that students' enthusiasm for learning had increased significantly and their motivation and ability to absorb subjects obtained satisfactory results.

The research findings in implementing PBL learning strategies show that Hidayati, at.al. (2020): There is a significant relationship between student communication and collaboration skills and student cognitive learning outcomes using the DMM-Integrated PBL model, Mahardika, at.al. (2017): Fluid dynamic learning based on RVM (Verbal and Mathematical Representation) assisted by worksheets with PBL (Problem Based Learning) settings can increase student activity and student learning outcomes, Dwi Oktaviani Ogara, at.al. (2019): The economic learning outcomes of students who learn using the PBL learning model are higher than the economic learning outcomes of students who learn using the TAI learning model, Heru Raharjo, at.al. (2018): The learning outcomes of students taught with PBL were higher compared to students taught with Direct Teaching and they differed significantly, Naicheng, at.al. (2020): There is a very real increase in the PBL learning process in the aspects of reliable leadership and group collaboration learning in

mixed groups, Miftahus Surur, at.al. (2020): There are significant differences in problem solving abilities between students who learn to use problem-based learning and direct learning.

The research findings support this research. The researcher argues from the research findings that PBL learning strategies, which mostly have a higher achievement increase compared to other conventional learning strategies, will be more meaningful when followed by learning based on internet media. From the research findings, which also received a good response for students, namely the achievements obtained were very significant compared to students who were not conventionally equipped with internet media. Therefore, rationally and the results of this study about PBL-internet strategy can be increased significantly.

V. CONCLUSION

The group that used the problem-based learning-internet learning strategy had higher learning achievement than the group that used the problem-based learning strategy without the internet.

VI. THANK-YOU NOTE

Thank you to the Chancellor of the University of PGRI Adi Buana Surabaya, Head of the Sports Coaching Education Study Program, Lecturers involved in the learning process, experts, students, fellow lecturers who helped in the implementation of this research as well as administrative and academic staff who have helped in smoothing this research.

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