Improving Communication Skills Through Problem Project Based and Online Learning Integrated in Mpp Courses

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Abstract. This research is motivated by the problem of student learning interaction and communication in online learning which is low with inconsistent learning achievement between personal and classical tests. The research objective is to improve students' communication skills through integrated online project-based learning. The research subjects are students who take the odd semester Educational Research Methodology (MPP) course in 2021–2022 in the Informatics Engineering Education study program, Faculty of Engineering, Yogakarta State University. The results showed that the discussion of problem solving was felt by most of the students to be very helpful in mastering the material and completing projects. The improvement of communication skills in the first cycle was 23.53% in the less category and 76.47% good to 100% good and very good in cycle 2. The largest increase in mastery of the material, but still the lowest communication indicator achievement score.

Keywords: Communication Skills · Problem Based Learning · Online Learning

1 Introduction

The Covid 19 pandemic has had a lot of influence on the habits of human life from worship habits, work, socializing in society, healthy living behavior and is no exception in student study habits. The habit of people working in offices or students studying on campus has become a new habit of studying at home through online-based learning facilities. This new habit is a challenge for most lecturers, especially seniors, to master online learning facilities by presenting interesting, easy-to-understand material, without economically burdening students. The interesting thing, based on conversations between colleagues, it was found that the results of the evaluation of student learning during the online-based pandemic, for the type of evaluation in the form of essays increased, but the evaluation results through multiple choice quizzes that were presented randomly resulted in the opposite achievement.

Many problems arise especially for senior lecturers who are not familiar with online learning, are "forced" to work hard to learn about google classroom, googlemeet, zoom, e-learning, internet-based practicum simulators with all facilities that make it easier for

J. Priyana and N. K. Sari (Eds.): ICERI 2021, ASSEHR 705, pp. 198–207, 2022.
https://doi.org/10.2991/978-2-494069-67-1_22

students to learn. In addition, learning support programs that facilitate the management of learning outcomes.

When all online learning is ready, the question arises what about students who can't afford smartphones or laptops, how is the ability of students to buy internet quota to study for hours. Is there an educational strategy that is able to activate student activities as well as foster critical, creative, collaborative and communicative thinking in all these limitations.

Problem Based Learning (PBL), is a learning model that has a syntax that requires students to work in groups, taking steps similar to research. The reasons why the PBL model was chosen include: (1) requiring students to work together in groups, (2) through giving cases triggering students to think critically, (3) if the cases provided provide many alternative solutions, it will trigger students to think creatively, (4) train students to communicate convey ideas or discussion results.

PBL is a good illustration of an enviroment of social learning that uses the desire to solve issues to develop learning objectives in the brain. Therefore, the problem must be designed to be able to make the brain to form numerous connections. A well-designed problem at an interesting starting point will stimulate learning. The information will be easier to remember if the more structures of brain are recruited and the more connections are formed (O'Conoor, 2012 dalam Baret, 2017:15) [1]. This is where the expertise of the lecturer in formulating problems is tested.

The research aims to improve communication skills. Communication skills are considered important because communication skills affect personality formation, self-actualization and achievement (Rahmayanti, 2014) [2]. It is undeniable that during this pandemic, the use of cellphones for communication has increased greatly. However, communication with cellphones is not tied to the use of Indonesian properly and correctly, more in informal language. Therefore, the increase in the frequency of cell phone usage is thought to actually reduce the ability to formally communicate. Communication skills are emphasized on formal communication that respects the use of Indonesian properly and correctly, mastery of information content. In spoken language the emphasis is on the use of effective sentences and conveying the main idea, while in written language the preparation of sentences is effective and paragraph development.

1.1 Theoritical Review

Problem Based Learning or problem-based learning is a student-centered learning approach that involves groups of students to work together to solve problems. This learning model is applied in every meeting by providing cases relevant to the stages of project completion. The problem-based learning model has three main characteristics; (1) in learning requires students to be actively involved in communicating, developing thinking power, searching and processing data and drawing conclusions; (2) learning activities are aimed at solving problems; (3) problem solving is carried out with a scientific thinking approach (Arifin, 1995) [3]. In line with the opinion above (Duch, 2001) [4] adding that the problem of having to include content related to prior knowledge, if used in group projects requires a level of complexity to ensure students must work together in completing.

The project-based learning model aims to provide students with hands-on experience to produce a work. Students at the end of the semester are obliged to make a project as an implementation of learning outcomes. Projects are assigned personally, but are carried out collaboratively in groups. The PjBL model was chosen, because at the end of learning from this course, students are required to produce a work in the form of a thesis research proposal. The PjBL learning step refers to Bell's opinion (Romadhon, 2020) [5] has 6 steps of activities including: (1) choosing a project topic, (2) designing a project, (3) working on a project, (4) delivering discussion results, (5) assessing work results. Project and (6) reflection of project work. In contrast to Bell's opinion, Kizapan & Bektas (Romadhon, 2020) describes 7 learning steps including: (1) topic determination, (2) group formation, (3) project planning, (4) project implementation, (5) presentation planning, (6) implementation of presentations and (7) evaluation. This research was conducted with reference to Bell's opinion.

With recent technologies, pedagogies, and paradigms used to improve student education through the design and advance of learning, online learning has transformed the learning sector. Chatterjee (2015) [6] in his thesis shows that the proportion of students in higher education who take online learning is at its highest, at 33.5%. Research shows that when online learning is well designed, its effectiveness is no different from face-to-face experiences (Clark, 1983; Russell, 1999; Johnson, Aragon, & Shaik, 2000) in Chatterjee (2015). The success of online learning is strongly influenced by the student perception. If it is negative, it can cause low motivation (Keller & Suzuki, 2004; Maltby & Whittle, 2000), a higher failure rate (Carr, 2000), and lower student satisfaction in online learning environments (Kenny, 2003 in Chatterjee). Investigating the elements of online learning that favorably influence retention, student motivation, and student satisfaction is therefore crucial.

Classroom action research (CAR) learning in direct face-to-face, student activity is seen from physical activities. In contrast to direct face-to-face learning CAR, online class action research on student activity is seen from the traces of activities carried out by students during learning. Therefore, the assessment of communication skills in this study was assessed through writing responses on discussion forums seen from (1) problem clarity, (2) effective use of sentences, (3) effective sentence development structure, (4) use of standard language and (5) essence exposure. Meanwhile, presentation communication skills in addition to the 5 criteria above are added (6) skills in communicating visual language, (7) readability of presentation media and (8) compatibility in color selection and attractiveness of table, graphic or image presentations.

1.2 Integrated Project - Problem - Based Online Learning

Learning is carried out with the following steps.

I.1.1. Pre learning
I.1.1.1. Lecturers prepare all materials and assignments for a full semester in YSU besmart e-learning.
I.1.1.2. Lecturers create WhatApp groups for coordination and consulting services.
I.1.1.3. Lecturer create vicon link with Googlemeet.

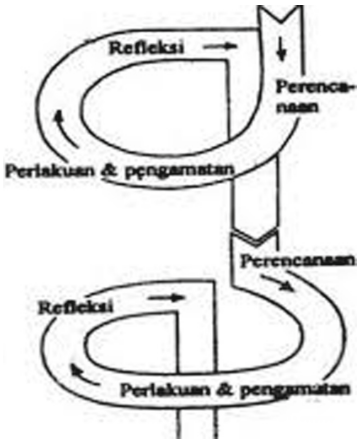

Fig. 1. Kemmis & MC Taggart CAR Model.

I.1.1.4. The lecturer explains the lecture rules related to integrated problem-project based online learning.

I.1.2. Learning Stage

I.1.2.1. Synchronous online stimulation.
I.1.2.2. Explain the learning objectives.
I.1.2.3. Explaining theory as a keyword problem solving.
I.1.2.4. Lecturers provide problems that must be resolved through discussion, because there are several alternative solutions. Discussions are carried out asynchronously.
I.1.2.5. Students collect information and analyze it. The results are presented and are the stages of project completion.
I.1.2.6. At the end of the lesson the research team held a reflection for the improvement of future learning.

1.2.3. The final result of the semester is the realization of a research proposal which is a bill of course learning outcomes.

2 Methods

The research design employs the Kemmis and MC Taggart models. Each cycle consists of four activity steps, namely: (1) Planning, (2) Implementation, (3) Observation, (4) Reflection and decision making for the development of further activities and actions (Cohen, 2005:227) [7]. These steps are illustrated in Fig. 1.

The assessment of communication skills includes the ability to (1) explain the problem, (2) compose effective sentences, (3) develop effective sentences, (4) use standard language and (5) the essence or mastery of the material discussed. For presentations

Table 1. Categorization of Results

Category	score range
Very less	$X \leq M - 1.5$ SD
Less	M-1.5 SD $< X \leq$ M
Well	M $< X \leq$ M + 1.5 SD
Very good	M + 1.5 SD $< X$

(Azwar: 2012) [8]

Table 2. Communication Skills Cycle 1

Range			Freq	% Freq	Category
0	–	8.75	3	8.82	Very less
8.75	–	12.5	5	14.71	Less
12.5	–	16.25	12	35.29	Well
16.25	–	20	14	41.18	Very good
sum			34	100	

other than the five assessment points above, it is added (6) the ability to communicate visual language, (7) media readability, (8) media attractiveness.

The data were analyzed by categorizing into 4 categories, namely very good, well, less and very less. It was determined based on the assumption that the scores of the subject population are normally distributed. The normal distribution is divided into six standard deviation units. Categorization of measurement results into 4 categories, with guidelines that can be used Table 1.

3 Results and Discussion

Student communication skills in cycle 1 are shown in Table 2.

When viewed from each aspect of the assessment between meetings, it is shown in Fig. 2.

There is a development of the ability to explain problems, use of effective sentences and mastery of the essence of the material is increasing. However, in developing paragraphs, students still need to be trained a lot. Meanwhile, the use of standard language is more influenced by the situation. When discussing asynchronously carried away using the language of the day. Therefore, in cycle 2, sentence development and use of standard language received more attention.

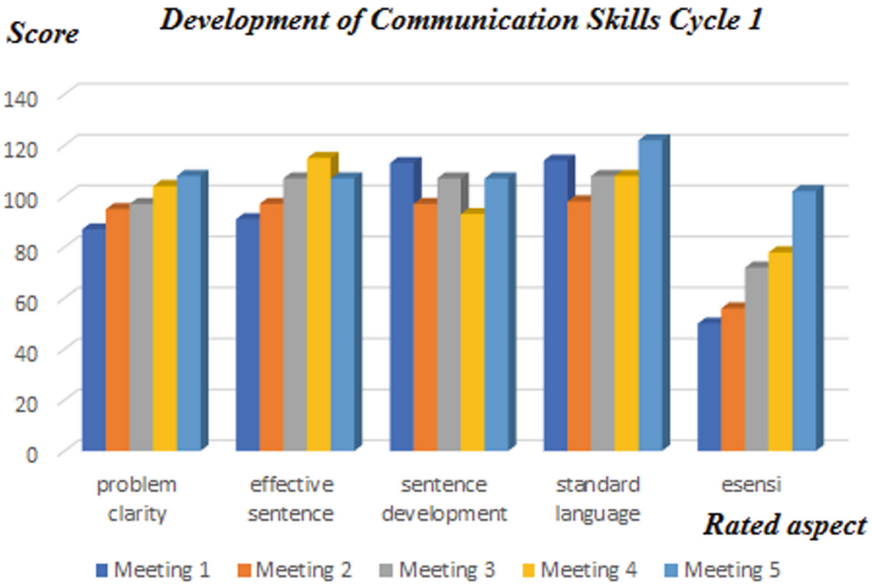

Fig. 2. Development of Aspects of Communication Skills Cycle 1

Table 3. Communication Skills Cycle 2

Range			F	% F	Category
0.00	–	8.75	0	0.00	Very less
8.76	–	12.50	0	0.00	Less
12.60	–	16.25	14	41.18	Well
16.26	–	20.00	20	58.82	Very good
Sum			34	100.00	

4 Cycle 2

In cycle 2, efforts are made to improve all aspects of the assessment, especially aspects of sentence development and the use of standard language. The results of observations in cycle 2 are shown in Table 3.

The development of all aspects of the assessment between meetings during cycle 2 is shown in Fig. 3.

Almost all aspects increase in every meeting. Except at the 3rd meeting aspects of sentence development. This occurs in the material determining the type of variable. Students still have difficulty recognizing variables in the given research case, especially in determining intervening variables. This misunderstanding affects the quality of exposure to learning outcomes, especially in terms of sentence development.

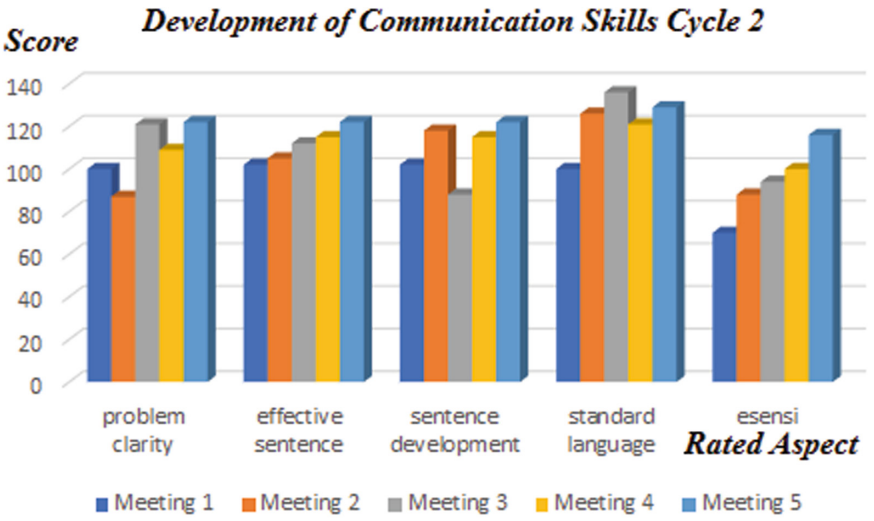

Fig. 3. Development of Aspects of Communication Skills Cycle 3

Table 4. Improving Communication Skills

Range		Cycle 1 (%)	Cycle 2 (%)	Category
0	8.75	8.82	0.00	Very less
8.75	12.5	14.71	0.00	Less
12.5	16.25	35.29	41.18	Well
16.25	20	41.18	58.82	Very good
Sum		100	100	100

5 Improved Communication Skills

Communication skills from cycles 1 and 2 increased. Based on the categories shown in Table 4.

Table 4. Shows that in cycle 2, students' communication skills are 100% in the good and very good categories. This result is in line with research that was able to improve students' oral communication skills by 26.36% (Harianja, JK., 2019: 179) [9]. When viewed based on the percentage increase in scores from the assessment aspect, the increase in communication skills can be summarized in Table 5.

Table 5 shows that the largest increase in mastery of the material. Although this increase is the largest, the score obtained is still the lowest. Therefore, mastery of this material is a priority for efforts to improve communication skills.

This skill can still be improved most effectively, by correcting the aspect that has the largest gap with the ideal score. Based on the value of the gap, the priority for improving communication skills is obtained, illustrated in the Pareto diagram below (Fig. 4).

Table 5. Increase in Aspect of Communication Skills

No	Aspect	Cycle 1 (score)	Cycle 2 (score)	increase (%)
1	Problem clarity	98.2	107.8	9.78
2	Effective sentence	103.4	111.2	7.54
3	Sentence development	103.4	109	5.42
4	Standard language	110	122.4	11.27
5	Essence	71.6	93.6	30.73

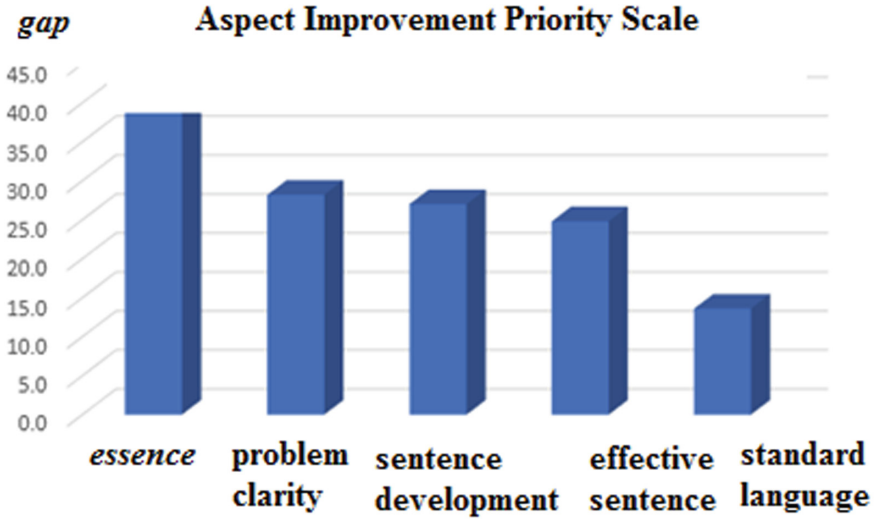

Fig. 4. Priority of Improvement of Communication Skill Aspect

Based on the diagram above, the most effective improvement in communication skills is carried out, through improving aspects from left to right. Namely aspects of mastering the material, explaining the problem, compiling effective sentences, developing effective sentences and using standard language.

This lack of mastery of the material is reinforced by the results of the feedback network at the end of the lecture. At the end of the lecture, each student is required to fill out the form provided at the YSU besmart. The results of the screening are tabulated below.

Table 6 shows that 81% of students still have difficulty in identifying research problems. Students have not been able to capture the educational problems that are displayed in the presentation of cases in learning. Therefore, in future studies, it is better to introduce many educational cases, especially those that have the potential to be used as the title of the final research project.

Table 6. End of Semester Feedback

No	Material	SA	A	DA	SD
1	difficult problem identification	24%	57%	19%	0
2	Preparation of difficult problem background	10%	57%	33%	0
3	Designing research replication from journals is difficult	0	81%	19%	0
4	MPP is easier to understand with lots of discussion	33%	62%	5%	0
5	Assignments help understanding MPP	43%	52%	5%	0
6	MPP courses assist in the preparation of research proposals	57%	43%	0	0

Note: SA = strong agree A = Agree DA = Do not agree SD = Strong Disagree

As many as 67% of students also experienced difficulties in preparing the background of the problem. Students need to be trained in preparing the background of the problem. This needs to be understood because preparing the background of the problem is the most difficult part of preparing a research proposal for most students. It is proven that almost 80% of students who take the final thesis examination experience improvement in the background of the problem. In the MPP course, students are assigned to look for journals that match the field of interest that will be investigated in the final thesis. In this assignment, students review the journal and explore the elements in the research proposal as a step of research replication. As many as 81% of students find this task difficult. Therefore, in the future lectures need to be trained intensively.

As many as 95 percent of students through discussion tasks found it easier to understand the MPP material. It is necessary to reformulate the discussion assignment so that the understanding of theory and application can be improved. Application of knowledge of MPP course content, in fact in the preparation of a final research proposal. This application capability is the main goal of the MPP course. Judging from the student responses, absolutely one hundred percent stated that this MPP course helps in preparing research proposals, it can be said that the objectives of this course have achieved their targets.

6 Conclusions and Suggestions

1. Problem-based online learning – integrated projects have succeeded in improving the communication skills of students taking MPP courses.
2. Improved communication skills from 23.53% less and 76.47% good to 100% good and very good. The biggest increase in mastery of the material is at the same time the lowest score.materi yang sekaligus merupakan skor terendah.

6.1 Suggestion

1. Improvement of communication skills is most effective through increasing priority on mastery of the material, explaining and developing sentences.
2. Mastery of the material is more effectively improved through more assignments, discussions and exercises to identify research problems.

References

1. Barrett, Terry (2017). *A new model of problem-based learning: Inspiring concepts, practice strategies and case studies from higher education.* Maynooth: AISHE.
2. Rahmayanti, F. (2014). Program peningkatan keterampilan komunikasi interpersonal melalui permainan kelompok. Doctoral *Dissertation.* Bandung: Universitas Pendidikan Indonesia).
3. Arifin, M. (1995). *Pengembangan Progam Pengajaran Bidang Studi Kimia.* Surabaya: Airlangga University Press.
4. Duch, B. J., Groh, S. E, & Allen, D. E. (Eds.). (2001). *The power of problem-based learning.* Sterling, VA: Stylus.
5. Romadhon, M.I. (2020). Model pembelajaran online berbasis discovery - project menggunaan e-learning untuk sekolah menengah kejuruan. ***Tesis***. Yogyakarta: Program Pascasarjana UNY.
6. Chatterjee, R. (2015). Exploring the relationship between attitude towards collaborative learning and sense of community among college students in online learning environments: a correlational study. *Thesis.* Iowa State University.
7. https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=5315&context=etd. https://doi.org/10.31274/etd-180810-3862
8. Cohen, L. Cohen, L. Lawrence Manion. and Keith Morisson. (2005). Research Methods in Education. New York: Taylor & Francis e -Library, 2005 5th Ed. p.234.
9. Azwar, S. (2012). *Penyusunan skala psikologi edisi 2.* Yogyakarta: Pustaka Pelajar
10. Harianja, JK. (2019). Implementasi Cooperative Learning dengan Menggunakan Strategi Rally Coach untuk Mengembangkan Keterampilan Komunikasi Matematis. *Jurnal* Riset Pedagogik Dwija Cendekia Vol 3 No 2 Tahun 2019. https://jurnal.uns.ac.id/jdc DOI: https://doi.org/10.20961/jdc.v3i2.34736