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RESEARCH TITLE

**COLLABORATIVE LEARNING FOR FLIPPED CLASSROOM ON
RESEARCH METHODOLOGY SUBJECT**

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Judul : COLLABORATIVE LEARNING FOR FLIPPED CLASSROOM ON RESEARCH METHODOLOGY SUBJECT

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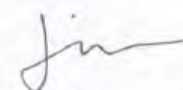
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EXECUTIVE SUMMARY

In most universities in Indonesia, there are many compulsory general subjects for all study programs, such as Pancasila (state ideology) subject, citizenship subject, research methodology subject, academic writing, Bahasa Indonesia, and English for academic purpose. Especially in Udayana University which has more than 100 study programs, is experienced several problems in terms of these subjects utilization. First problem is lack number of lecturers to deliver the subjects to all study programs. Secondly is no learning quality standard, such as no standard in term of curriculum, syllabus, assessment, and evaluation of the subjects. There is no precise monitor and control for whole learning process in all study programs. Finally, is to elevate the quality to be international recognized by joint learning with international partner institutions. Therefore, to solve those problems, this study proposes collaborative learning for flipped classroom using LMS Moodle. Subject of Research Methodology that is taught both in Electrical Engineering Department and Agriculture Technology Department, is taken as a case study.

This research in the first year (year 2018) has produced all tools to analyze readiness, effectiveness, and motivation level of students and teachers have been designed and checked their validity and reliability. Then information of e-learning implementation in Kumamoto University is described briefly. All learning plans, Formative Evaluation, and Learning Object Evaluation are included to complete the research instruments and to evaluate the course for further research. The implementation of the course in both departments will be further analyzed. Finally private university will be included in this project by analyzing its readiness, effectiveness, and motivation level of students and teachers before implementation of the course.

Keywords: flipped classroom, collaborative learning, Research Methodology.

CHAPTER 1. INTRODUCTION

1.1. Background

In this Internet of Things era, e-learning and mobile learning are commonly implemented in most universities, especially in renowned universities, as well as in Indonesia. Beginning of year 2019, the Ministry of Research Technology and Higher Education of Indonesia has released its national recommendation for all higher education institutions to implement e-learning such as blended learning in the classroom [Kemenristekdikti, 2019]. In addition, most universities in Indonesia is equipped with Internet infrastructure, including in Udayana University. Udayana University has more than 100 study programs, in both undergraduate and post-graduate programs, with around 25,000 students. The university has developed e-learning system using LMS Moodle since 2007. However, e-learning or mobile learning implementation is low, less than 20%.

According to DGHE of Ministry of Research and Higher Education rule, all universities in Indonesia has compulsory subjects for all study programs, namely, Citizenship or State Ideology (Pancasila), English for academic purpose, community service, religion, academic writing, and research methodology. However, the university is experienced several problems in terms of these subjects utilization. First problem is lack number of lecturers to deliver the subjects to all study program. Secondly is no learning quality standard. There is no precise monitor and control for whole learning process in all study programs. Finally, is to elevate the quality to be international recognized by joint learning with international partner institutions.

Technology based learning can significantly help to make collaborative learning easier [Miriam Clifford, 2017]. Collaboration had the same results via technology as in person, increased learning opportunities. Learning Management Systems (LMSs) additionally improve collaborative learning and flipped classroom. Most higher education institutions have implement many type of LMSs to manage their online courses, with Moodle as one of the most favoured LMS [Fajar Purnama, 2016]. The LMS Moodle is highly suitable for collaboration learning and high opportunities to develop [Mark Paynter, 2012]. Often collaboration has been limited to curriculum design, or collaboration of

teachers and academics to develop disciplinary texts or other specific materials. An understanding of the cultural elements of each organisation and the nature and effectiveness of interaction within the collaborative group are key points to make the collaborative learning success. They study that schools and universities have similar educational objectives and pedagogies and share much subject matter it is somewhat surprising that there can be examples of effective collaboration between the two.

Other method that uses technology for learning is flipped classroom. The flipped classroom is focused on pedagogical model (Center for Digital Education, 2012), which learning material is explored outside of class by students. Then teachers or lecturers employ the class time to interact with the students in activities such as discussion and Q&A session. Generally, today class put material on line which is easily accessed by the students. Thus, ICT plays important role in the flipped classroom. Flipped classroom has been successfully implemented for short course [Linawati, 2016]. Finally, the LMS Moodle can facilitate the flipped model in a virtual learning environment [Evangelia Triantafyllou, 2015].

Therefore, we propose collaborative learning for flipped classroom to solve the problems. LMS Moodle is selected to apply for this learning model and subject of Research methodology is the pilot project. In the first year of this research i.e. year 2018, all tools, research instruments, and best practice of implementation e-learning in Kumamoto University have been produced. As a result in the second year, the implementation in the class will be analyzed, and will be expanded to private university.

1.2. Problems, Urgency, and Prospective Contributions

All universities in Indonesia are compulsory to have general subjects (MKWU : Mata Kuliah Wajib Umum) in their curriculum [DGHE, 2016] (<http://belmawa.ristekdikti.go.id/2016/12/09/surat-edaran-bahan-ajar-mata-kuliah-wajib-umum/>). The subjects are religion, Pancasila (state ideology), citizenship education, and Bahasa Indonesia. In Udayana University there are more common and compulsory subjects, i.e. research methodology that is compulsory for both undergraduate and postgraduate study programs, English, academic writing, and

community service. Udayana University has faced problems below to manage all these subjects. Moreover we believe that more universities especially private universities with limited number of lecturers face the same problems.

1. Lack number of lecturers with good and relevant competency to deliver the subjects to all study programs.
2. There is lecturer home base rule from DGHE that makes the lecturers has no interest to teach in other study program. Moreover other reason is low reward from the institution.
3. There is no learning quality standard.
4. There is no precise monitor and control for whole learning process in all study programs.
5. There is no measurement of the learning process effectiveness.
6. Low skill of technology application among the lecturers and some students.
7. We need to increase the quality to be international recognized by joint learning with international partner institutions.

Subject of Research Methodology is selected as the pilot project in this study since the subject is required by students starting from undergraduate up to postgraduate (master and doctorate level). There are similarities and differences of the subject contents which depends on study programs. Therefore we will study the subject implementation in both Electrical Engineering Department and Agriculture Technology Department. We will find out how collaborative learning for flipped classroom in both department can be implemented and answer all problems above. Further study will be taken by inviting one department from private university to join the course.

This study is proposed to bring effective solutions for the problems which have mentioned above. Then it will be prospective contributions of the study that are clearly explained below.

1. To provide effective learning process for general and compulsory subjects at the university level.

2. To produce a good model of learning process for general and compulsory subjects for all study programs in Udayana University. Furthermore we expect that the model can be implemented in other universities in Indonesia.
3. To provide international quality standard of learning resources and whole learning process.
4. To promote e-learning or mobile learning especially for basic general and compulsory subjects in Udayana University towards World Class University.

1.3. Principal Research's Relevant Track Record

Table.1. Output of Research Activity as an Example

Year	Activity	Output
2009 - 2013	Research with title 'Integration of Learning Management System and Video Conference Tool to increase learning process effectiveness', funded by DGHE under Hibah Kompetensi.	<ul style="list-style-type: none"> - Three International Conference Papers: (1) Learning Management Systems' Integration (The International Conference on Soft Computing, Intelligent Systems and Information Technology (ICSIT), Univ. Kristen Petra, 1-2 Juli 2010); (2) Implementation and Integration of Learning Management System and Video Conference in Increase of Learning Effectiveness (JICA PREDICT – ITS); (3) Enhancing LMS to Course Design and Implementation - (International Symposium on Open, Distance, and Elearning, Dec 8 - 10 2009). - One International Journal Paper (year 2012): Synchronization Interfaces for Improving Moodle Utilization - Telkomnika, Vol. 10, No. 1, ISSN: 1693-6930 Vol. 10. No. 1, March 2012
2018	Research with title 'Collaborative Learning for Flipped Classroom on Research Methodology Subject', funded by PNPB Unud under Hibah Kerjasama Luar Negeri Udayana.	<ul style="list-style-type: none"> - International Conference Papers: (1) Student's Perception and Learning Outcome Achievement on Blended-Flipped Learning, I Made Supartha Utama, Linawati, NMAD Wirastuti & Tsuyoshi Usagawa, International Mobile Learning Festival 2018, 8th and 9th of June, 2018, Singapore. - One draft International Journal Paper (end of year 2018) - Keynote speaker in 2018 4th IEEE WIECON-ECE, Pattaya, Thailand, title of talk: How Digital Learning Change Education.

In addition, track record of the principal can be seen in the following list.

A. Relevant Research Grant

- 1) Development of Open content of Queueing Theory Visualization – Principal research – DGHE Grant (SPADA) – 2016.
- 2) Sistem E-Learning dengan Metode Adapif Berbasis Moodle Untuk Mengembangkan Center For Learning Innovation Universitas Udayana – Principal – Scheme of Hibah Unggulan Udayana – 2016.
- 3) Pengembangan Media Ajar Berteknologi Hypertext untuk Perkuliahan Sistem Operasi Berbasis Kearifan Lokal Konsep Subak – Principal of Research Partner – Scheme of Hibah Pekerti (Undiksha and Udayana University) – 2011 – 2012.
- 4) Sikap dan Persepsi Dosen di Universitas Udayana terhadap Penggunaan Teknologi Informasi dan Komunikasi dalam Pembelajaran – Member – Scheme of Hibah Udayana – 2010.
- 5) Collaborative Learning for Flipped Classroom on Research Methodology Subject’, funded by PNPB Unud under Hibah Kerjasama Luar Negeri Udayana, Year 2018 (the first year of two years).

B. Relevant Papers

- 1) Performing Active Learning Through Project Based Learning in Electrical and Computer Engineering - Proceedings of the International Mobile Learning Festival 2017.
- 2) Survey on LMS Moodle for Adaptive Online Learning Design – Proceeding of SENASTEK 2016
- 3) Adaptive Online Learning Design Using Moodle – International Conf. IEEE ICSGTEIS , 6 – 8 Oktober 2016
- 4) Proposed Model For E-Exam Availability In WLAN Environment - International Conf. IEEE ICSGTEIS , 6 – 8 Oktober 2016
- 5) Blended Learning Approach of the Flipped Model for Partograph Short Course - Journal of Education and Learning. Vol. 10 (3) pp. 255-264, 2016.

- 6) Project Based Learning of Entrepreneurship in Electrical Engineering Curriculum. IEEE International Conf. on Teaching, Assesment, and Learning for Engineering, 26 – 29 Agustus 2013.
- 7) Performance of Mobile Learning On GPRS Network, Majalah Ilmiah Teknologi Elektro, 2013.
- 8) Ramaswati Purnawan and Linawati. Sikap dan Persepsi Dosen di Universitas Udayana Terhadap Penggunaan Teknologi Informasi dan Komunikasi dalam Proses Pembelajaran. The Excellence Research of Universitas Udayana 2011. ISBN. 978-602-9042-58-0, 2011.
- 9) Sharing and Learning Using Technology: Case of Distance Learning in Udayana University, “International Joint Conference APCHI – ERGOFUTURE”, August 2-6, 2010.

C. Relevant Invited Speaker and Keynote Speaker

- 1) How Digital Learning Change Education, 4th IEEE WIECON-ECE, 2018 Pattaya, Thailand, <http://wieconece.org/scope/keynotes/> (Keynote Speaker).
- 2) Developing Humanitarian Technology Through Student Projects, IEEE WISHY Congress, 5th October 2017. (Invited Speaker).
- 3) Humanitarian Students Projects, WIE Track in R10, HTC 2016, 22 December 2016, Agra, India. (Invited Speaker).
- 4) Blended Learning Approach of the Flipped Model for Short Course, IEEE Tensymp – Women in Engineering Session, 2016. (Invited Speaker).
- 5) Partograph Blended Learning Course, Mercy Corps, Forum Diskusi Inovasi Layanan Kesehatan, 18 April 2012. (Invited Speaker).

D. Relevant Organization

- 1) Head of Udayana Center for Learning Innovation, 2016 – now.
- 2) Member of Lembaga Pengembangan Pembelajaran dan Penjaminan Mutu or Quality Assurance and Learning Development Institution, Udayana University, 2016 – now.

- 3) Director of Global Development Learning Network, Udayana University, 2006 – 2014.

1.4. Importance of International Partner

Kumamoto University, Japan has a great e-learning system using LMS Moodle which has been formally used by all students including International Students. Kumamoto University has developed many new Moodle plugins, and successfully integrates Moodle with the university's academic information system. Therefore, we need to learn how they manage and develop their system and what kind of supporting tools and resources are provided. Thus, we request the Kumamoto University will provide technical assistant, access to the system, join publications, and other supporting tools.

1.5. Research Outputs

Table 2. Proposed Annual Target

No	Type of Outcome				Indicator		
	Category	Sub Category	Mandatory	Optional	CY ¹⁾ (2018)	CY + 1 (2019)	CY+2 (2020)
1	Scientific Publication ²⁾	International	x			x	x
		National – Accredited					
2	Invited speaker in scientific forum ³⁾	International		x	IMLF 2018 - Singapore	x	x
		National					
3	Keynote speaker in scientific forum ⁴⁾	International		x	IEEE WIECON – ECE 2018, Thailand		
		National					
4	Visiting Lecturer ⁵⁾	International		x		x	
5	Intellectual Property Right ⁶⁾	Patent					
		Simple Patent					
		Copy Right					
		Trade Mark					
		Trade Secret					
		Industrial Product Design					
		Geographical Indication					
		Plant Variety Conservation					
		Integrated Circuit					

		Topography Conservation					
6	Intermediate Technology ⁷⁾						
7	Model/ Prototype/ Design/ Art / Social Engineering ⁸⁾		x				x
8	Book (ISBN) ⁹⁾						
9	Technological Readiness Level (TRL) ¹⁰⁾						

Target of International Journal for publication are below.

- 1) International Journal of Mobile and Blended Learning, ISSN 19418647, H-Index 13, Scopus Q3.
- 2) Australasian Journal of Engineering Education, ISSN 13245821, H-Index 3, Scopus Q4.
- 3) IEEE Transaction on Education, ISSN 00189359, H – Index 57, Scopus Q2.
- 4) International Journal of Emerging Technologies in Learning, ISSN 18630383, Scopus Q3.

CHAPTER 2. LITERATURE REVIEW

2.1. Collaborative Learning and Flipped Classroom

According to [Marjan Laal, MD., 2012] collaborative learning (CL) is an umbrella term for a variety of educational approaches involving the joint intellectual effort from small group projects to the more specific form of group work known as cooperative learning. CL suggests a way of dealing with people which respects and highlights individual group members' abilities and contributions. There is a sharing of authority and acceptance of responsibility among group members for the groups' actions. The underlying premise of CL is based upon consensus building through cooperation by group members, in contrast to competition in which individuals best other group members. Key elements of CL include: Positive interdependence, Considerable interaction, Individual accountability, Social skills and Group processing. Then an important thing for FC (flipped classroom) is to have more time in classroom and then to increase interactive learning activities due to without teaching or reducing teaching time. Therefore, it is critical how to apply m-Learning in FC to construct a novel learning model [Hung-Hsu Tsai, 2017]. On the other hand according to [Otgontsetseg Sukhbaatar, 2017] that majority of the students think that MOOC is good source of knowledge and had a positive influence in their learning experience, want to enroll and use. Moreover, (43%) students think that MOOCs are not convenient to use and lack of face-to-face. Majority of the students didn't use MOOC due to preference of physical classroom, lack of spare time and no face-to-face interaction. On the other hand, barriers for MOOC completion has been investigated and main reasons were identified as time management difficulty and overload at university study.

Authors [Rosa M. Carro, 2017] studied to obtain useful criteria for both individual adaptation and dynamic group formation in adaptive collaborative learning systems. They considered their personality and intelligence, the way they group themselves and their results when working individually and collaboratively, in order to find out relationships between their features, the group composition and their achievements. This information can be useful in scenarios of face-to-

face learning, blended learning or e-learning. Then a model of the collaborative learning process in the context of a MOOC is described by [Asma Hassani, 2016]. More precisely, they focused on the evaluation process in the context of MOOCs. This modelling has allowed better understanding of the considered processes and detection of different problems that can occur during an online collaborative and massive learning. In [Kazuhiko Sato, 2016] can be found a design of a collaborative e-learning system for stable operation in an unstable environment of developing countries. The proposed system was used for providing a collaborative learning among local schools of rural area in Nepal. The stable operation of the system is realized by the redundant robustness in three different levels: network arrangement, energy management, replicative database.

Investigation on computer engineering students' readiness and motivations for using dialog games for collaborative learning activities is explored by [Ilker Yengin, 2016]. Students' readiness and motivations are measured by applying a questionnaire and “intrinsic motivation inventory”. The intrinsic motivation inventory is used to assess students' subjective motivations related to a using dialog games in collaborative learning activities. Results showed that students are positively ready to use dialog games in collaborative learning. They find dialog games interesting /enjoyable and useful. On the other hand, students have mixed views on preferring dialog games over the face to face communication and they find traditional methods easier to use than the dialog games. In [Leovy Echeverría, 2016] presents the results related to the use of a Learning Analytics Manager for the monitoring processes of the collaborative learning activities and the students' motivation into the Learning Management System Moodle. The proposed manager was developed as a new functionality integrated to a service called Motivation Booster. This service is the result of a previous work that allowed it embedded into the Moodle system.

On the other hand definitions of blended learning and flipped learning model could be found in (Bart Marty, 2014). The study stressed that flipping is more than watching lectures video. A flipped classroom permits teachers to employ new technique or method in learning process. It shifts from teacher-centered learning to student – centered learning, and from individual to

collaborative learning. In addition the utilization of extra activities such as quizzes and tutorial assignment are included in the flipped learning model for both individual and collaborative learning. The fundamental concept is to accomplish the activities in the class. Further studies on implementation of the flipped classroom are provided by Chen L. (2015), Er, E. (2015), Howitt, C. (2015), Kvashnina O.S. (2016), and Li Y. (2015). The flipped classroom is utilizing by providing text-based lecture notes, pre-recorded multimedia micro-lectures (four to five micro-lectures of 15 to 20 minutes), e-learning system as an online resource for students, and an individual assessment test for each class (Chen L., 2015) in order to systematically identify students' perspective of using cooperative learning in a flipped statistics classroom by utilising Q-methodology. The flipped classroom was applied in postgraduate education using case studies that was written as chronological stories from email correspondence between the two lecturers as critical friends, as well as from student feedback in the form of face-to-face discussions, online discussions, emails, mind maps, multimodal discussion boards and end-of-semester university surveys (Howitt, C. 2015).

In addition, the study on behaviour of college students' online help-seeking in a flipped classroom with a web-based help-seeking tool is conducted by Er, E. (2015). The web-based help-seeking tool was developed to enable students to ask questions about the course content and receive the needed help while studying the lecture themselves outside the classroom. Then an integration of MOOC content and flipped classroom practice was applied in undergraduate course named "Internet and Distance Education", and to see its effectiveness through students' experience and perceptions (Li, Y. 2015). Finally Kvashnina, O.S. (2016) describes significant benefits of the flipped classroom in ESL (English as a Second Language) teaching including an increase in students' overall performance on the course, enhancement of students' motivation and improvement of their autonomous learning skills.

As Internet becomes society basic need, then students are already comfortable with Internet, e-books, e-content, and social media as their life style. Therefore the students have been applied active learning which is recognized as flipped learning technique (Centre for Digital Education, 2012). The students are

used to watch online lecture, courseware, language translation, social network, content access, webcast style before entering the classroom. On the other hand, in higher education environment, tough economy is a factor that pushing the education toward blended learning and flipped classroom model. Thus blended learning approach of the flipped classroom is suggested to apply for higher education to fulfil both individual and organization target.

2.2. Research Road Map

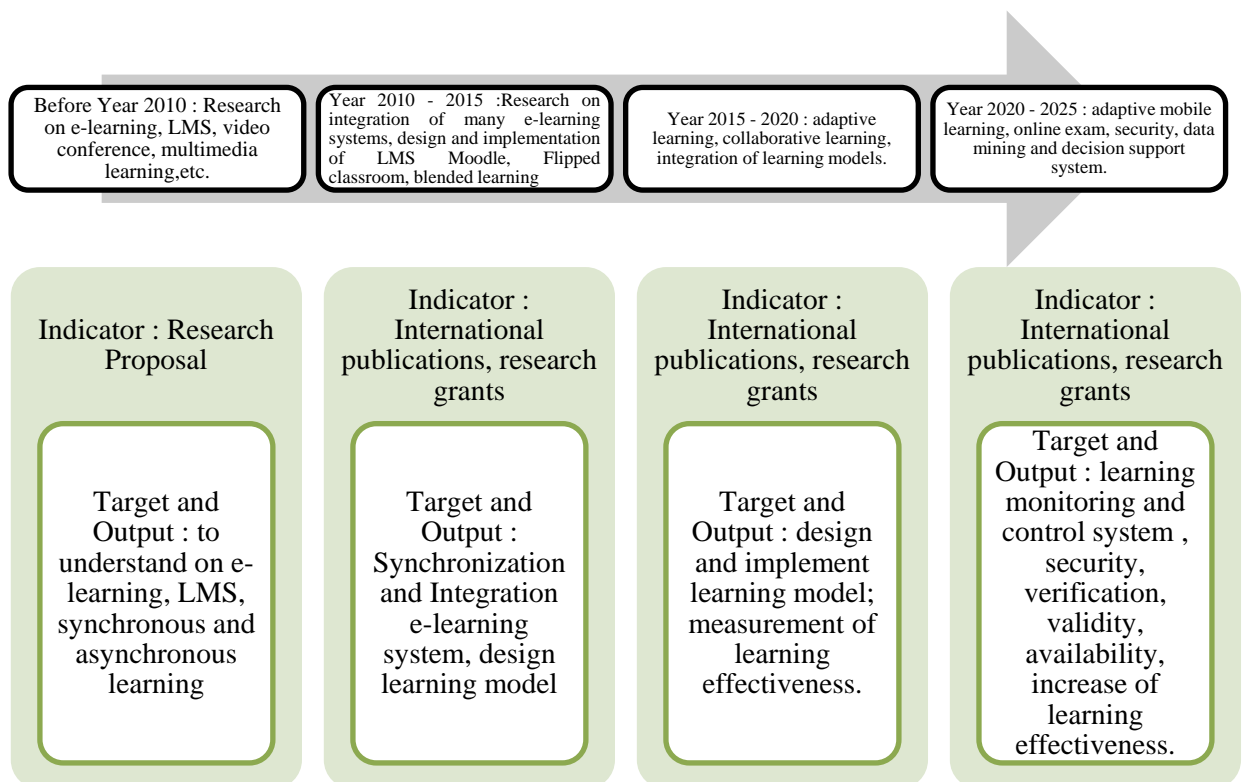


Figure 1. Road Map of the Research

2.3. The Importance of the Research

Udayana University has sufficient supporting resources to utilize technology based learning or e-learning or mobile learning. The university has adequate ICT infrastructure, capable human resources, and e-learning centre, i.e. Udayana Center for Learning Innovation. Accordingly promoting e-learning implementation to provide effective learning process with international standard

in Udayana University is highly requirement. Additionally Udayana University has around 10% international students of total students. There are also general subjects for the students, such as Bahasa Indonesia and Culture of Indonesia. This obligates the university to develop high reliable online learning system.

Online learning system, either implements as fully online learning or blended learning, it must to be effective solutions, since the system can provide following benefits:

- Technology makes easier to monitor and control the system and more accurate.
- It is easier to update, distribute, and access.
- It is easier to manage.
- It is easier to modify which depends on uniqueness of study program without eliminating fundamental requirement.

As a result, the importance of the research can be summarized below.

- There will be good e-learning model in Udayana University for any subjects in all study programs for all students including international students.
- There will improve learning effectiveness.

CHAPTER 3. RESEARCH METHOD

3.1. Location and Time

The research will be in Electrical Engineering Department, Agriculture Technology Department, Udayana University, and private university in Bali, i.e. Dhyanaपुरa University for research methodology courses. This is two years research period. The University partner has given access online to their system and provide relevant data. In year 2018, Prof. Tsuyoshi Usagawa (University Partner) has been invited as a Guest Lecture in the workshop in Gedung Pascasarjana, Sudirman. Then we will do site visit to Kumamoto University in year 2019.

3.2. Data

Qualitative and quantitative Data – data will be collected from research methodology courses in both departments, Udayana University, data from Private University, as well as in Kumamoto University, Japan. The data are students profile, curriculum, syllabus, course contents, learning assessments, learning evaluation, learning process, and ICT capability both in Udayana University and Kumamoto University, Japan. In general, there will be two evaluation system to measure the learning effectiveness, i.e. formative evaluation and summative evaluation. Formative evaluation was applied in the first year of the research and both formative and summative evaluations will be applied in the second year. Hence the effectiveness can be analyzed and compared.

3.3. Research Flow Diagram

Figure 2 displays the proposed research flow diagram which can be seen as a research design below.

- Year 2018 – All activities below have been done.
 - The effectiveness of existing learning process of research methodology course in both EE (Electrical Engineering) Department and AT (Agriculture Technology) Department was analyzed. This

measurement was a baseline indicator to recognize the improvement after implementing the collaborative learning model.

- Analysis of Readiness level and Motivation (student, lecturers, institution) in Udayana University and Kumamoto University were done.
- Readiness level and motivation of students, lecturers, and institution for research methodology course were measured and analyzed in both Universities, especially in EE Department & AT department (Udayana University) and in Electrical Computer Engineering Department (Kumamoto University). Then comparison analysis is used as an input for learning model design.

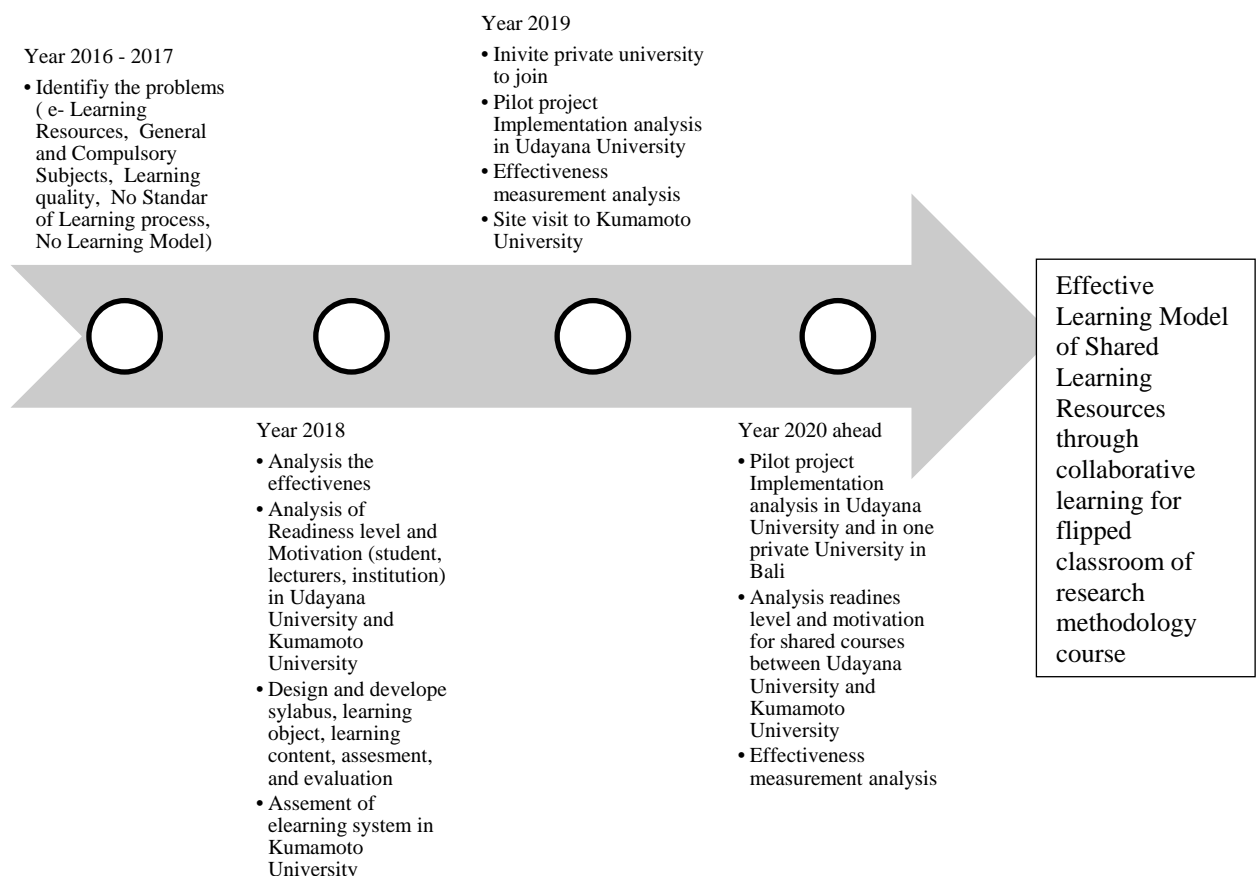


Figure 2. Research Diagram

- Syllabus, learning object, learning content, assessment, and evaluation have been developed.
- Assessment of e-learning system in Kumamoto University was done. Research partner did the assessment and has shared the information.
- Formative evaluation. Figure 3 below is briefly explained the process.

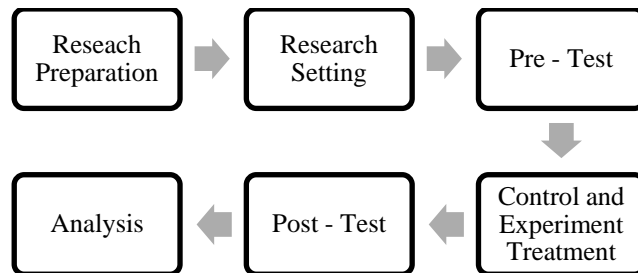


Figure 3. Research Procedure

- Year 2019
 - Invite one private university to join. This year starts with readiness and motivation level analysis of its students and lecturers for the similar course.
 - Pilot project Implementation analysis in Udayana University
 - Effectiveness measurement analysis
 - Site visit to Kumamoto University
- Year 2020 Ahead
 - Pilot project Implementation analysis in Udayana University and in one private University in Bali.
 - Analysis readiness level and motivation for shared courses between Udayana University, private university in Bali, and Kumamoto University.
 - Effectiveness measurement analysis

CHAPTER IV. RESULTS AND DISCUSSIONS

4.1 PROFIL STUDY PROGRAM

In this second year of research program, as stated in research roadmap, we approach and collaborate with partner institution for collaborative learning project for subject of research methodology. The partner is private institution in Bali, namely Dhyana Pura University. We cooperate with Department of Management, Faculty of Economy and Humanities. Therefore the course of research methodology will be implemented in Postgraduate Program of Electrical Engineering, Agriculture Technology Department (Undergraduate Program) of Udayana University, and Management Department of Dhyana Pura University. Overseas partner is Kumamoto University. The profiles of University of Kumamoto has been presented by Prof. Usagawa during his visit on 11 of August 2018 until 15 of August 2018. The programs profile of all departments can be seen in Table 3.

Study Program	Magister of EE Udayana University	AT Department Udayana University	University of Kumamoto	Management Department Dhyana Pura University
Degree	Postgraduate (Master Degree)	Undergraduate (Bachelor Degree)	Undergraduate and Postgraduate	Undergraduate
Year of Students who take Research Methodology Subject	First Semester (Year 1)	Year 2 (4 th Semester)	After Year 1	Year 2 (4 th Semester)
Number of Students	30	50	More than 50	More than 100
Campus	Sudirman	Bukit Jimbaran	Kumamoto, Japan	Dalung, Bali
Existing Method of Learning	F2F in class room	Blended Learning	Fully online learning, blended learning, flipped classroom, MOOC	F2F in class room
ICT Support	Good capacity of University IT Infrastructure for e-learning (Bandwidth, Wifi, Server)	Good capacity of University IT Infrastructure for e-learning (Bandwidth, Wifi, Server)	High capacity of University IT Infrastructure for e-learning (Bandwidth, Wifi, Server)	Moderate capacity of University IT Infrastructure for e-learning

4.2 Design of Implémentation

All tools for the research are prepared below. There are three questionnaires to capture effectiveness level, readiness level, and motivation level of students, teachers, and readiness of institution. Detail of the questionnaires is attached in the appendix. The questionnaires has been be analysed their validity and reliability in the first year of research. The results will be presented below.

The subject Learning Outcome, syllabus and RPS (Semester Learning Plan or SLP) are then designed and developed. All EE Department, AT Department, and Management Department already have their own. Therefore discussion on the learning outcome, syllabus and SLP have been intensively conducted to find the similarity, fundamental concept of the course for all departments, and the differences according to the degree level. Figure 4 displays general procedure of the course which was modified from standard operating procedure of [Kementerian Pendidikan dan Kebudayaan, 2014], and table 4 shows the design process of shared course.

Table 4. Course Sharing Design

Item/Content	Magister EE Department	AT Department (Undergraduate)	Management Department (Undergraduate)
Learning Outcome	EE	AT	MD
Syllabus	EE	AT	MD
SLP or RPS	EE	AT	MD
Shared Learning Content	shared	shared	Shared
Separate Learning Content	EE	AT	MD
Self Evaluation, Group Evaluation, Course Evaluation	yes	yes	Yes
Assignment	Literature Review	Multiple Choice / Essay	Test, Essay
Tutorial	Writing Proposal	Writing Proposal	Work report
Mid Exam	Proposal or Paper	Multiple Choice / Essay	Test, Essay
Final Exam	Paper	Multiple Choice / Essay	Test, Essay

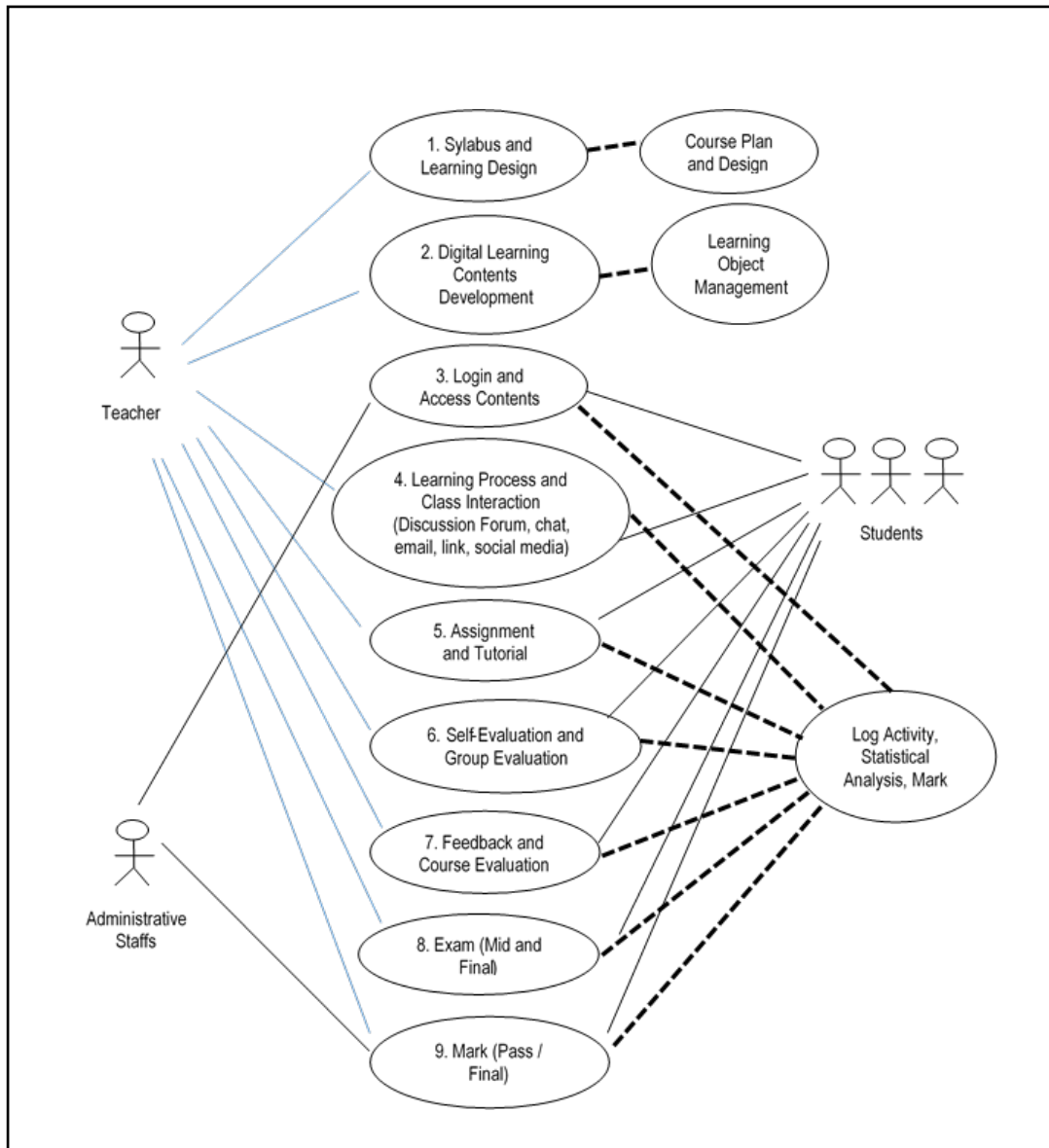


Figure 4. Use Case Diagram for General Flow of the Course for All Departments

REFERENCES

- Asma Hassani; Sonia Ayachi Ghanouchi (2016). Modeling of a collaborative learning process in the context of MOOCs. 2016 Third International Conference on Systems of Collaboration (SysCo). Pages: 1 – 6.
- Bart Marty (2014). Blended and Flipped: Exploring New Models for Effective Teaching & Learning. A Magna Publication.
- Center for Digital Education (2012). Issue Brief The Flipped Classroom Increasing Instructional Effectiveness in Higher Education with Blended Learning Technology for Higher education students. Available at www.echo360.com.
- Chen L., Chen T.L., Chen N.S. (2015). Students' perspectives of using cooperative learning in a flipped statistics classroom. Australasian Journal of Educational Technology, 2015, 31(6) pp. 621-640.
- DGHE (2016). <http://belmawa.ristekdikti.go.id/2016/12/09/surat-edaran-bahan-ajar-mata-kuliah-wajib-umum/>
- Er, E., Kopcha, T. J., Orey, M., Dustman, W. (2015). Exploring College Students' Online Help-Seeking Behavior in a Flipped Classroom with a Web-Based Help-Seeking Tool. Australasian Journal of Educational Technology, 31(5), 537-555
- Evangelia Triantafyllou (2015). The flipped classroom: design considerations and Moodle. Proceedings of the ETALEE 2015 Conference, Exploring Teaching for Active Learning in Engineering Education DTU, Copenhagen, Denmark, November 11-12 2015, pp. 5 – 11.
- Fajar Purnama; Tsuyoshi Usagawa; Royyana M Ijtihadie; Linawati (2016). Rsync and Rdiff implementation on Moodle's backup and restore feature for course synchronization over the network 2016 IEEE Region 10 Symposium (TENSYMP), Year: 2016, Pages: 24 – 29.
- Howitt, C. and Pegrum, M. (2015). Implementing a flipped classroom approach in postgraduate education: An unexpected journey into pedagogical redesign. Australasian Journal of Educational Technology, 31(4), 458-469.
- Hung-Hsu Tsai, Jie-Yan Peng, You-Ming Yong, Pao-Ta Yu (2017). Design of Mobile Learning Feedback Analysis System for Flipped Classroom, Proceedings of the International Mobile Learning Festival 2017: Mobile Learning, Emerging Learning Design & Learning 2.0, June 8-10, 2017, Hong Kong, PP. 33 – 44.
- Ilker Yengin; Ibrahim Furkan Ince (2016). Computer engineering students' readiness and motivations for using dialog games in collaborative learning, 15th International Conference on Information Technology Based Higher Education and Training (ITHET), Pages: 1 – 8.
- Kemenristekdikti, Rekomendasi Rakernas – Kemenristekdikti, Semarang, 3 – 4 Januari, 2019.
- Kazuhiko Sato; Suresh Shrestha; Pramesh Shrestha; Bishnu Prasad Gautam (2016). Implementation of Collaborative E-Learning System for Unstable Environment, 2016 Intl IEEE Conferences on Ubiquitous Intelligence & Computing, Advanced and Trusted Computing, Scalable Computing and Communications, Cloud and Big Data Computing, Internet of People, and Smart World Congress, Pages: 496 - 501

- Kvashnina O.S., Martynko E.A. (2016). Analyzing the Potential of Flipped Classroom in ESL Teaching. *iJET*. Vol. 11(03) pp. 71 – 73. <http://dx.doi.org/10.3991/ijet.v11i03.5309>
- Leovy Echeverría; Ana Benitez; Sergio Buendia; Ruth Cobos; Mario Morales (2016). Using a learning analytics manager for monitoring of the collaborative learning activities and students' motivation into the Moodle system, IEEE 11th Colombian Computing Conference, Pages: 1 – 8.
- Li Y., Zhang M., Bonk C.B., Guo Y. (2015). Integrating MOOC and Flipped Classroom Practice in a Traditional Undergraduate Course: Students' Experience and Perceptions, *iJET*. Vol.10 (6) pp. 4 – 10. <http://dx.doi.org/10.3991/ijet.v10i6.4708>
- Marjan Laal, MD., Mozghan Laal (2012). Collaborative learning: what is it?, *Procedia - Social and Behavioral Sciences* 31 (2012) 491 – 495.
- Mark Paynter, Neville Bruce (2012). Case Studies: Using Moodle for Collaborative Learning with University and Senior Secondary Students, 1st Moodle Research Conference, Heraklion, Crete-Greece September, 14 - 15, 2012, pp. 33 – 38.
- Miriam Clifford (2017). 20 Collaborative Learning Tips And Strategies For Teachers, available on <http://www.teachthought.com/pedagogy/20-collaborative-learning-tips-and-strategies/>, accessed on July 3, 2017.
- Otgontsetseg Sukhbaatar, Zorig Badarch, Lodoiravsal Choimaa, Tsuyoshi Usagawa (2017). Students' perception of MOOCs in National University of Mongolia: a survey study, *Proceedings of the International Mobile Learning Festival 2017*, pp. 148 – 155.
- Rosa M. Carro; Victor Sanchez-Horreo (2017). The effect of personality and learning styles on individual and collaborative learning: Obtaining criteria for adaptation. 2017 IEEE Global Engineering Education Conference (EDUCON), Pages: 1585 – 1590



RENCANA PEMBELAJARAN SEMESTERs

PROGRAM STUDI MANAJEMEN

FAKULTAS EKONOMIKA DAN HUMANIORA



MATA KULIAH	KODE	Rumpun MK	SEMESTER	SKS
Metodelogi Penelitian	MAN.KP.16	Mata Kuliah Kompetensi Umum Program Studi	4 (EMPAT)	3 (TIGA)
OTORISASI	Pengembang RPS		Koordinator MK/RMK	Ketua Program Studi
	(Dr. Christimulia Purnama Trimurti)			(Dr. Yeyen Komalasari)
Capaian Pembelajaran (CP)	CPL-PRODI			
	A.	Kompetensi Lulusan (SNDIKTI) – SIKAP 1. Bertaqwa kepada Tuhan Yang Mahas Esa dan mampu menunjukkan sikap religius 2. Menjunjung tinggi nilai kemanusiaan dalam menjalankan tugas berdasarkan agama, moral dan etika 3. Berkontribusi dalam peningkatan mutu kehidupan bermasyarakat, berbangsa, bernegara, dan peradaban berdasarkan Pancasila 4. Berperan sebagai warga negara yang bangga dan cinta tanah air, memiliki nasionalisme serta rasa tanggung jawab pada negara dan bangsa 5. Menghargai keanekaragaman budaya, pandangan, agama, dan kepercayaan, serta pendapat atau temuan orisinal orang lain 6. Bekerjasama dan memiliki kepekaan sosial serta kepedulian terhadap masyarakat dan lingkungan 7. Taat hukum dan disiplin dalam kehidupan bermasyarakat dan bernegara 8. Menginternalisasi nilai, norma, dan etika akademik 9. Menunjukan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri 10. Menginternalisasi semangat kemandirian, kejuangan, dan kewirausahaan		
	B.	Kompetensi Lulusan (SNDIKTI) – KETRAMPILAN UMUM 1. Mampu menerapkan pemikiran logis, kritis, inovatif, bermutu, dan terukur dalam melakukan pekerjaan yang spesifik di bidang keahliannya serta sesuai dengan standar kompetensi kerja bidang yang bersangkutan 2. Mampu menunjukkan kinerja mandiri, bermutu, dan terukur 3. Mampu mengkaji kasus penerapan ilmu pengetahuan, teknologi atau seni sesuai dengan bidang keahliannya dalam rangka menghasilkan prototype, prosedur baku, desain atau karya seni 4. Mampu menyusun hasil kajiannya dalam bentuk kerja kerja, spesifikasi desain, atau esai seni, dan mengunggahnya dalam laman perguruan tinggi		

5. Mampu mengambil keputusan secara tepat berdasarkan prosedur baku, spesifikasi desain, persyaratan keselamatan dan keamanan kerja dalam melakukan supervisi dan evaluasi pada pekerjaannya
6. Mampu memelihara dan mengembangkan jaringan kerjasama didalam maupun diluar negeri
7. Mampu bertanggungjawab atas pencapaian hasil kerja kelompok dan melakukan supervisi dan evaluasi terhadap penyelesaian pekerjaan yang ditugaskan kepada pekerja yang berada dibawah tanggungjawabnya
8. Mampu melakukan proses evaluasi diri terhadap kelompok kerja yang berada dibawah tanggungjawabnya, dan mampu mengelola pembelajaran secara mandiri
9. Mampu mendokumentasikan, menyimpan, mengamankan, dan menemukan kembali data untuk menjamin kesahihan dan mencegah plagiasi

C. Kompetensi Lulusan (SNDIKTI) – KETRAMPILAN KHUSUS

1. Mampu melakukan penelitian ekonomi khususnya ilmu manajemen
2. Mampu membaca hasil penelitian
3. Mampu menyajikan hasil penelitian dalam bentuk skripsi/laporan penelitian/jurnal

Kompetensi Lulusan (SNDIKTI) – PENGETAHUAN

1. Mampu memahami Pendekatan Ilmiah dan Non Ilmiah
2. Mampu memahami Etika dalam Riset
3. Mampu memahami Proses Penelitian, Variabel, dan Paradigma Penelitian pada Metode Kuantitatif
4. Mampu memahami Landasan Teori, Kerangka Berpikir, dan Pengajuan Hipotesis pada Metode Kuantitatif
5. Mampu memahami Populasi dan Sampel pada Metode Kuantitatif
6. Mampu memahami Skala Pengukuran pada Metode Kuantitatif
7. Mampu memahami Tehnik Pengumpulan Data pada Metode Kuantitatif
8. Mampu memahami Masalah, Fokus, Judul dan Teori pada Metode Kualitatif
9. Mampu memahami Tehnik Pengambilan Populasi dan Sampel dalam Penelitian Kualitatif
10. Mampu memahami Instrumen dan Tehnik Pengumpulan Data dalam Penelitian Kualitatif
11. Mampu memahami Tehnik Analisis Data dalam Penelitian Kualitatif
12. Mampu memahami Tata Cara Penulisan Proposal Penelitian pada Bab 1 Skripsi
13. Mampu memahami Tata Cara Penulisan Proposal Penelitian pada Bab 2 Skripsi
14. Mampu memahami Tata Cara Penulisan Proposal Penelitian pada Bab 3 Skripsi

CP-MK

Capaian Mata Kuliah Metodologi Penelitian :

1. Mampu memahami Pendekatan Ilmiah dan Non Ilmiah
2. Mampu memahami Etika dalam Riset
3. Mampu memahami Proses Penelitian, Variabel, dan Paradigma Penelitian pada Metode Kuantitatif
4. Mampu memahami Landasan Teori, Kerangka Berpikir, dan Pengajuan Hipotesis pada Metode Kuantitatif
5. Mampu memahami Populasi dan Sampel pada Metode Kuantitatif
6. Mampu memahami Skala Pengukuran pada Metode Kuantitatif
7. Mampu memahami Tehnik Pengumpulan Data pada Metode Kuantitatif

						8. Mampu memahami Masalah, Fokus, Judul dan Teori pada Metode Kualitatif 9. Mampu memahami Tehnik Pengambilan Populasi dan Sampel dalam Penelitian Kualitatif 10. Mampu memahami Instrumen dan Tehnik Pengumpulan Data dalam Penelitian Kualitatif 11. Mampu memahami Tehnik Analisis Data dalam Penelitian Kualitatif 12. Mampu membuat Proposal Penelitian pada Bab 1 Skripsi 13. Mampu membuat Proposal Penelitian pada Bab 2 Skripsi 14. Mampu membuat Proposal Penelitian pada Bab 3 Skripsi	
Deskripsi Singkat Matakuliah	Pada mata kuliah ini mahasiswa belajar tentang bagaimana mahasiswa membuat proposal penelitian pada ruang lingkup ekonomi khususnya ilmu manajemen, melakukan penelitian pada ruang lingkup ekonomi khususnya ilmu manajemen, membaca hasil penelitian						
Daftar Referensi	<p>Utama :</p> <ol style="list-style-type: none"> 1. Sugiyono, 2018, Metode Penelitian Manajemen, Alfabeta 2. Augusty Ferdinand, 2014, Metode Penelitian Manajemen (Pedoman Penelitian untuk Penulisan Skripsi, Tesis dan Disertasi), Undip Press 3. Sudaryono, 2017, Metodologi Penelitian, RajaGrafindo Persada <p>Pendukung :</p> <ol style="list-style-type: none"> 1. Deni Darmawan, 2013, Metode Penelitian Kuantitatif, Remaja Rosdakarya 2. Nanang Martono, 2015, Metode Penelitian Sosial (Konsep-Konsep Kunci), RajaGrafindo Persada 3. Djunaidi Ghony & Fauzan Almanshur, 2016, Metode Penelitian Kualitatif, Ar-Ruzz Media 4. Ruslam Ahmadi, 2014, Metodologi Penelitian Kualitatif, Ar-Ruzz Media 5. Afrizal, 2016, Metode Penelitian Kualitatif : Sebuah Upaya Mendukung Penggunaan Penelitian Kualitatif dalam Berbagai Disiplin Ilmu, RajaGrafindo Persada 6. Burhan Bungin, 2017, Metodologi Penelitian Kualitatif : Aktualisasi Metodologis ke Arah Ragam Varian Kontemporer, RajaGrafindo Persada 						
Media Pembelajaran	White Board, LCD dan Projector						
Dosen Pengampu (Team Teaching)	Dr. Christimulia Purnama Trimurti						
Matakuliah Syarat	MAN.KL.02						
Minggu	Kemampuan Akhir yang Diharapkan/CLO	Bahan Kajian/Materi Pembelajaran	Metode/Bentuk Pembelajaran	Waktu	Pengalaman Belajar Mahasiswa	Penilaian	
						Kriteria/Indikator	Bobot (%)
1	Mahasiswa dapat memahami	1. Pengertian Metodologi Penelitian	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami	Tes, tugas dan unjuk	5

	Pendekatan Ilmiah dan Non Ilmiah	2. Macam Data Penelitian 3. Macam Metode Penelitian 4. Kapan Metode Kuantitatif, Kualitatif dan Kombinasi digunakan			Pendekatan Ilmiah dan Non Ilmiah	kerja	
2	Mahasiswa dapat memahami Etika dalam Riset	1. Etika Peneliti terhadap Responden 2. Etika Peneliti terhadap Klien 3. Etika Peneliti terhadap Asisten Peneliti 4. Etika Klien terhadap Peneliti	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Etika dalam Riset	Tes, tugas dan unjuk kerja	5
3	Mahasiswa dapat memahami Proses Penelitian, Variabel, dan Paradigma Penelitian pada Metode Kuantitatif	1. Alur Penelitian Kuantitatif 2. Jenis-jenis rumusan masalah 3. Jenis-jenis variabel penelitian kuantitatif	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Proses Penelitian, Variabel, dan Paradigma Penelitian pada Metode Kuantitatif	Tes, tugas dan unjuk kerja	10
4	Mahasiswa dapat memahami Landasan Teori, Kerangka Berpikir, dan Pengajuan Hipotesis pada Penelitian Kuantitatif	1. Pengertian Teori 2. Tingkatan dan Fokus Teori 3. Kegunaan Teori dalam Penelitian 4. Deskripsi Teori 5. Kerangka Berpikir 6. Hipotesis	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Landasan Teori, Kerangka Berpikir, dan Pengajuan Hipotesis pada Penelitian Kuantitatif	Tes, tugas dan unjuk kerja	10
5	Mahasiswa dapat memahami Populasi dan Sampel pada Metode Kuantitatif	1. Populasi 2. Sampel 3. Tehnik Sampling 4. Menentukan Ukuran Sampel 5. Cara mengambil anggota Sampel	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Populasi dan Sampel pada Metode Kuantitatif	Tes, tugas dan unjuk kerja	5
6	Mahasiswa dapat memahami Skala Pengukuran pada Metode Kuantitatif	1. Macam-macam skala pengukuran 2. Instrumen Penelitian 3. Cara menyusun instrument penelitian 4. Validitas dan Reliabilitas 5. Pengujian Validitas dan	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Skala Pengukuran pada Metode Kuantitatif	Tes, tugas dan unjuk kerja	5

		Reliabilitas Instrumen					
7	Ujian Tengah Semester (Melakukan validasi hasil penilaian, evaluasi, dan perbaikan proses pembelajaran berikutnya)						
8	Mahasiswa dapat memahami Teknik Pengumpulan Data pada Metode Kuantitatif	<ol style="list-style-type: none"> 1. Interview 2. Kuisisioner 3. Wawancara 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Teknik Pengumpulan Data pada Metode Kuantitatif	Tes, tugas dan unjuk kerja	10
9	Mahasiswa dapat memahami Masalah, Fokus, Judul dan Teori pada Metode Kualitatif	<ol style="list-style-type: none"> 1. Masalah dalam Penelitian Kualitatif 2. Fokus Penelitian 3. Bentuk Rumusan Masalah 4. Judul Penelitian Kualitatif 5. Teori dalam Penelitian Kualitatif 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Masalah, Fokus, Judul dan Teori pada Metode Kualitatif	Tes, tugas dan unjuk kerja	5
10	Mahasiswa dapat memahami Teknik Pengambilan Populasi dan Sampel dalam Penelitian Kualitatif	<ol style="list-style-type: none"> 1. Populasi 2. Sampel 3. Teknik Sampling 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Teknik Pengambilan Populasi dan Sampel dalam Penelitian Kualitatif	Tes, tugas dan unjuk kerja	10
11	Mahasiswa dapat memahami Instrumen dan Teknik Pengumpulan Data dalam Penelitian Kualitatif	<ol style="list-style-type: none"> 1. Instrumen Penelitian Kualitatif 2. Teknik Pengumpulan Data 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Instrumen dan Teknik Pengumpulan Data dalam Penelitian Kualitatif	Tes, tugas dan unjuk kerja	10
12	Mahasiswa dapat memahami Teknik Analisis Data dalam Penelitian Kualitatif	<ol style="list-style-type: none"> 1. Analisis data sebelum di lapangan 2. Analisis Data Model Miles & Huberman 3. Analisis Data Model Spradley 4. Analisis Domain 5. Analisis Taksonomi 6. Analisis Komponensial 7. Analisis Tema Budaya 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Keuangan dalam Bisnis	Tes, tugas dan unjuk kerja	10

13	Mahasiswa dapat memahami Tata Cara Penulisan Proposal Penelitian pada Bab 1 Skripsi	<ol style="list-style-type: none"> 1. Latar Belakang Masalah 2. Rumusan Masalah 3. Tujuan Penelitian 4. Manfaat Penelitian 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Tata Cara Penulisan Proposal Penelitian pada Bab 1 Skripsi	Tes, tugas dan unjuk kerja	5
14	Mahasiswa dapat memahami Tata Cara Penulisan Proposal Penelitian pada Bab 2 Skripsi	<ol style="list-style-type: none"> 1. Pola penyajian Teori 2. Penyajian hubungan antar variabel 3. Penyajian Penelitian Sebelumnya 4. Kerangka Pemikiran Penelitian 5. Hipotesis Penelitian 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Tata Cara Penulisan Proposal Penelitian pada Bab 2 Skripsi	Tes, tugas dan unjuk kerja	5
15	Mahasiswa dapat memahami Tata Cara Penulisan Proposal Penelitian pada Bab 3 Skripsi	<ol style="list-style-type: none"> 1. Lokasi dan Obyek Penelitian 2. Identifikasi dan Definisi Operasional Variabel 3. Jenis dan Sumber Data 4. Metode Penentuan Sampel 5. Metode Pengumpulan Data 6. Tehnik Analisis 	Ceramah, diskusi, dan presentasi	150 menit tatap muka	Mahasiswa mendalami Tata Cara Penulisan Proposal Penelitian pada Bab 3 Skripsi	Tes, tugas dan unjuk kerja	5
16	Ujian Akhir Semester (Melakukan validasi penilaian akhir dan menentukan kelulusan mahasiswa)						

Keterangan :

1. Penjelasan istilah

- a. **Capaian pembelajaran lulusan/PLO:** capaian pembelajaran permatakuliah dalam rangka mencapai capaian pembelajaran dan profil program studi yang diharapkan.
- b. **Minggu ke :** menunjukkan kapan suatu kegiatan dilaksanakan, yakni mulai minggu ke 1 sampai ke 16 (satu semester)
- c. **Kemampuan akhir yang diharapkan/CLO:** capaian pembelajaran untuk setiap pertemuan (per pokok/ topik bahasan) yang disajikan pada minggu tertentu, dalam rangka mencapai capaian pembelajaran permatakuliah.

- d. **Bahan kajian/materi pembelajaran** : bisa diisi pokok bahasan/ sub pokok bahasan, atau topik bahasan (dengan asumsi tersedia diktat/ modul ajar untuk setiap pokok bahasan).
- e. **Metode/ bentuk pembelajaran**:metode pembelajaran yang dapat dipilih untuk pelaksanaan pembelajaran matakuliah meliputi: diskusi kelompok, simulasi, studi kasus, pembelajaran kolaboratif, pembelajaran kooperatif, pembelajaran berbasis proyek, pembelajaran berbasis masalah, atau metode pembelajaran lain, yang dapat secara efektif memfasilitasi pemenuhan capaian pembelajaran lulusan. Setiap matakuliah dapat menggunakan satu atau gabungan dari beberapa metode pembelajaran sebagaimana dimaksud dan diwadahi dalam suatu bentuk pembelajaran. Bentuk pembelajaran dapat berupa kuliah, responsi dan tutorial, seminar, dan praktikum, praktik studio, praktik bengkel, atau praktik lapangan.
- f. **WaktuBelajar** : takaran waktu yang menyatakan beban belajar dalam satuan sks (satuan kredit semester). Satu sks setara dengan 160 (seratus enam puluh) menit kegiatan belajar perminggu per semester.
- g. **Pengalaman belajar mahasiswa**: pengalaman belajar mahasiswa yang diwujudkan dalam deskripsi tugas yang harus dikerjakan oleh mahasiswa selama satu semester .
- h. **Kriteria penilaian/indikator**: berisi indikator yang dapat menunjukkan pencapaian kemampuan yang dicanangkan, atau unsur kemampuan yang dinilai (bisa kualitatif, misal ketepatan analisis, kerapian sajian, kreativitas ide, kemampuan komunikasi, bisa juga yang kuantitatif: banyaknya kutipan acuan/ unsur yang dibahas, kebenaran hitungan).
- i. **Bobot nilai** : disesuaikan dengan waktu yang digunakan untuk membahas atau mengerjakan tugas, atau besarnya sumbangan suatu kemampuan terhadap pencapaian kompetensi matakuliah.

Sumber penjelasan istilah:

1. Tim Kurikulum dan Pembelajaran, Direktorat Pembelajaran dan Kemahasiswaan Dirjen Dikti Kemendikbud. 2014.*Buku Kurikulum Pendidikan Tinggi*. Jakarta.
2. PermenRistekDikti No. 44 Tahun 2015 tentang Standar Nasional Pendidikan Tinggi.

Rincian Waktu 1 sks Kegiatan Pembelajaran

(Permendikbud No.49 Tahun 2014: pasal 16)

Pengertian 1 sks dalam bentuk pembelajaran

a Kuliah, Responsi, Tutorial

Tatap Muka	Penugasan Terstruktur	Belajara Mandiri
50 menit/minggu/semester	50 menit/minggu/semester	60 menit/minggu/semester

b Seminar atau bentuk pembelajaran lain yang sejenis

Tatap muka	Belajar mandiri
100 menit/minggu/semester	60 menit/minggu/semester

c Praktikum, praktik studio, praktik bengkel, praktik lapangan, penelitian, pengabdian kepada masyarakat, dan/atau bentuk pembelajaran lain yang setara

160 menit/minggu/semester

Pasal 15:

- (1) Beban belajar mahasiswa sebagaimana dimaksud dalam Pasal 10 ayat (2) huruf d, dinyatakan dalam besaran satuan kredit semester (sks).
- (2) Satu sks setara dengan 160 (seratus enam puluh) menit kegiatan belajar per minggu per semester.
- (3) Setiap mata kuliah paling sedikit memiliki bobot 1 (satu) sks.
- (4) Semester merupakan satuan waktu kegiatan pembelajaran efektif selama 16 (enam belas) minggu.

**Rincian Waktu 1 Sks Kegiatan Pembelajaran
(PermenRistekDikti No. 44 Tahun 2015: pasal 17)1**

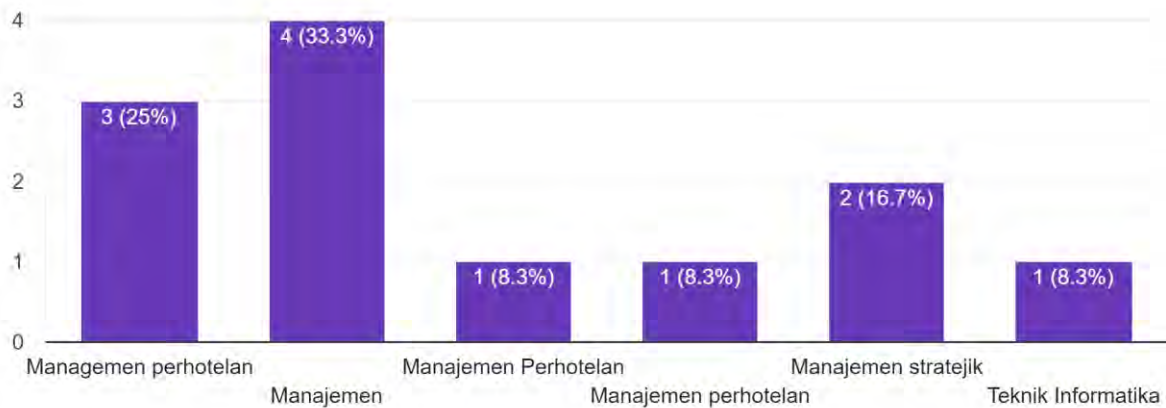
Pengertian 1 sks dalam bentuk Pembelajaran			
a	Kuliah, Responsi, atau tutorial		
	Tatap Muka	Penugasan Terstruktur	Belajar Mandiri
	50 menit/minggu/semester	60 menit/minggu/semester	60 menit/minggu/semester
b	Seminar atau bentuk pembelajaran lain yang sejenis		
	Tatap Muka	Belajar Mandiri	
	100 menit/minggu/semester	70 menit/minggu/semester	
c	Praktikum, praktik studio, praktik bengkel, praktik lapangan, penelitian, pengabdian kepada masyarakat, dan atau bentuk pembelajaran lain yang setara		
	170 menit/minggu/semester		
Pasal 15:			
<p>(1) Beban belajar mahasiswa sebagaimana dimaksud dalam Pasal 10 ayat (2) huruf d, dinyatakan dalam besaran sks.</p> <p>(2) Semester merupakan satuan waktu proses pembelajaran efektif selama paling sedikit 16 (enam belas) minggu, termasuk ujian tengah semester dan ujian akhir semester.</p> <p>(3) Satu tahun akademik terdiri atas 2 (dua) semester dan perguruan tinggi dapat menyelenggarakan semester antara.</p> <p>(4) Semester antara sebagaimana dimaksud pada ayat (3) diselenggarakan:</p> <p style="margin-left: 20px;">a. Selama paling sedikit 8 (delapan) minggu;</p> <p style="margin-left: 20px;">b. Beban belajar mahasiswa paling banyak 9 (Sembilan) sks;</p> <p style="margin-left: 20px;">c. Sesuai beban belajar mahasiswa untuk memenuhi capaian pembelajaran yang telah ditetapkan.</p> <p>(5) Apabila semester antara diselenggarakan dalam bentuk perkuliahan, tatap muka paling sedikit 16 (enam belas) kali termasuk ujian tengah semester antara dan ujian akhir semester antara.</p>			

**Response from Lectures of Dhyana Pura University
Management Study Program, Faculty of Economy and Humanity
4th August 2019**

A. Effective Level

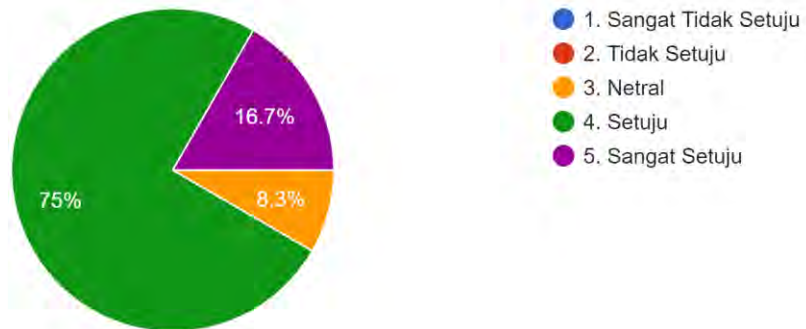
Program Studi

12 responses



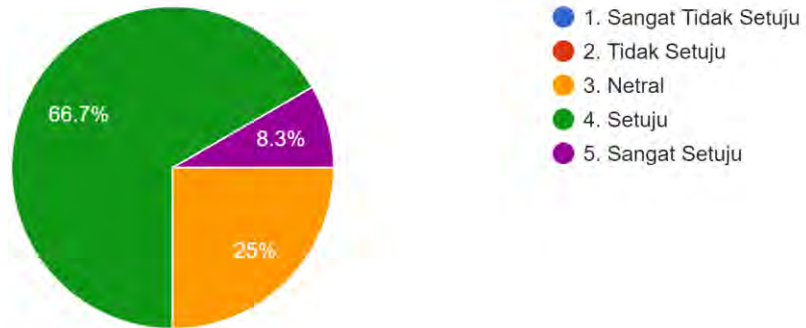
1. Anda pernah menggunakan pengajaran e-learning / online di kelas

12 responses



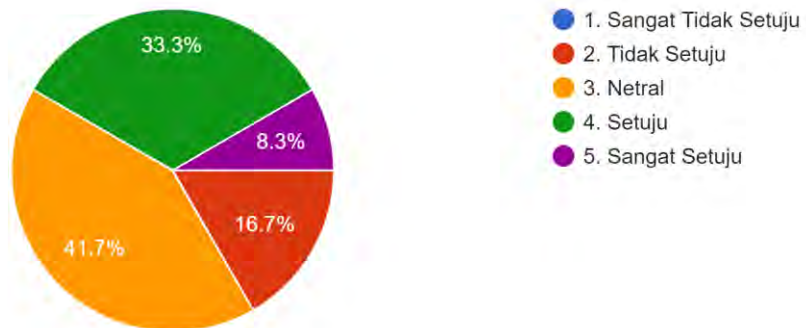
2. Anda mudah menggunakan e-learning / online learning sebagai media pengajaran

12 responses



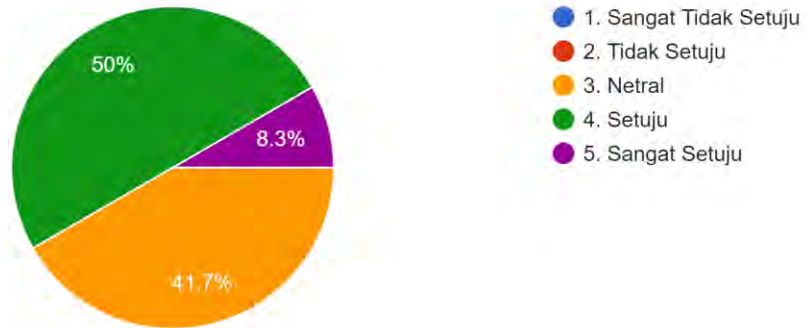
3. E-learning / online learning lebih menarik dibandingkan dengan pembelajaran konvensional

12 responses



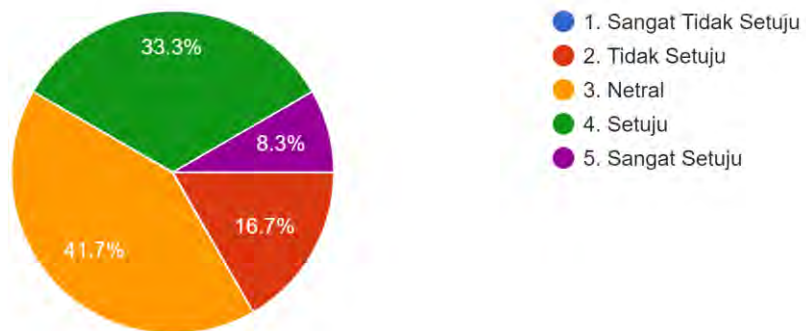
4. E-learning / online learning lebih fleksibel dibandingkan dengan pembelajaran konvensional

12 responses



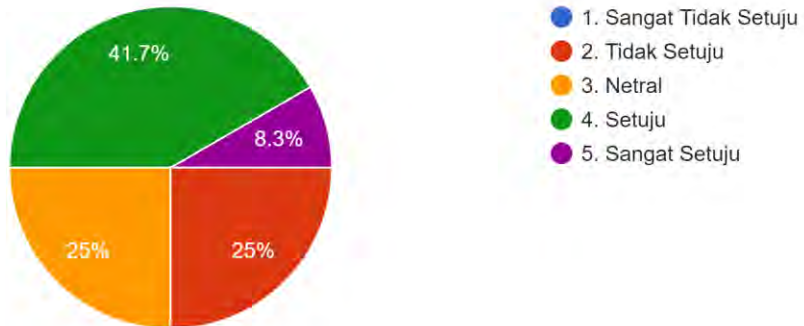
5. Capaian Pembelajaran Lulusan tercapai secara optimal dengan E-learning / online learning

12 responses



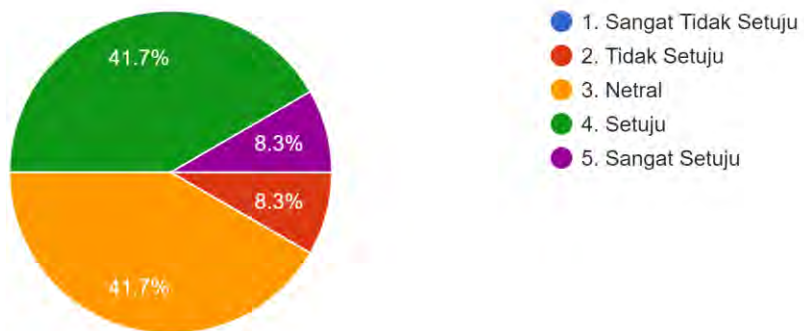
6. Anda lebih puas mengajar dengan menggunakan e-learning / online learning

12 responses



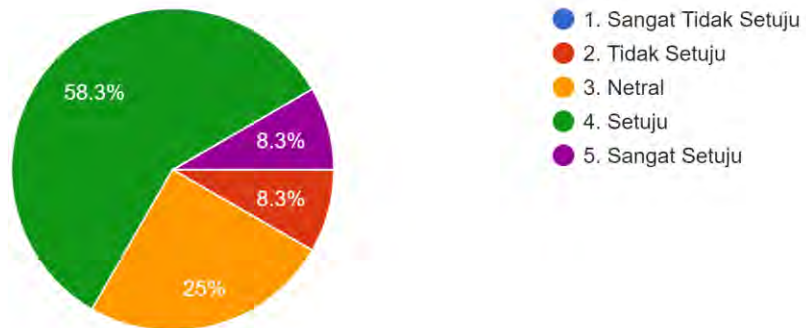
7. E-learning / online learning lebih efektif dibandingkan dengan pembelajaran konvensional

12 responses



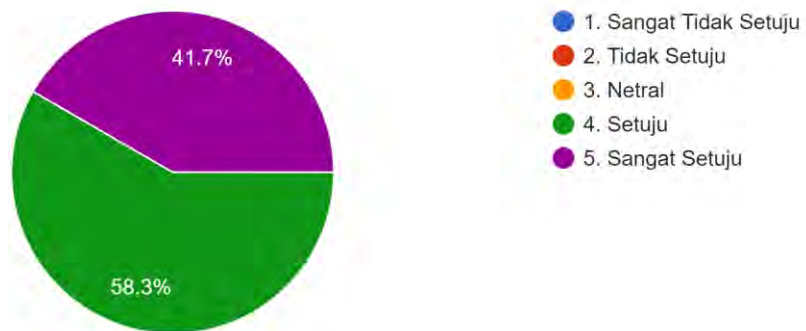
8. E-learning / online learning meningkatkan kualitas pengajaran dan pembelajaran

12 responses



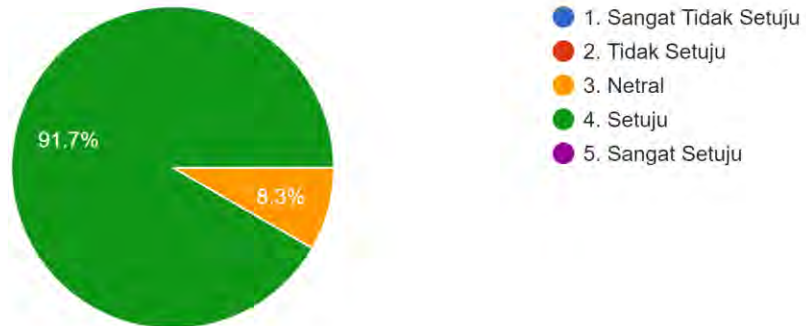
9. Konten (gambar, audio, video, dan animasi) di media e-learning membantu proses mengajar

12 responses



10. Mudah memberikan umpan balik / learning feedback dengan e-learning / online learning

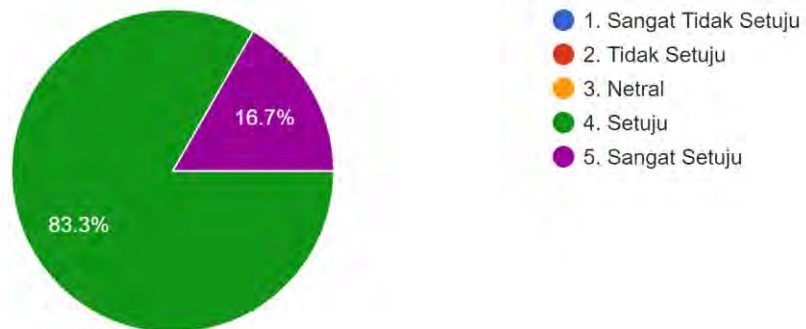
12 responses



B. Motivation

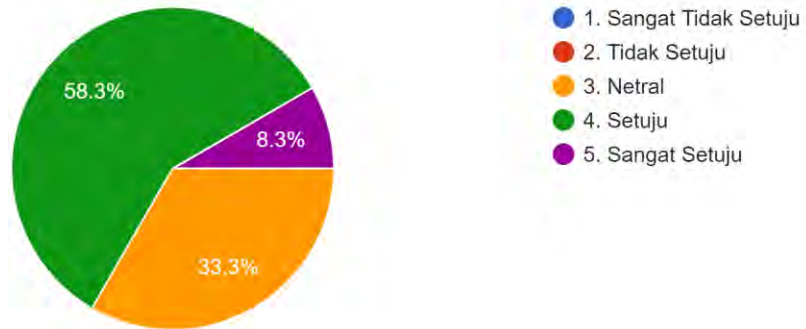
1. Anda tertarik menggunakan e-learning / online learning

12 responses



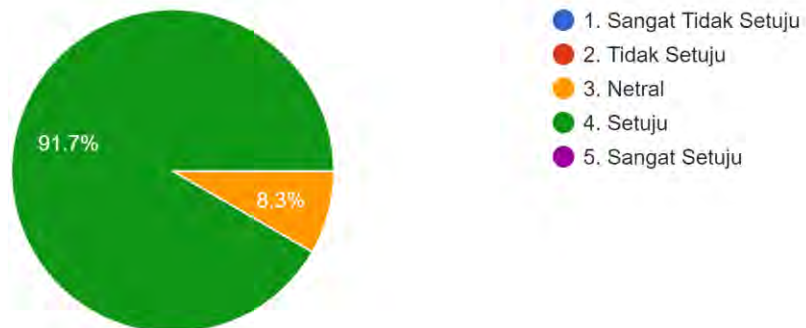
2. Anda termotivasi untuk mengajar dengan e-learning / online learning

12 responses



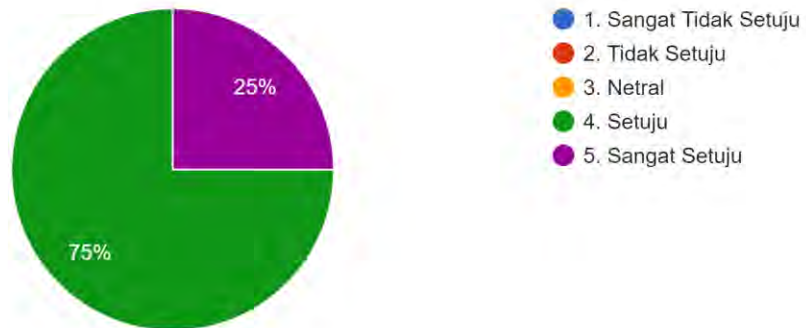
3. Anda tertarik dengan fitur-fitur aplikasi e-learning / online learning

12 responses



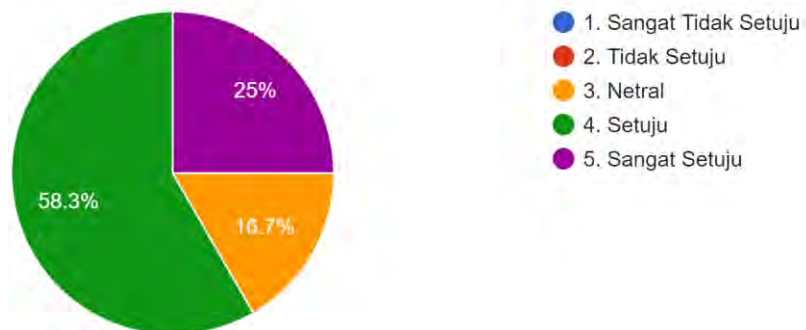
4. Anda tertarik memanfaatkan konten-konten pendukung (gambar, audio, video, dan animasi) yang tersedia

12 responses



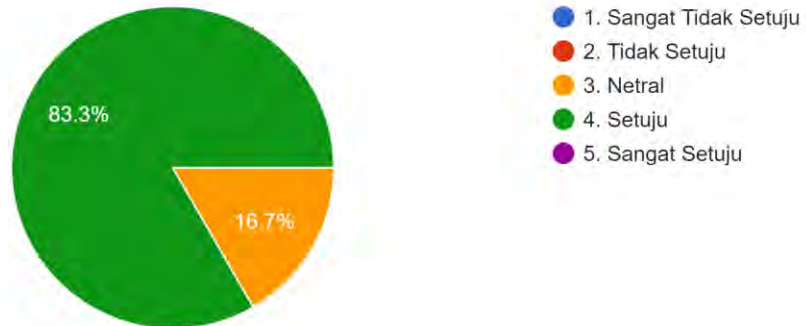
5. E-learning / online learning membuat proses pengajaran yang bervariasi

12 responses



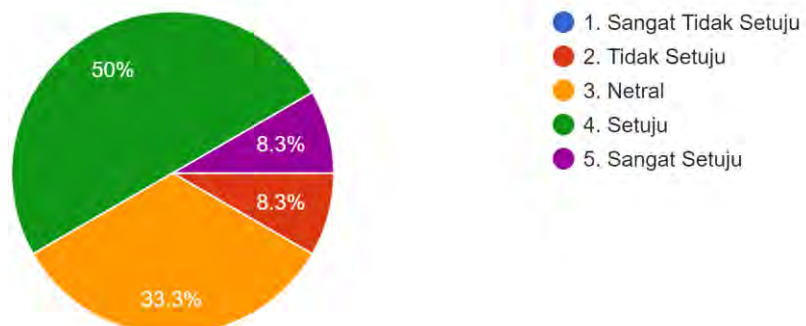
6. Fitur-fitur aplikasi e-learning / online learning meningkatkan rasa ingin tahu Anda

12 responses



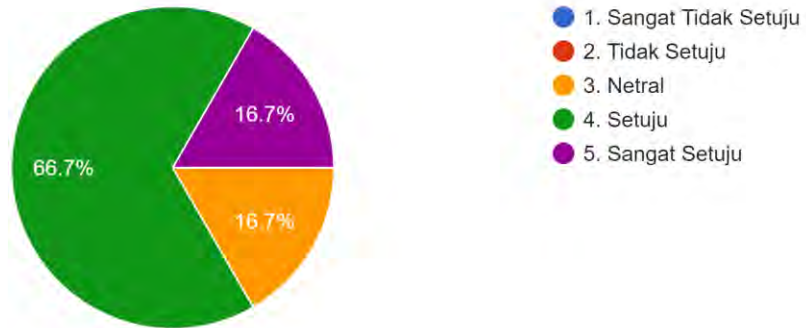
7. E-learning/online learning meningkatkan rasa percaya diri dosen

12 responses



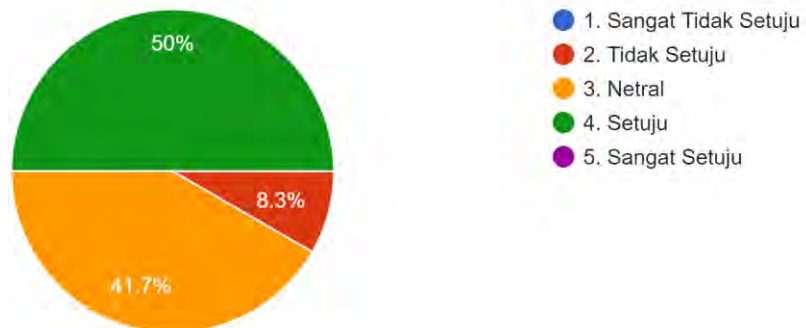
8. E-learning / online learning meningkatkan kemampuan dosen dalam pemanfaatan teknologi

12 responses



9. Evaluasi dan analisis proses pembelajaran lebih mudah

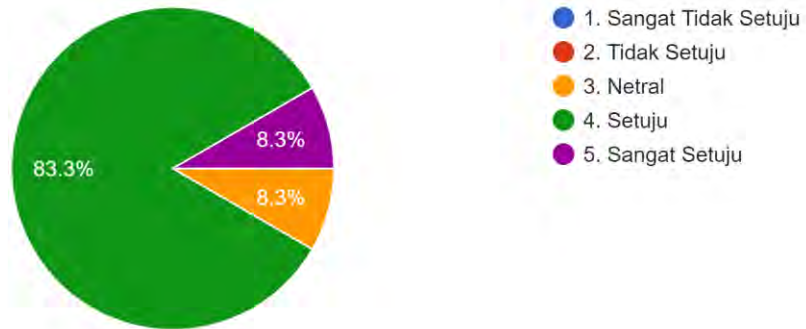
12 responses



C. Readiness Level

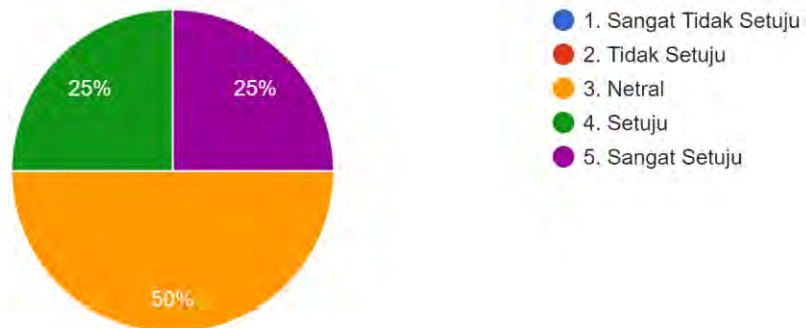
1. Anda siap menggunakan e-learning / online learning

12 responses



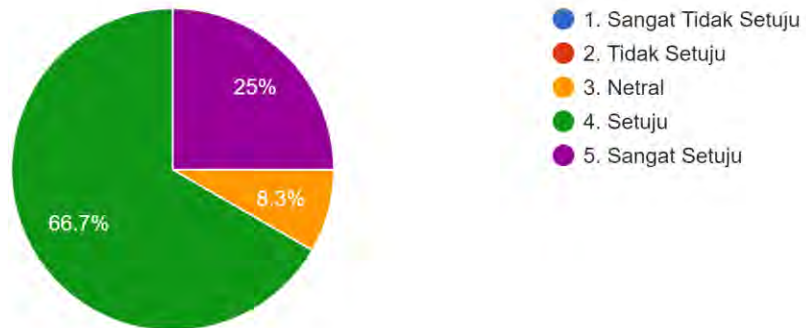
2. Anda dapat mengakses internet di kampus dan di luar kampus

12 responses



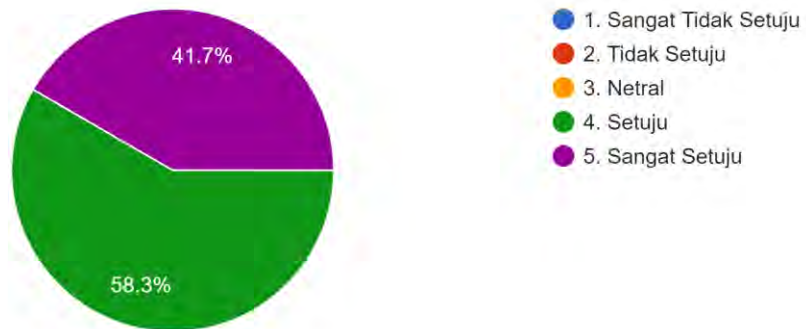
3. Anda menyediakan waktu (15,30, atau 60 menit) untuk belajar fitur – fitur aplikasi e-learning / online learning

12 responses



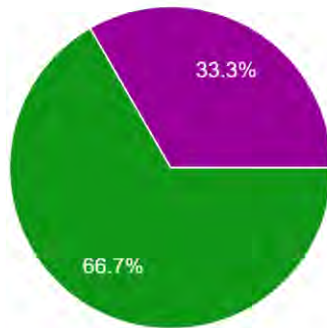
4. Anda memiliki kemampuan komputer dasar, seperti mengetik, membuat, menyimpan, menyunting file, dsb.

12 responses



5. Anda memiliki kemampuan internet dasar, seperti e-mail, searching, download, dsb

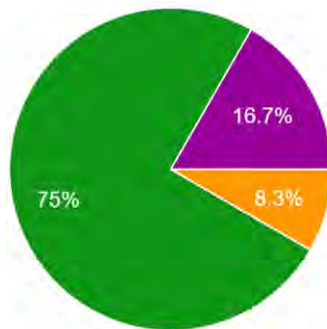
12 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

6. Anda siap menggunakan teknologi informasi untuk mengevaluasi tugas-tugas setiap hari

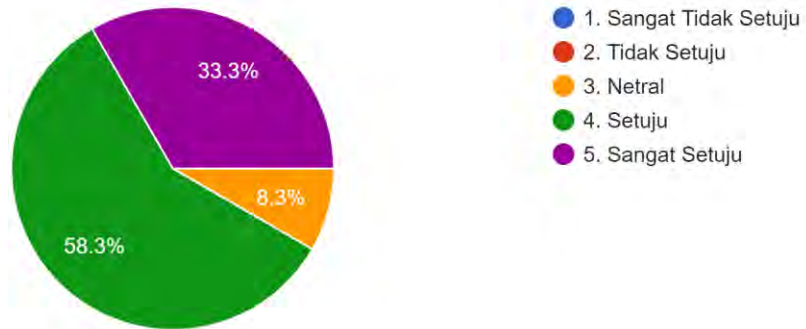
12 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

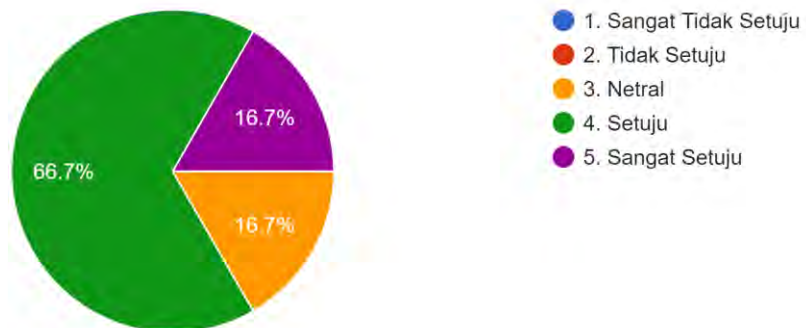
7. Anda siap menerima pembaharuan teknologi

12 responses



8. E-learning / online learning dijadikan program unggulan dalam proses pembelajaran

12 responses

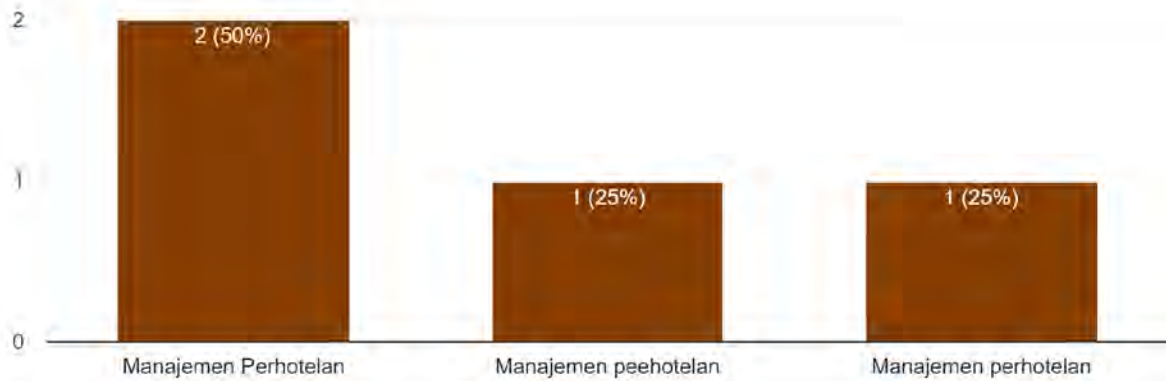


RESPONSE OF STUDENTS OF DHYANA PURA UNIVERSITY MANAGEMENT STUDY PROGRAM

A. Effective Level

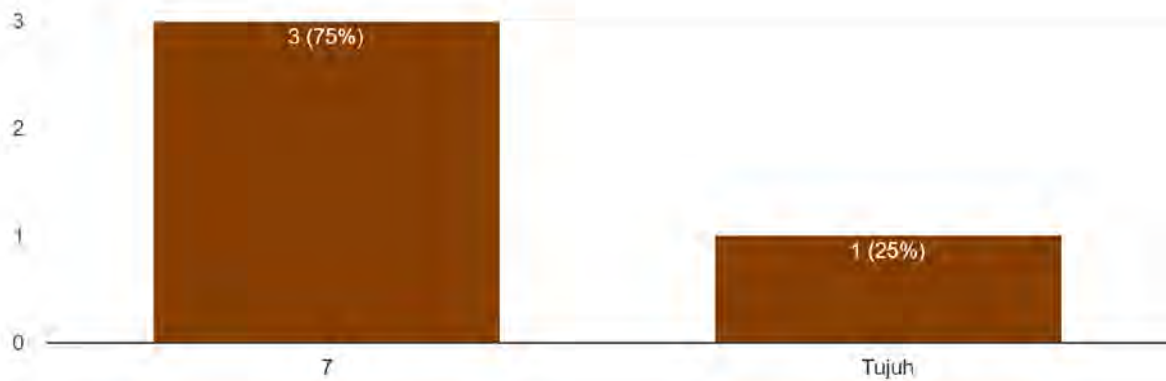
Mahasiswa Program Studi

4 responses



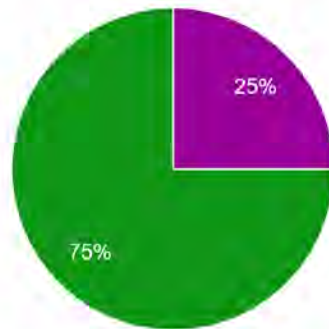
Semester

4 responses



1. Anda tahu mengenai media pembelajaran e-learning / online learning

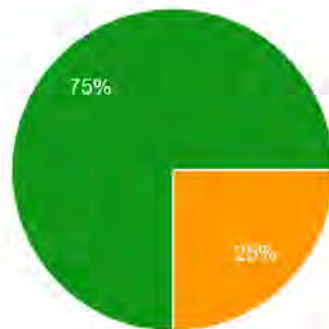
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

2. Anda pernah menggunakan media pembelajaran e-learning / online learning

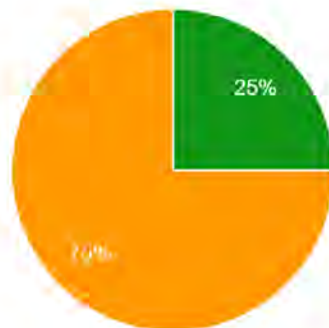
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

3. Anda mudah menggunakan media pembelajaran e-learning / online learning

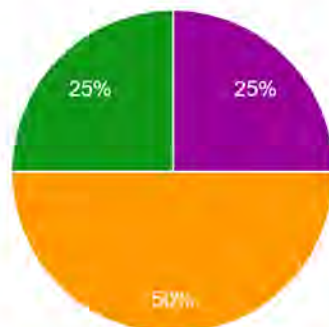
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

4. Kegiatan belajar anda lebih fleksibel dengan e-learning / online learning

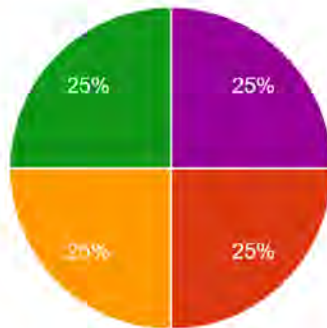
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

5. Anda dapat mencapai hasil belajar yang optimal dengan menggunakan media pembelajaran e-learning / online learning

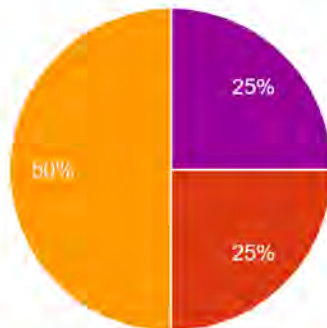
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

6. Anda puas dengan e-learning / online learning

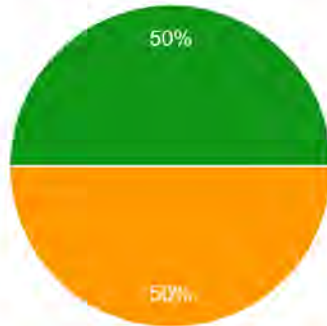
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

7. E-learning / online learning membantu anda untuk belajar lebih efektif

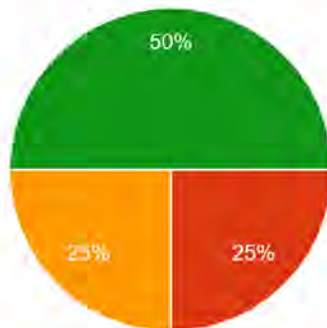
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

8. E-learning / online learning dapat meningkatkan kualitas pembelajaran

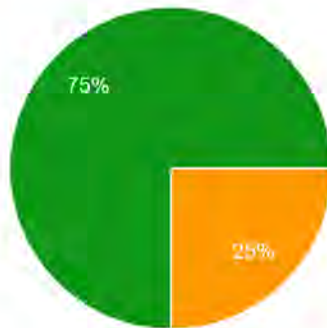
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

9. Ragam konten (gambar, audio, video, dan animasi) pada e-learning / online learning membantu proses belajar

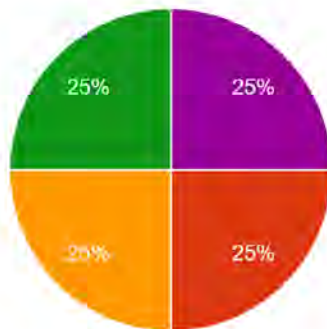
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

10. Mudah memberikan umpan balik / learning feedback dengan e-learning / online learning

4 responses

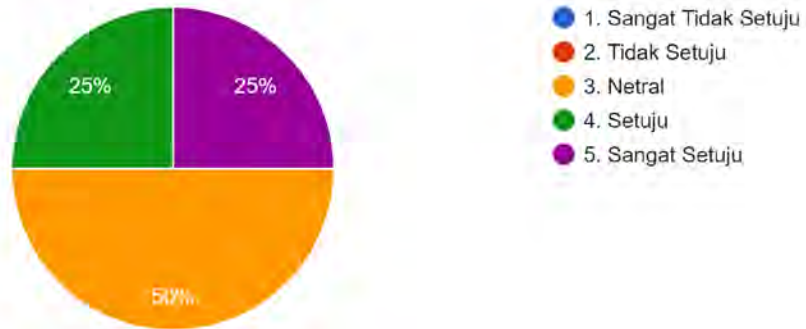


- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

B. Motivation

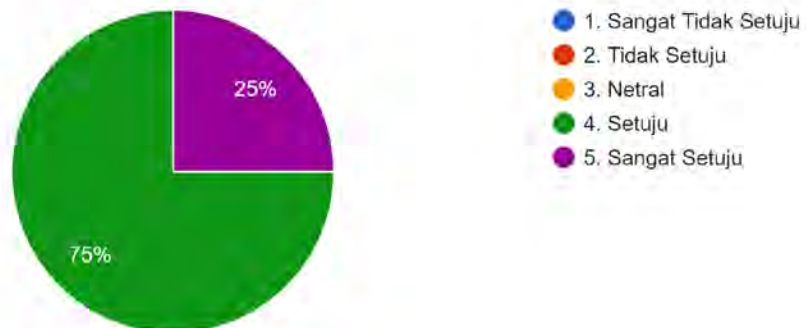
1. Anda tertarik menggunakan e-learning / online learning

4 responses



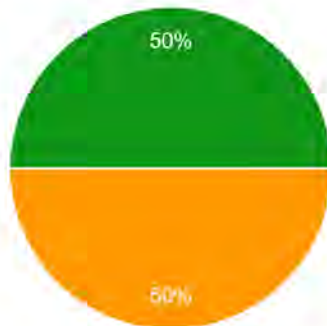
2. Anda termotivasi untuk belajar dengan e-learning / online learning

4 responses



3. Anda tertarik belajar karena fitur-fitur yang disediakan pada e-learning / online learning

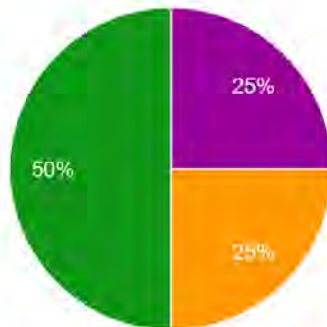
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

4. Anda tertarik belajar menggunakan e-learning / online learning karena tersedianya ragam konten (gambar, audio, video, dan animasi)

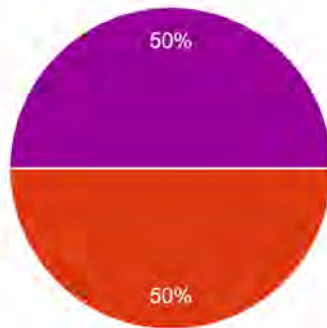
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

5. E-learning / online learning mendorong anda untuk mencari referensi materi di Internet

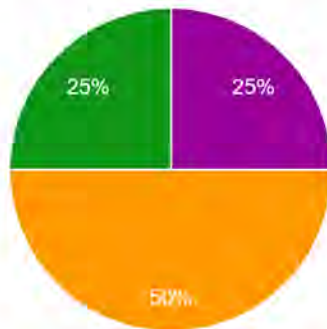
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

6. E-learning / online learning meningkatkan minat anda untuk belajar

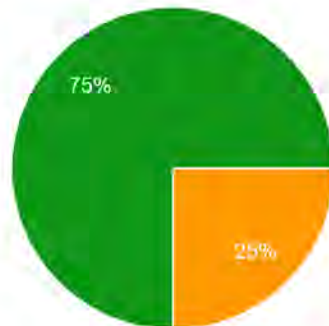
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

7. Fitur-fitur pada media pembelajaran e-learning meningkatkan rasa ingin tahu anda

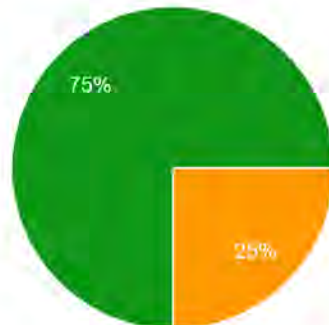
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

7. Fitur-fitur pada media pembelajaran e-learning meningkatkan rasa ingin tahu anda

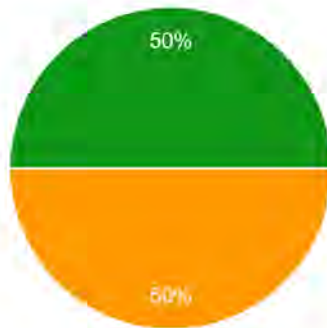
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

8. Pembelajaran menggunakan e-learning / online learning meningkatkan rasa percaya diri anda

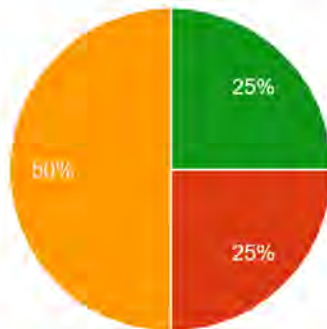
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

9. Anda puas belajar dengan media e-learning / online learning

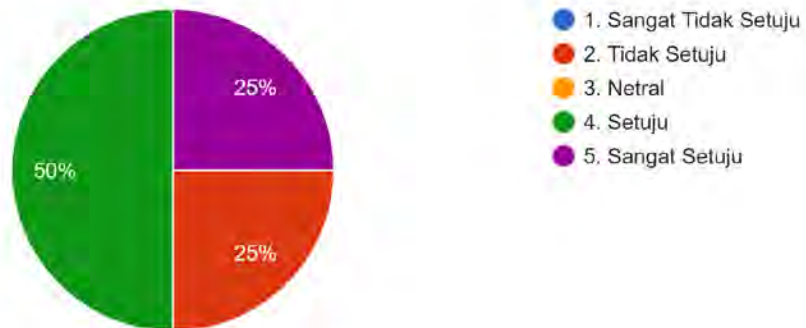
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

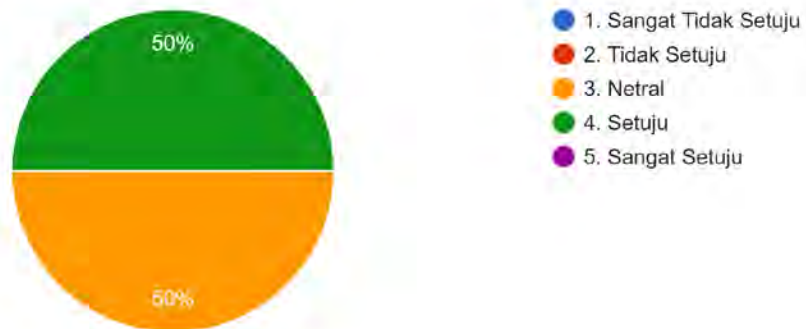
10. E-learning / online learning meningkatkan kemampuan anda dalam pemanfaatan teknologi

4 responses



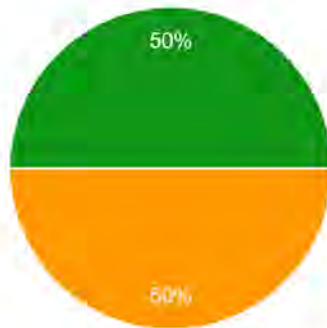
11. E-learning / online learning meningkatkan kemandirian anda dalam belajar

4 responses



12. E-learning / online learning memudahkan anda melakukan diskusi online dengan dosen dan atau sesama mahasiswa

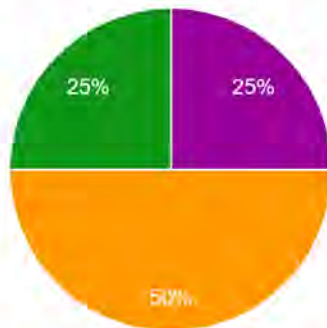
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

13. E-learning / online learning membuat proses pembelajaran lebih praktis

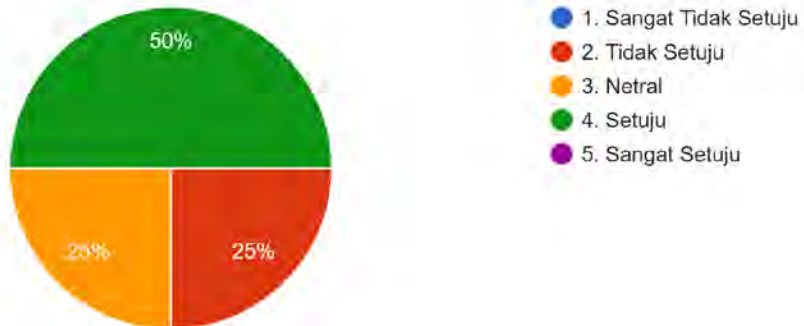
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

14. E-learning / online learning membuat proses pembelajaran lebih fleksibel

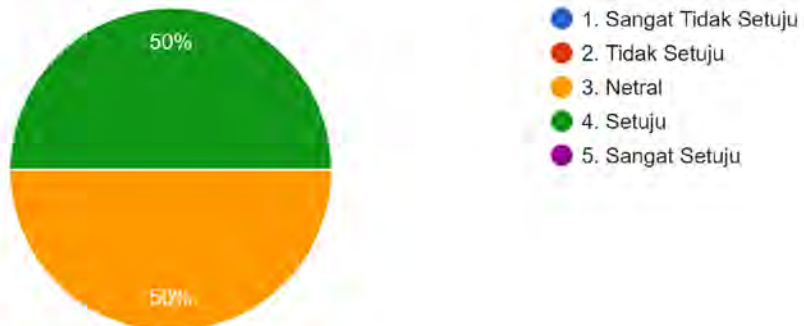
4 responses



C. Readiness Level

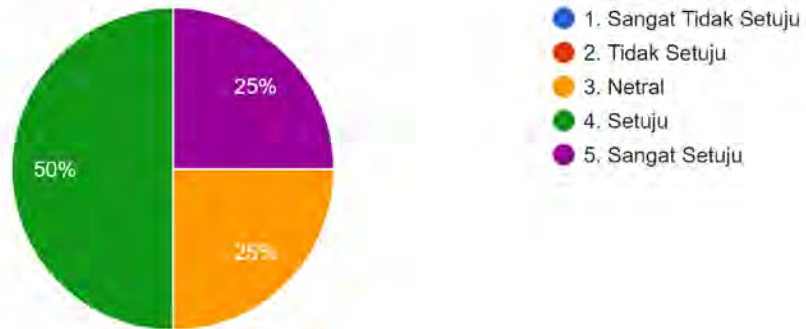
1. Anda siap mengikuti e-learning / online learning

4 responses



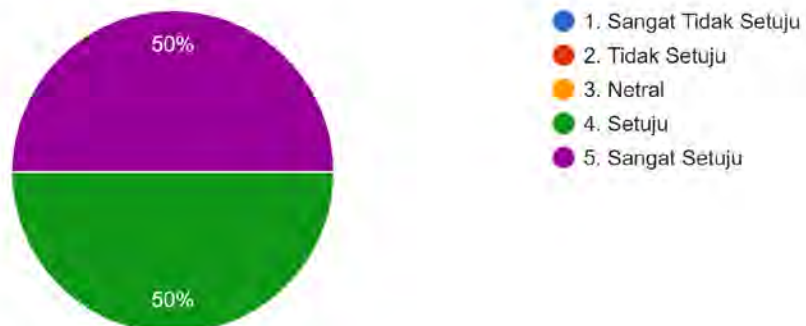
2. Anda dapat mengakses internet di kampus dan di luar kampus

4 responses



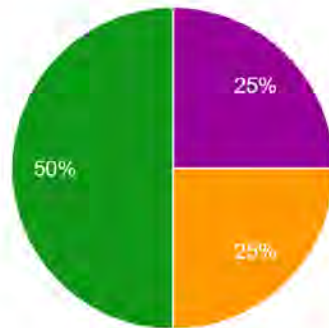
3. Anda memiliki kemampuan komputer dasar, seperti membuat, menyimpan, menyunting file, dsb.

4 responses



4. Anda memiliki kemampuan internet dasar, seperti e-mail, searching, download, dsb.

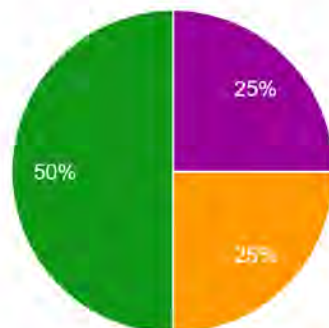
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

5. Anda siap menggunakan teknologi informasi dalam proses belajar

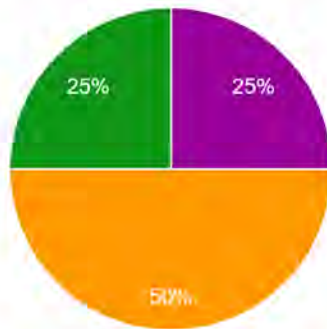
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

6. Anda siap menggunakan pembaharuan teknologi

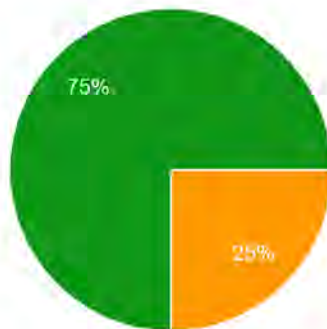
4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju

7. E-learning / online learning sebagai program unggulan dalam proses pembelajaran

4 responses



- 1. Sangat Tidak Setuju
- 2. Tidak Setuju
- 3. Netral
- 4. Setuju
- 5. Sangat Setuju



Jakarta, July 1st 2019,

Letter No : 005/ WISHY/VII/2019
Subject : Invited Speaker Invitation

Dear
Ir. Linawati, M.Eng.,PhD

On behalf of the committee of the WISHY Congress 2019 by IEEE Indonesia Section, I am very pleased to have the honour of inviting you as our invited speaker to deliver "Accelerating Humanitarian Technology Growth in Eastern Indonesia."

The WISHY Congress is the flagship event by IEEE Indonesia Section which is regularly organized per two years. The congress is for Women in Engineering, Industrial Relation, Students, Humanitarian Technology and Young Professional Affinity Group under IEEE Indonesia Section. This year, the theme of the congress is "Strengthening Engineering Competence by Enhancing Technology Literacy for Eastern Indonesia." The event will be organized in Makasar at

Thursday, August 1st 2019
09.00 am – 6 pm
Four Point Hotel, Makasar

Please Let me know at your convenience if you will be able to join us for the event

We would be honoured if you would accept this invitation. Thank you for your attention and we are looking forward for your positive response.

Sincerely yours,

A handwritten signature in black ink, appearing to be "Dr. Nur Afny C. Andryani", written over a light blue grid background.

Dr. Nur Afny C. Andryani., MSc
General Chair of WISHY Congress 2019



IEEE
INDONESIA SECTION

CERTIFICATE

Of Appreciation

THIS IS TO CERTIFY THAT

Ir. Linawati, M.Eng.Sc., Ph.D

ACTIVELY PARTICIPATED IN IEEE INDONESIA SECTION WOMEN IN ENGINEERING,
INDUSTRY RELATION, STUDENT, HUMANITARIAN, YOUNG PROFESSIONAL CONGRESS 2019
(WISHY CONGRESS 2019) WITH THEME "STRENGTHENING ENGINEERING COMPETENCE
BY ENHANCING TECHNOLOGY LITERACY FOR EASTERN INDONESIA" AS A **SPEAKER**

AT THE DATE OF 1 AUGUST 2019 IN PLACE FOUR POINTS HOTEL BY SHERATON
MAKASSAR - INDONESIA

DR. KURNIANINGSIH, S.T., M.T.

VICE CHAIR OF IEEE INDONESIA SECTION

DR. NUR AFNY C. ANDRYANI

CHAIR OF IEEE INDONESIA SECTION WISHY CONGRESS 2019

Proposed Plugin for Collaborative Game-Based Learning

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Abstract— Utilizing Moodle Learning Management System (LMS) as a tool to support Collaborative Learning has become more popular. This Computer-Supported Collaborative Learning (CSCL) concept is proven to be more effective than the traditional approach for which interaction and collaboration between students are generally not easy. Along with Moodle LMS popularity as CSCL tools, there are several trends about integrating Game-Based Learning with a Collaborative approach. This Collaborative Game-Based Learning resulted in various positive impacts such as increased effectiveness in learning performance and motivation. Moodle itself has a popular game plugin that didn't share features and type of Game-Based Learning concepts such as narrative design, visual graphics, incentive, and sound integration. This paper proposes an "upgrade" to Moodle game plugin into a Collaborative Game-Based Learning Plugin by utilizing WebSocket technology. The plugin serves a multiplayer system which will be a core of Collaborative Learning.

Keywords— Moodle, Plugin, Game-Based Learning, Collaborative Learning

I. INTRODUCTION

One of the key strategies to enable education for the student was the implementation of learning technologies such as Moodle Learning Management System (LMS) or Moodle E-Learning [1]. Moodle is one of an e-learning platform that utilizes an open-source license that enables researchers, hobbyists, and communities to implement new features and ideas by expanding its features through its plugin system [2]. With more than 160 million users registered and 100.000 sites registered in Moodle official website [3] made Moodle become the most popular Learning Management System in Europe[4].

Collaborative Learning (CL) is an instructional teaching strategies that promotes higher-order thinking, socially acceptable behavior, and interracial acceptance [5]. Merits that CL has, becomes the most explored teaching strategies in the history of educational researches[6]. Along with that achievement, the pace of new technology for learning like Moodle LMS made the typical example of non-traditional learning strategies that based on interaction of student such as CL was supported very well and providing new topics into

educational research that called Computer-Supported Collaborative Learning (CSCL) [7]. Some studies found that this new kind of CSCL approach can be more effective than traditional approaches for which interactions and collaboration between students are generally not allowed [8].

The integration of Collaborative Learning into Moodle LMS resulted in various outcomes. Recent research shows Moodle as CSCL tools helped the student to improve their knowledge construction during the teaching and learning process [9]. Another research stated that using Moodle to support the collaborative learning class helped the foreign language study group doing the group work, and assessment structure easier [10].

Media technologies also gain some traction of popularity as a teaching medium. For example, usage of video games as a learning strategy in class using Kinect device[11], or integrating language evaluation through mobile game [12]. Using video games as a teaching medium described in one concept called Digital Game-Based Learning by Prensky [13]. He stated that this digital game-based learning can help the student to achieve "student-driven" learning, where the knowledge can be learned independently through the worldwide distribution of video games. In another context, some researchers found that the application of Game-Based Learning not only provides an independent type of learning but also could be an effective way to attract motivation in student learning activity [14]–[16].

The collaborative Game-Based Learning approach is a research field that also gain trend recently. As an example, research about the usage of Multi-touch tabletop collaborative game (MTCG) as a collaborative learning platform resulted in a more engaging experience to student learning progress[17]. Another research is implementing Collaborative Game-Based Learning using grid-based mind-tools that show significant effectiveness in students learning performance [18]. Those researches concluded into the same points that the Game-Based Learning approach offers an escalation in student learning performance, motivation and engagement.

Moodle itself has a Game Plugin [19] which is placed on 6th for the most downloaded plugin in the last 12 months [20]. Following Prensky's research about Game-Based Learning, Plass in 2016 explained what and how a game can be built into Game-Based Learning type, including its features and blending the learning process into the game [21]. Currently, this Moodle game plugin didn't have features that Plass proposed such as, narrative design, learning and incentive mechanism, sound integration, and good graphic visualization.

Looking at what Collaborative Game-Based learning offers for student learning motivation, and easiness of integration for new system features through Moodle Plugin. This paper aims to propose the design of Moodle Game Plugin for Collaborative Game-Based Learning type. Then a general view about the integration of collaboration and game-based learning into Moodle LMS can be presented.

II. LITERATURE REVIEW

A. Moodle Plugin System

Moodle Learning Management System (LMS) designed with a core that can be extended to adapt the learning process or user needs by implementing the plugin. This plugin system allows the user to modify the system behavior without considering the changes that will break the system because the customization is done on the top of the General Core API.

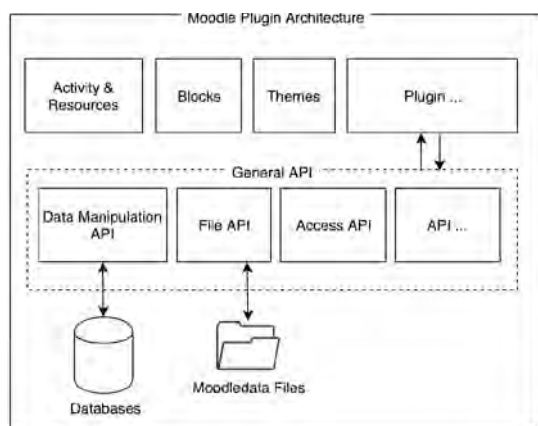


Fig. 1. Moodle Plugin Architecture

Figure 1 explains how the Moodle LMS plugin system works. The concept is, the developed plugin will be located in separate locations by its types and communicate or access the required information on the system via General API. Based on its online documentation about General API [22], Moodle Core serves approximately 41 API Calls that currently have a 11 Most Used API such as, Access API to manages the authentication, Data Manipulation API to access the database, File API to access Moodledata files like picture or video, Form API to handle user data via web forms, Logging API to access the events logging, Navigation API to manipulate the page navigation, Page API to configure how user will see information, Output API for rendering the view pages, String API to use the language function of the Moodle System, Upgrade API, and Moodlelib API which is the central library file of miscellaneous general-purpose Moodle functions like handling of request parameters, and co. Also

on Figure 1, you can see at the top of the General API part diagram, several plugins are separated by types. The Moodle LMS version 3.6 that we use as an example in this paper supports up to 50 types of plugins [23], and among this list, several plugin types officially supported and will be available for every future release. This officially supported plugin is intended to be the default plugin to do the basic functionality of Moodle as the Learning Management System.

This default plugin such as Activities and Resources Type that works as a foundation plugin to do the teaching stuff, Blocks Type that can be used to modify the system menus and interface information, Themes Type to modify the Moodle web appearances, Language Packs Type that obviously to support the language translation, Course Formats Type that used to control the course, Authentication Type that serve the authentication function, Enrollment Plugin that used to manages the user level and course enrollment, Repository Type to that used to do access to Moodledata like upload or download.

B. Collaborative Learning

Collaborative learning focuses on comparing outcomes of both collaborative and individual works to promoting the engagement of students in their learning process [24]. Researches in these fields have proven that for a collaborative approach to be effective five conditions should be satisfied [25], i.e. positive interdependence, individual accountability, promoted interaction, social skills, and group processing. Collaborative learning and cooperative learning that was applied for two groups of master students were based on the Moodle platform's e-learning tools. The Moodle tools which were used in this learning are Forum tool, Real-time text chat tool, and quiz tool. Practical projects were for cooperative learning.

Collaborative learning which is in conjunction with context of e-learning - computer-supported collaborative learning, includes several concepts, such as the ability to have a good social rapport between the members of the group; the ability to interact within the members and to express their ideas; and the ability to create an educational community of people possessing certain knowledge. The collaborative learning can be expressed in the following way, team teaching, team research work, brainstorming sessions, role-playing games, problem-based learning, project-based learning, debates, the Jigsaw method, case study, etc.

C. Game-Based Learning

The game in this paper is attributed to Video Game or Digital Game. Video Game is a digital form of playing that includes audiovisual and interactive method to deliver a story or a mechanism of a game[26]. The video game also defined as a system that involved its user into an artificial conflict that designed in a set of rules and resulted in an output that can be measured [27]. A study about video game consumption in America shows that 99% of boys and 94% of girls were ever been playing video games [28]. Seeing its popularity among youth and the possibility to integrate learning into the video game, made research defines a concept about this integration named Game-Based Learning (GBL). Game-based Learning as a learning media must have an equilibrium between the learning process and game model in its design to achieve the learning outcomes. Therefore the

Collaborative Learning Implementation for Possibility of Effective Credit Transfer

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Abstract—As a developing country, Indonesia faces learning quality problem among more than 4,600 higher education institutions that accommodate about 6 millions students. This problem is caused by different qualities and capacities of resources among the institutions. To respond the problem, a collaborative learning with blended - flipped classroom between Udayana University and Sam Ratulangi University for post-harvest engineering subject is proposed in this study. In addition, a collaborative learning is analyzed for possibility credit transfer program. Then Moodle as a Learning Management System is applied for the e-learning platform. Post-harvest Engineering subject is chosen and it is a course for a bachelor degree at the department of agricultural technology. The blended – flipped learning is selected as a learning model to achieve effective learning process and good outcomes of the course. The collaboration learning between the two universities students was commenced with discussions and arrangements among all facilitators or lecturers of both sides on learning outcomes, learning design, and semester learning plan. Impressive results of learning implementation have been achieved in term of students' performance, students' scores and grades. Both students of Udayana University and Sam Ratulangi University showed very positive perception toward the course. This perception has positive correlation with their grade, scores, feedbacks, and comments. Amazingly the grades, the scores, and the evaluation results are almost the same between both universities students. Therefore the same good quality standard of learning has been achieved. In addition the students went through new learning experiences which are matched to the expected learning outcomes. Finally, a credit transfer system between the two universities is strongly possible to apply.

Keywords—collaborative learning, blended learning, flipped learning, postharvest engineering, credit transfer

1 Background

No doubt that technology based learning can significantly help to implement collaborative learning successfully [1], [2], [3]. The outputs of the learning are positive results in term of students' performance both as in person and in groups. Then benefits and challenges of collaborative Learning at Engineering Universities is explained in [4]. One of benefits is great education possessing not only professional skills but also being able to collaborate with overseas colleagues without any assistance. The collaborative learning, flipped classroom, blended learning, and other learning method are mostly utilized using Learning Management Systems (LMSs). Most higher education institutions have implemented many type of LMSs to manage their online courses, with Moodle as one of the most favored LMS [4], [5], [6]. Moodle is highly suitable for collaboration learning and high opportunities to develop its features [7]. Often the collaboration has been limited to curriculum design, or collaboration of teachers and academics to develop disciplinary texts or other specific materials. An understanding of the cultural elements of each organization and the nature and effectiveness of interaction within the collaborative group are key points to make the collaborative learning success. The Authors [7] found that schools and universities have similar educational objectives and pedagogies that can be examples of effective collaboration between them.

Other method that must use technology for learning is flipped classroom. The flipped classroom is actually focused on pedagogical model [8], which learning material is explored outside of class by students. Generally, today class put material on line which is easily accessed by the students. Thus, ICT plays important role in the flipped classroom. Then video conference and multimedia usage cause that flipped classroom has been successfully implemented for short course [9]. Additionally Moodle is selected to facilitate the flipped model in a virtual learning environment [6].

On the other hand definitions of blended learning and flipped learning model are explored by [10]. A flipped classroom permits teachers to employ new technique or method in learning process. It shifts from teacher-centered learning to student – centered learning, and from individual to collaborative learning. In addition the utilization of extra activities is included in the flipped learning model for both individual and collaborative learning. Therefore the students have been applied active learning which is recognized as flipped learning technique [8]. On the other hand, in higher education environment, tough economy is a factor that pushing the education toward blended learning and flipped classroom model. Thus blended learning approach of the flipped classroom is suggested to apply for higher education to fulfill both individual and organization target. Adaptive collaborative learning system needs both individual adaptation and dynamic group formation [11] which be useful in scenarios of face-to-face learning, blended learning or online learning.

In a global higher education, credit transfer and inter-institutional student mobility become international trends. Learning outcomes have become significant part of this trend in institutional, curricula and pedagogical reform having profound effects on all aspects of curriculum development, implementation and evaluation [12]. The efficiencies gained through credit transfer systems for higher education and for students

are well understood in many places around the world. Various options, mechanisms and practices for the credit transfer of e-learning by Russian universities were revealed during the monitoring of their legal acts placed in the open sources [13]. Again in [14] states that learning outcomes have become an integral part of the global trend in higher education reform and are employed in three interconnected areas: (1) quality assurance, (2) teaching and learning, and (3) transfer credit. Establishing to what degree two courses are equivalent is not a trivial exercise. For example, here are two calendar descriptions of chemistry courses that come from the same educational jurisdiction, i.e. Chemistry course A and B. Yet, one course is a senior high school chemistry course and the other is an introductory general chemistry course at a university. The presence of learning outcomes is clearly an advantage in assessing transfer credit, but they must also be stated in a common language that is understood by both sending and receiving institutions.

In this digital era, e-learning and m - learning are commonly implemented in most universities, especially in renowned universities, as well as in Indonesia. Beginning of year 2019, the Ministry of Research Technology and Higher Education of Indonesia has released its national recommendation for all higher education institutions to implement e-learning such as blended learning in the classroom [15]. This national recommendation is appropriate solution for Indonesia as the largest archipelagic country which is made up of more than 17,000 islands of which about 6,000 islands inhabited by people. Indonesia is also the fourth most populous country with about 230 million inhabitants [16]. In term of higher education, Indonesia has more than 4,600 higher education institutions both public and private institutions for about 6 millions students [17]. These facts cause various qualities and capacities of resources among the institutions. Most institutions in west part of Indonesia have better resources than the eastern part. Therefore a problem with learning quality among the institutions should be questioned. The quality problem arises because of low monitoring and evaluating of whole learning process. Therefore, we propose collaborative learning for blended - flipped classroom to solve the problems. LMS Moodle is selected to apply for this learning model with subject of Postharvest Engineering becomes the pilot project. The collaborative learning is designed and implemented for credit transfer earning between undergraduate programs of Agriculture Technology Departments in Udayana University (Unud) and Sam Ratulangi University (Unsrat). The two universities are located in different islands. Udayana University is in Bali island and Sam Ratulangi is in North Sulawesi.

2 Design and Implementation

According to Indonesia Qualification Framework (KKNI) and National Standards of Higher Education [18], learning outcome is the main part of the learning process for all learning methods. Hence our design is initially begun with discussion and agreement on learning outcomes between the two universities as seen in Figure 1. This is coherent which is stated in [12], [14], [19]. Thus the learning outcome (LO) of the postharvest engineering course is below.

- i. LO 1: Students acquire complete knowledge of the concepts of post-harvest handling techniques of fresh horticultural products.
- ii. LO 2: Students are able to develop post-harvest technology to prepare products according to the needs of different market levels.
- iii. LO 3: Students are able to apply post-harvest handlings of horticultural products to maintain quality and shelf life.
- iv. LO 4: Students are able to analyze and criticize practices of post-harvest handling of horticultural products to make changes to its improvement.
- v. LO 5: Students can work in a team to design projects related to the improvement of post-harvest handling of horticultural products.

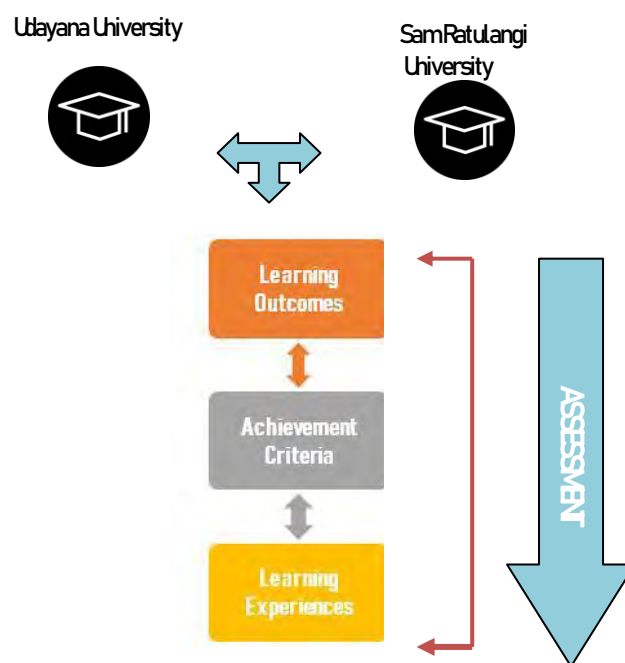


Fig. 1. Principle of Learning Process

Therefore the collaborative learning for Postharvest Engineering subject which involves two departments of agricultural technology of Udayana University and Sam Ratulangi University is designed below, as shown in Figure 2.

- Both Departments have discussed and got agreement on the Learning Outcomes and learning process which includes semester plan, syllabus, interaction strategy, assessment and evaluation.
- A Semester Lesson Plan is set and Table 1 shows an example of the plan for the first and second week.

The course implementation yields good performance of students and high positive reception from the students in Udayana University and Sam Ratulangi University. The students' grades, scores, and their feedbacks are almost the same. These can be achieved with a good agreement on the course learning outcomes, design, and learning plan between both departments from both universities. Thus both departments can claim that they achieved the same good quality standard of the course. Therefore credit transfer system between both departments can be highly recommended to develop for all courses. As a result, collaboration learning as an initial activity for establishing transfer credit system is successfully demonstrated.

4 Conclusions

Collaborative learning of the course of Post-harvest Engineering that was successfully implemented in department of agricultural technology in Udayana University and Sam Ratulangi University. The course was for undergraduate students which were joined by nine students of Udayana University and nineteen students of Sam Ratulangi University. The collaboration has been started by setting up all learning system, starting from learning outcomes, then its design and its semester learning plan. These need a good agreement from all facilitators or lecturers from both universities.

The learning implementation yields satisfactory results in term of students' performance, students' scores and grades. They give high appreciation for the course by giving positive evaluations and good comments. Surprisingly the grades, the scores, and the evaluation results are almost indistinguishable between both universities students. Therefore the same quality standard of learning has been achieved. Hence it makes credit transfer system highly possible to implement. Finally new learning experiences are felt by the students which are matched to the expected learning outcomes.

5 Acknowledgment

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6 References

- [1] Miriam Clifford, 20 Collaborative Learning Tips And Strategies For Teachers, available on <http://www.teachthought.com/pedagogy/20-collaborative-learning-tips-and-strategies/> , accessed on July 3, 2017.
- [2] Abdelaziz Bouroumi and Rkia Fajr, Collaborative and Cooperative E-learning in Higher Education in Morocco: A Case Study, International Journal of Emerging Technologies in

- Learning (iJET), Volume 9, Issue 1, 2014, pp 66 – 72.
<http://dx.doi.org/10.3991/ijet.v9i1.3065>
- [3] M.M. Alnabhan, Y. Aljaraideh, Collaborative M-Learning Adoption Model: A Case Study for Jordan, *International Journal of Emerging Technologies in Learning (iJET)*, Volume 9, Issue 8: "Learning in Networks", 2014, pp. 4 – 10. <http://dx.doi.org/10.3991/ijet.v9i8.3639>
- [4] Olga V. Sumtsova, Tatiana Yu.Aikina, Liudmila M. Bolsunovskaya, Collaborative Learning at Engineering Universities: Benefits and Challenges, *International Journal of Emerging Technologies in Learning (iJET)*, Vol. 13, No. 1, 2018, pages: 160 – 177. <https://doi.org/10.3991/ijet.v13i01.7811>
- [5] Fajar Purnama; Tsuyoshi Usagawa; Royyana M Ijtihadie; Linawati (2016). Rsync and Rdiff implementation on Moodle's backup and restore feature for course synchronization over the network 2016 IEEE Region 10 Symposium (TENSYMP), Year: 2016, Pages: 24 – 29.
- [6] Evangelia Triantafyllou, The flipped classroom: design considerations and Moodle. Proceedings of the ETALEE 2015 Conference, Exploring Teaching for Active Learning in Engineering Education DTU, Copenhagen, Denmark, November 11-12 2015, pages: 5 – 11.
- [7] Mark Paynter, Neville Bruce, Case Studies: Using Moodle for Collaborative Learning with University and Senior Secondary Students, 1st Moodle Research Conference, Heraklion, Crete-Greece September, 14 - 15, 2012, pages: 33 – 38.
- [8] Center for Digital Education, Issue Brief The Flipped Classroom Increasing Instructional Effectiveness in Higher Education with Blended Learning Technology for Higher education students. Available at www.echo360.com.
- [9] Linawati, Blended Learning Approach of the Flipped Model for Partograph Short Course. *Journal of Education and Learning*. 2016. Vol. 10 (3) pp. 255-264.
- [10] Bart Marty (2014). Blended and Flipped: Exploring New Models for Effective Teaching & Learning. A Magna Publication.
- [11] Rosa M. Carro; Victor Sanchez-Horreo (2017). The effect of personality and learning styles on individual and collaborative learning: Obtaining criteria for adaptation. 2017 IEEE Global Engineering Education Conference (EDUCON), Pages: 1585 – 1590.
- [12] John FitzGibbon, Learning Outcomes and Credit Transfer: Examples, Issues, and Possibilities, A BCCAT Special Report, 2014, bccat.ca/publications.
http://bccat.ca/pubs/Learning_Outcomes_and_Credit_Transfer_Feb2014.pdf
- [13] Antoni Shvindt and Ivan Nikanorov, Mechanisms for credit transfer of e-learning results within the framework of educational programs of higher education, MATEC Web of Conferences 141, 01055 (2017), DOI: 10.1051/mateconf/201714101055
- [14] Dietmar K. Kennepohl, Incorporating Learning Outcomes in Transfer Credit: The Way Forward for Campus Alberta?, *Canadian Journal of Higher Education Revue canadienne d'enseignement supérieur* Volume 46, No. 2, 2016, pages 148 – 164
- [15] Kemenristekdikti, Rekomendasi Rakernas – Kemenristekdikti, Semarang, 3 – 4 January, 2019.
- [16] Map of Indonesia available at <http://www.indonesia.cz/the-archipelago/> , accessed on 1st July 2019.
- [17] <https://forlap.ristekdikti.go.id/perguruantinggi/homegraphpt> , accessed on 1st of July 2019.
- [18] <https://banpt.or.id/instrumen/perpres/PerPres%20Nomor%208%20Tahun%202012.pdf> , accessed on 1st July 2019.
- [19] Australian Qualifications Framework Council, Credit Transfer: An Explanation, 2012, www.aqf.edu.au

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