

Active learning with research based on three principles of higher education

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ABSTRACT

This study aims to determine how using an active learning model based on the three higher education principles can improve students' active learning. Qualitative research methods were applied in this study, with data collection through interviews, literature study, and observation. The results showed that active learning based on the three higher education principles was included in the "good" or "acceptable" category. The application of this model can make this campus a place with a positive academic atmosphere that enhances and supports collaboration, discussion, and positive and critical thinking. The novelty of this research lies in the use of active learning with mini-research projects, which are developed based on university principles and embody it. The hope is that this can help solve problems in the student learning process at the State Islamic University Sunan Kalijaga, Yogyakarta, Indonesia. The expected implication is that the university's policy supports applying the model to resolve learning problems and build real scientists for students.

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1. INTRODUCTION

The Islamic State University Sunan Kalijaga of Yogyakarta has ambitious plans to develop university education and research quality further. The university aims to fulfill world-class standards of teaching and research. Therefore, the number of master's and Ph.D. students will be raised in the coming years. Students need to be prepared to do scientific research and publish the results of that research in international scientific journals in English. On its way to this goal, the university has already achieved remarkable successes, such as follows. This campus has a positive academic atmosphere that enhances and supports cooperation, discussion, and critical thinking. The students are used to giving professional presentations using professional media. Students are used to having open and vital conversations. Some lecturers give their students the possibility to work and discuss independently in groups, researching independently and producing "products" such as books and online presentations of the result of their work. Thus making use of important elements of project-based learning.

On the other hand, students could benefit from a more professional use of up-to-date teaching and learning methods. Methods to study more effectively could also be used by the students in later jobs, as school teachers, and in many other professions, especially if they run their businesses (Society 5.0). For last teachers, the lecturers could be a role model for good teaching. The teaching methods they use could set a good example for good education. Also, the quality of presentations in seminars could be improved. Many students do not address the audience of students in their presentations. So often, students get bored and are not learning from the display. Usually, feedback on the shows is not given.

The paradigms of learning and teaching are changing – worldwide. Today, teachers and scientists worldwide know that successful learning has nothing to do with the amount of subject matter [1]. Of course, there is a basic knowledge of the subject matter that all students must know to be able, for example, to do independent research. Nowadays, many basic understandings can be acquired through individual and cooperative learning using books and Internet resources [2]. A learning process starts after learning and understanding some basic knowledge. If the subject matter becomes too much, there is no time or way to create a personal learning process. The problem of too much subject matter exists worldwide, both in schools and in universities. The reason is that teachers and lecturers often feel an “urge” to teach and believe students need to be prepared. The problem is that students - in schools and universities - soon get bored and cannot start their learning process. Often, students don’t even understand what they are taught. Today, we know effective and successful learning is impossible when learners are only being taught and “filled up” with huge amounts of subject matter. Students who feel filled with lots of subject matter will never be “hungry” for learning [3]. This is why the learning and teaching paradigms are changing – worldwide [4].

They are changing from subject-matter-oriented learning to competence-oriented learning. Learning competencies are more than learning knowledge [5]. First, learners can use the acquired knowledge in a real situation. For example, you not only know a foreign language's vocabulary and grammar rules, but you can also communicate in a foreign language. You do not just know mathematical formulas but can use them to solve certain problems. In a competence-oriented learning process, the teacher or lecturer will do less “teaching” but rather support the student’s learning process, for example, by structuring and providing differentiated learning material, by putting qualified learning tasks, or by supporting students in organizing their independent learning.

Enhancing students’ learning process at State Islamic University Sunan Kalijaga of Yogyakarta - based on three principles of higher education will be an alternative that is assumed as an alternative. It is very close to the core values of the State Islamic University Sunan Kalijaga of Yogyakarta. They are inclusive and continue to improve: dedicative, innovative, and integratif-interconnective. This research attempts to design active learning with three pillars of higher education. Research-based learning, education, and community service. Guideline of the concept is the integration of i) research-based learning, ii) education, and iii) community service.

Active learning is an approach to instruction that involves actively engaging students with the course material through discussions, problem-solving, case studies, role plays, and other methods [6]. Active learning approaches place a greater responsibility on the learner than passive approaches such as lectures, but instructor guidance is still crucial in the active learning classroom [7]. Operational learning activities may range from a couple of minutes to whole class sessions or occur over multiple class sessions [8].

Active learning refers to a broad range of teaching strategies that engage students as active participants during class time with their instructor [9]. Typically, these strategies involve some students working together during class but may also involve individual work and reflection. These teaching approaches range from short, simple activities like journal writing, problem-solving, and paired discussions to longer, involved activities or pedagogical frameworks like case studies, role plays, and structured team-based learning.

In a “traditional” class, it is common for only some students in a given course to participate in asking or responding to questions. In contrast, a type with successful active learning activities allows all students to think and engage with course material and practice skills for learning, applying, synthesizing, or summarizing that material [10]. Using active learning strategies does not require abandoning the lecture format. Rather, adding small active learning strategies can make lecturing more effective for student learning. These activities give students just a minute to check their understanding of recent material, practice a skill, or highlight gaps in their knowledge before explaining.

An active learning approach where students develop technically and transversely skills in working on a project [11]. The projects they discussed were related to real life [12]. Project based learning is an approach where students actively solve real-life problems and collaborate in solving them. In project based learning, students' projects are considered the final product [13]. Students in project based learning are involved in investigating authentic problems where solutions have the potential to be implemented and used in real life [14]. The advantages of project based learning are i) giving students the freedom to express

opinions and have discussions with other students, ii) the feelings of students influence the learning process, and iii) feelings of doing something can contribute to group or teamwork, developing metacognitive skills such as self-control, co-regulation, and monitoring as well as training students to direct themselves [15]–[17].

The three pillars of higher education are three main tasks that must be carried out in an integrated manner in universities whose contents are education, research, and community service. Three pillars of higher education has three activities, namely: i) the educational field aims to the intellectual life of the nation and cultural transmission; ii) research, which is to carry out the discoveries in science and culture; and iii) the field of dedication to community which is to carry out the service to the community in speeding the process of improving the welfare and progress of the society [18]. The three pillars of higher education comprises education and teaching, research, and community service [19], [20]. Lecturers are professional workers who must carry out the three pillars of higher education, which is included in the lecturer's workload by PP No. 4 of 2014 RI. Universities have the autonomy to manage their institutions as the center for implementing the three pillars of higher education. Freedom in the academic field includes the determination of operational norms and policies and the implementation of education and community service by the provisions of the legislation [21].

Second, Research is a process of developing knowledge through scientific work by the approach and research model used. The research results are transferred to the implementation of education, especially in learning activities where lecturers deliver teaching materials based on research results. Meanwhile, students will gain up-to-date and up-to-date knowledge. The research results are re-examined through the implementation of subsequent research continuously and continuously. Research is a way to solve problems that arise in society scientifically. State Islamic University Sunan Kalijaga of Yogyakarta, as a university based on socio-religious science, can conduct research with an interdisciplinary approach to make descriptions, explanations, and predictions about social life.

Third, community service carried out by the academic community of the State Islamic University Sunan Kalijaga of Yogyakarta is based on science. Science is an instrument for solving social problems, so community service is the application of knowledge and expertise of the academic community in the context of social life. From the implementation of community service, outputs will be produced as research problems that can be used as subjects for academic research in the performance of education, for example, for writing a thesis or thesis. Implementing the abovementioned pillars of higher education must lead to the critical-constructive, dialogical-integrative, and inclusive-innovative paradigm. Education is a strategy for developing academic research by the competence of lecturers and students. Research is the basis of scientific work instruments and dedication. In comparison, community service is a vehicle for research development and action involving lecturers and students.

State Islamic University Sunan Kalijaga of Yogyakarta carries out education to produce and form human resources who have professional academic abilities, develop and disseminate science, technology, high intellectuality, and Islamic morals. First, Education views knowledge as a product of thought and research by experts according to their respective fields, which is then transferred to students as successors. The product becomes the starting point for research to develop elements of substance, information, and methodology. In this way, new findings will be obtained through academic and development research in the present context. In addition, knowledge is used to apply the academic community's expertise in supporting society's progress. The application of science can be used as a medium to measure the significance of science for the implementation of education in social life. Based on this, feedback can be obtained as input for policy formulation in the field of curriculum and study programs required.

2. METHOD

2.1. Research design

The advantages of project learning are i) giving students the freedom to express opinions and have discussions with other students, ii) the feelings of students influence the learning process, and iii) feelings of doing something can contribute to group or teamwork, the development of metacognitive skills such as self-control, co-regulation, and monitoring as well as training students to direct themselves [15], [17]. The analytical technique used in this study is Miles, Huberman, and Saldana: condensation, data, data presentation, and withdrawal [22]. Data analysis with condensation in qualitative research will accommodate the data more thoroughly without reducing the field findings obtained during the research (data collection process). Presentation of data is a collection of information that allows researchers to draw conclusions and take an [23]. After the data is reduced and the presentation of the data, the next step is concluded. The initial findings are still temporary and will change if no strong and supporting evidence is found at the next data collection stage. Suppose the results at the initial phase have been supported by valid and consistent evidence when the researcher returns to the field to collect data. In that case, the conclusions are credible [24].

2.2. Participants

Some 18 people participated in this study, including 15 students in the master's program (10 women and five men) and three lecturers (all women for English, leadership, and research methods courses). The criteria for student participants are that they are enrolled in the systems mentioned above. Participants were taken from their courses, namely (leadership, linguistics, and sociology, and were taken randomly. The learning process ran. Naturally, it means the participant did not know they were being investigated.

2.3. Instrument

This study developed an instrument in the form of a checklist of questionnaires, namely qualitative observations using a rating scale so that data were obtained in the form of numbers, which were then interpreted narratively. The checklist consists of ten indicators and thirty statements for collecting student's activity. The following ten indicators used in this research include; individual work, self reflection, asking questions, response questions, critical thinking, engage with course material, practice skills, applying, synthesizing, and summarizing.

3. RESULTS AND DISCUSSION

3.1. The process of active learning based on three principles of higher education

By implementing project-based learning, students are more aware of social conditions and express deeper involvement in the learning process when students feel that what they are doing has an impact on others. Application of the learning process based on three pillars of higher education as follows. The indicator of active learning is as follows: active learning is an approach to learning in which students are actively engaged in the learning process. Here are some key characteristics of active learning: active participation: students actively participate in learning rather than being passive listeners. They engage in discussions, group activities, or tasks that require them to think, speak, or take action. Collaboration: active learning encourages collaboration among students. They work in groups, share ideas, and learn from each other. This allows them to develop social skills and learn from different perspectives.

Problem solving: students often face challenges requiring critical thinking and problem-solving. They must develop strategies to address these issues and find solutions. Teacher involvement: teachers serve as facilitators or guides in the learning process rather than just presenters of information. They assist students in exploring topics, provide guidance, and offer feedback to aid understanding. Diverse learning sources: diverse learning sources are used, such as textbooks, online materials, peer conversations, or other resources. This helps students gain a deeper understanding of a particular topic. Reflection and evaluation: students are asked to reflect on their learning, critique their learning outcomes, and plan steps to enhance their understanding. Ongoing assessment is used to track their progress. High motivation: activities that actively engage students tend to increase their motivation for learning. They feel more involved and have a sense of ownership of their learning process.

Diverse contexts: active learning can be applied in various learning contexts, including in the classroom, laboratory, or outside formal settings such as field trips. Adaptation to learning styles: it allows students with various learning styles to participate and learn according to their preferences. Some students may prefer visual learning, while others may prefer hands-on approaches. Lifelong learning: active learning develops problem-solving skills, critical thinking, and adaptability, essential for lifelong learning. It is not just about memorizing facts but also about developing useful skills in various contexts.

The active learning learning model implemented by providing mini research assignments for students by collaborating with the three pillars of higher education is the aim of this research. Here is the concept of the model that was found. There are four points: project-based learning, community service, research, and education. In this case, project-based learning is central to the technique called a student's active learning. So that the lecture process that is created is not only carried out in the classroom but the result of the lecture is a report on performance results. Students are active in lectures by going directly into the community in community service while observing what problems occur and solutions that can be offered to minimize these problems. Next, after students find the problems faced by society, they carry out research related to the problems that occur and think further regarding solutions to these problems. Before conducting research, students prepare research instruments that are appropriate to the research to be conducted. Students also discuss with lecturers regarding the research instruments carried out. This is done so that the data obtained is truly valid. The data obtained is sufficient and able to answer all research questions, so the next thing to do is conduct a research discussion; research process and linked to existing theories to strengthen research findings. In this way, active learning runs well by students and lecturers during the lecture process

and produces work because of project based learning. By implementing it, three pillars of higher education can be reached: community service, research, and education. A model of findings as explained in Figure 1.

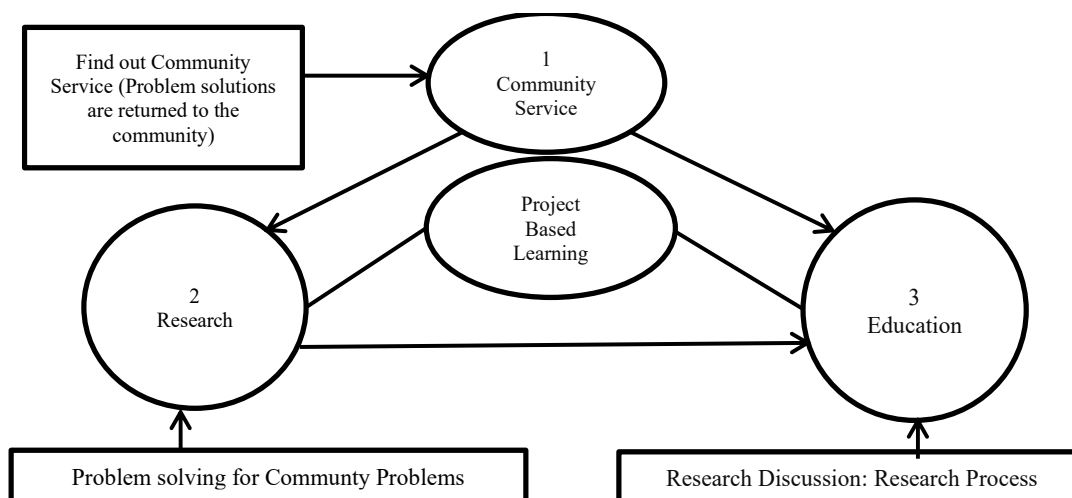


Figure 1. Concept process of active learning based on three principles of higher education

The lecture process based on the three pillars of higher education with the project-based learning method shows that students become subjects in the lecture process. Students are actively involved in the community to make observations related to problems that occur in the community. Students at the State Islamic University Sunan Kalijaga of Yogyakarta were allowed to conduct research related to issues found in the community by analyzing the problem-solving. The learning process is no longer active lecturers but students who are more involved in seeking information, determining and analyzing a problem to choose the right solution according to the conditions of everyday life. Lecturers in the lecture process act as preparing lesson plans, organizing the project, facilitating student's problems, accompanying students, recommending expert needs, and guiding (lecture and expert).

The Table 1 describes the mechanism of project-based learning, which consist of (1) preparing a lesson plan, (5) organizing the project, (6) facilitating student's problem, (10) accompanying students, (11) recommending expert needs, (13) guiding (lecture and expert), (14) guiding, and (15) facilitating. The eight points above are the lectures and student activities as follows. Understanding the lesson plan, understanding the aim of the course, making groups, identifying the community's problem, mapping the community's problem, discussing with a lecture to formulate research questions, determining the research method, looking for literature, designing instruments for data collection, discussing with a lecture for doing data collection, data condensation, data display, conclusion, seminar/dissemination with community, and submit a paper of research on the journal. The Table 1 is the mechanism for project-based learning:

Table 1. Mechanism of project-based learning

No	Lecture	Student
1	Preparing lesson plan	Understand the lesson plan
2	-	Understand the aim of the course.
3	-	Making groups
4	-	Identifying the community's problem
5	Organizing the project	Mapping the community's problem
6	Facilitating student's problem	Discussing with a lecture to formulate research questions
7	-	Determine research method
8	-	Looking for literature
9	-	Designing instruments for data collection
10	Accompanying students	Discussing with the lecture data collection
11	Recommend expert needs.	-
12	-	Data condensation
13	Guiding (lecture and expert)	Data display
14	Guiding	Conclusion
15	Facilitating	Seminar/ dissemination with community
16	-	Submit a paper of research in a journal.

Based on the mechanism of the learning process Tabel 1, it can be seen that the lecturer does less than the students [25]. The students do more activities compared to the lecturers. The learning process applies problem-based learning (PBL) [26]. The problem is the community's real problem of their life. It can be said that it is a contextual learning process. The role of the lecturer is a organizer of lesson plans and course material, facilitator of students' problems, and motivator for students' activity [27]–[29]. When the learning process is based on real problems and solutions, there is an integration and interconnection among sciences. Collaboration of experts happens [30], [31]. In discussing the problem, students get guidance from a few lectures based on their background in science. Students have high responsibility for new scientific discoveries. Students' skill for public speaking is enriched, as well as their self-confidence [32]. Students' skills in academic writing can be improved, too [33]. Correlation between university and community can be intertwined (no ivory tower).

The project-based learning model, which is applied in the lecture process at the State Islamic University Sunan Kalijaga of Yogyakarta, provides opportunities for students to discuss issues actively. Cooperative discussion is where students have class-based conversations focusing on learning, requiring high participation and collaboration. By conducting suitable meetings, students can develop critical thinking skills because students in discussions must consider various perspectives and existing evidence and evaluate the thoughts or opinions taken together. Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information gathered from or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action [34]. So critical thinking is, in short, self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem-solving abilities and a commitment to overcome our native egocentrism and sociocentrism [35].

The learning process is no longer active lecturers but students who are more involved in seeking information, determining and analyzing a problem to choose the right solution according to the conditions of everyday life. Lecturers in the lecture process act as preparing lesson plans, organizing the project, facilitating student's problems, accompanying students, recommending expert needs, and guiding (lecture and expert).

3.2. The student's active learning enhancement

Table 2 shows the enhancement of students' active learning. There are two data, namely before and after the use of the model, as follows: i) individual work 2.4 to 3.0 with its enhancement 0.6; ii) self-reflection 2.1 to 2.6 with its enhancement 0.5; iii) asking question 3.0 to 3.6 with its enhancement 0.6; iv) response question 2.8 to 3.2 with its enhancement 0.4; v) critical thinking 2.5 to 2.9 with its enhancement 0.4; vi) engage with course material 2.4 to 2.8 with its enhancement 0.4; vii) practice skill 3.0 to 3.8 with its enhancement 0.8; viii) applying 2.7 to 3.2 with its enhancement 0.5; ix) synthesizing 2.6 to 2.8 with its enhancement 0.2; and x) summarizing 2.9 to 2.9 with its enhancement 0.2.

Table 2. (Before and after treatment data) student's active learning indicator

Indicator	Before	After	Enhancement
Individual work	2.4	3.0	0.6
Self reflection	2.1	2.6	0.5
Asking question	3.0	3.6	0.6
Respon question	2.8	3.2	0.4
Critical thinking	2.5	2.9	0.4
Engage with course material	2.4	2.8	0.4
Practice skill	3.0	3.8	0.8
Applying	2.7	3.2	0.5
Synthesizing	2.6	2.8	0.2
Summarizing	2.9	2.9	0.0

This research determined ten indicators of active learning, namely i) individual work, ii) self reflection, iii) asking questions, iv) response questions, v) critical thinking, vi) engaging with course material, vii) practice skill, viii) applying, ix) synthesizing, and x) summary. It summarizes or elaborates on the theory used—the enchantment of the score mostly from middle to high category. To clarify, the enhancement of indicators of active learning is also described in the Figure 2.

Based on Table 2, it can be seen that the lowest enhancement is the item “Summarizing Skill,” and the highest one is “Practicing Skill.” Most of the indicators are from middle to high category. According to physical activity strongly influences practical skills. Therefore, this is very logical. The ability to compose a

summary is an item that does not increase because it involves more reading and writing skills [36]. This active learning model specializes in problem-solving abilities. Individual work indicates high achievement after practicing skills, which indicates [37]. Furthermore, the asking question indicator is also relatively high. Applying is also a big improvement because, logically and theoretically, student activities strongly influence this indicator. The hands for question response, critical thinking, and engaging with course material are relatively high because these indicators are closely related to active learning [38].

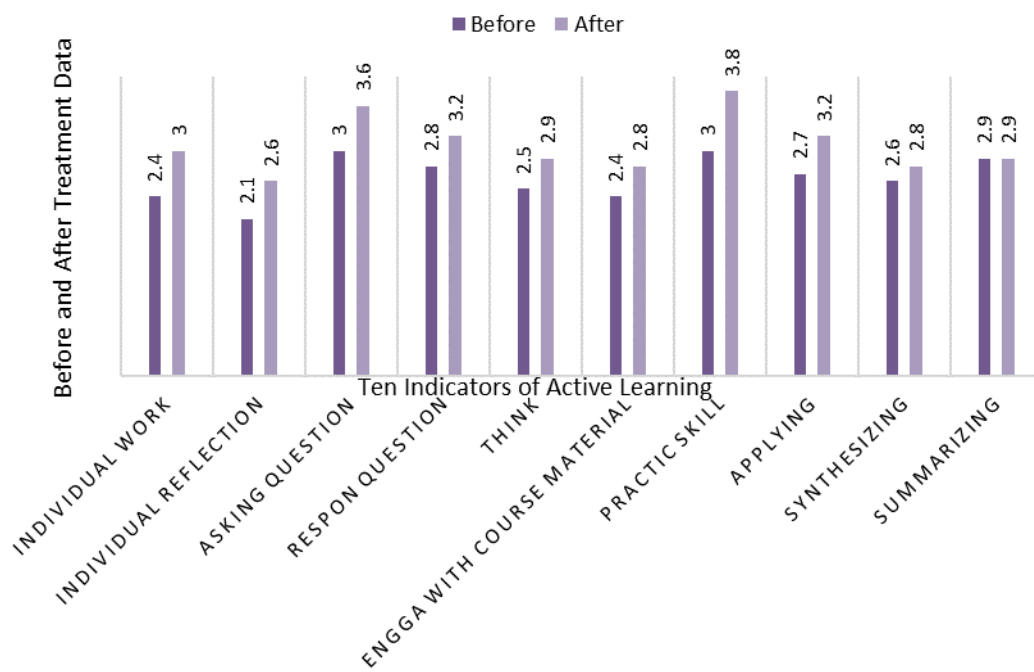


Figure 2. Application of learning process based of three principles of higher education

4. CONCLUSION

Model active learning is an approach to instruction that involves actively engaging students with the course material through discussions, problem-solving, case studies, role plays, and other methods for finding new science. Using this model, students can automatically appreciate the knowledge they have found in depth. The Knowledge found has a real function to solve the problems of people's lives. For the model to be implemented properly, it is necessary to have policies that support it.

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