The Design of Blended Learning Modules for Higher Education

by Adi Cahyono

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The Design of Blended Learning Modules for Higher Education

A N Cahyono*, **Zaenuri, M Subagja**

Universitas Negeri Semarang, Indonesia

*adinurcahyono@mail.unnes.ac.id

Abstract. Blending the traditional values of face-to-face teaching and the best practices of online learning becomes a way to face challenges in the fourth Industrial Revolution era. This study aimed to design blended learning modules for higher education. An explorative design research was conducted engaging lecturers in 69 study programs at Universitas Negeri Semarang. Data was collected through focussed group discussion, observation, a series of pilots and a debriefing session. The results concern standards for elements, regulations and quality assurance. Descriptions of the work processes and results are also explained in this paper. Designing blended learning modules must pay attention to the course material characteristics, learning management system features, supporting facilities, the lecturer roles in preparing and facilitating the courses, students' activities and their perception. This paper offers an alternative of design of online modules for blended learning in higher education.

1. Introduction

The Industrial Revolution 4.0 has encouraged the emergence of Education 4.0 and strengthened the need for learning innovations in higher education by utilizing technology [1]. Nowadays, the development of technology is able to realize "learning anywhere and anytime". Today's students as a post-millennial generation are also very familiar with technology. These existing potential and systems need to be managed as an effort and strategy to improve the quality of learning in universities by utilizing technology and encouraging students to have 21st century competencies. By utilizing latest technology, the world of education develops an online-based learning strategy or better known as online learning. The best practices of online learning can be blended with the traditional values of face-to-face teaching, known as blended learning [2].

There are various models that can be used in the implementation of blended learning [3]. Numerous facilities contained in electronic devices also provide opportunities for students to share experiences, discuss, and help each other, work together to share text, sound, image, animation, video and combination files [4]. Other online social activities can also build students' experiences and social attitudes [5]. Nowadays, a surprising amount of digital resources for learning is available online. This leads researchers and educators to re-design learning resources in order to orchestrate their students learning [6].

Based on the description above, it is considered very necessary to explore standards for elements of online modules supported by regulations and quality assurance for the implementation of blended learning in higher education. In this paper, we describe the design of online modules units for blended learning in higher education. The results of the implementation and evaluation of blended learning by using these learning units will be available in the end of this year.

2. Theoretical Framework

From the learning theory perspective, scientific insights have change from the behaviourism that suitable for computer assisted mastery learning to the today's accepted social constructivism which can be supported by a more open learning environment [7]. Learning theories generally lead to the same issue, i.e., how to arrange the educational resources into an educational design that optimizes learning? This educational design arrangement also includes online learning arrangements which have become popular in the current era.

Online learning is a learning activity that utilizes networks (Internet, LAN, WAN) as a method of delivery, interaction, and facilitation and is supported by various other forms of learning services [5]. There are at least three important things that become requirements in e-learning, namely: network utilization, learning service support, and tutor service support. Some universities in several countries provide several alternative models of learning activities/lectures to their students. The goal is that students can flexibly manage their lecture activities in accordance with the time and other activities of students. There are three alternative models of learning activities that students can choose, namely: fully face-to-face (conventional), partly face-to-face and partly through the internet (blended learning), or fully online.

Blended learning combines the best features of traditional schools with the advantages offered by online learning to provide personalized and different instruction across groups of learners [8]. Students in hybrid learning programs can learn online and still have the opportunity to face-to-face learning to maximize their learning according to their own needs. A research about schools and hybrid learning programs [9] produce findings that most hybrid programs can be classified into four models, namely: Rotation, Flex, A La Carte, and / or Enriched Virtual. Rotation Model means that for each subject, students rotate either on a fixed schedule or at the teacher's discretion among the learning modalities with one of them being online learning. Flex Model means that for each subject, online learning becomes important in the learning process and directs students to offline activities. A La Carte Model means that subjects attended by students are fully done online to provide other experiences to students in face-to-face learning. Enriched Virtual Model means that students are required to conduct face-to-face learning sessions with teachers and then be free to complete their remaining subject matter online.

When designing this instruction with this strategy with this strategy, there are several media to be addressed [7]. The main issues are how to arrange blended learning activities and how to design online modules unit for blended learning in higher education. In this paper, we address this issue for the case of the design of online modules for blended learning in higher education. In this way, the research question of this research was: *How to design blended learning modules for higher education?*

3. Method

To address the research question with regard to exploring the design of online modules for blended learning in higher education, this study used an explorative research approach. This study was conducted at a higher education institution, namely Universitas Negeri Semarang (Indonesia) engaging lecturers in 69 study programs. Data was collected through focused group discussion, observation, a series of pilots and a debriefing session was conducted afterward. Analyses began with the organization, annotation, and description of the data. In this research, a learning system was developed and standard for elements was set.

This research began with a preliminary phase to define the specification procedure and to develop technical requirements as a foundation and guideline for designing the online modules. Based on a theoretical framework, in the next phase, the online modules were designed, and the learning activities were arranged. The lecture modules, both for online and offline learning activities, were created by lecturer. They were then validated and evaluated by experts. To support the implementation, regulations and quality assurance were also issued.

4. Result

This research is part of a big project to develop blended learning in Universitas Negeri Semarang conducted in 2018-2019. In this project, the online modules were designed. Then the use of the blended modules will be field-tested in didactics courses by lecturers in all study programs. The monitoring process of the field tests is currently ongoing during 2019.Therefore, we now focus on the design process, which we will describe subsequently for some units.

Online learning at Semarang State University is managed by the Academic Affairs of UNNES, carried out by utilizing a system that has been developed and managed by UPT-TIK UNNES, a technical implementation unit for information and communication technology, and assured its quality by BPM UNNES, a quality assurance agency. The system, called eLENA, can be accessed through http://elena.unnes.ac.id. This system is integrated with academic information systems, called SIKADU where the student registration process, lecture scheduling, judiciary, and other academic activities are carried out. This system is also automatically connected with the lecture management information system, called MULANG, where lecture meetings, lecture journals and the presence of students and lecturers are recorded and monitored.

By paying attention to existing regulations, observation findings, and discussion results, it was decided that in one semester, lectures for one course must be held in 16 meetings and a maximum of four times out of the 16 sessions can be held online through the Elena system. Mid-term and final examination must be conducted face to face. The number of meetings conducted online in each study program or course in particular is different. This difference is caused by the determination of lectures conducted face to face or online based on the characteristics of the material and activities that must be carried out in the course.

The findings show that for exact courses or study programs, online lectures are conducted in approximately2 to 3 meetings, while for courses in social humanities study programs, online lectures are held evenly between 1 and 4 times. However, this difference is also determined based on the type of lecture, for theoretical lectures, 3 to 4 meetings conducted online, and for practical lectures, online lectures are only conducted in approximately 1 meeting, even 4.3% of respondents report that meetings in their courses cannot carried out online, because they have to do practice on site and discussion between students and lecturer directly and apply blended learning with the flipped-classroom strategy. In general, flipped-classroom strategies are used in 5 to 14 meetings in each course, although there are some courses that do not apply this strategy.

The number of lectures conducted online and face-to-face is designed before lectures begin and written in the Semester Learning Plan. This plan is designed by lecturer or teaching lecturers' team and uploaded to SIKADU, so students can access it before the lecture begins. The following are examples of Forms, Learning Methods, Learning Experiences contained in the Semester Learning Plan for Spatial Geometry course.

- 1st *meeting - Face-to-face*: Lecture, Project based learning: based on target and planning, students 'draw objects in the three-dimensional space' used in the discussion of spatial geometry both manually and using dynamic geometry software, and Discussion.
- 5th *meeting - Flipped Classroom:* through structured and independent assignments, students learn concepts and answer questions about 'angles between 2 crossing lines and perpendicular lines' from sources available in the eLENA (http://elena.unnes.ac.id) before face-to-face lecture held, Lecture, Cooperative learning, Problem based learning, and Small Group Discussion.
- 7th *meeting – Online:* Through eLENA (http://elena.unnes.ac.id), students learn the material presented in the form of videos of lecturers' explanations about 'distance', discuss topics online provided by lecturers, do formative tests online, and do assignments and upload them through the Elena system, Project based learning.
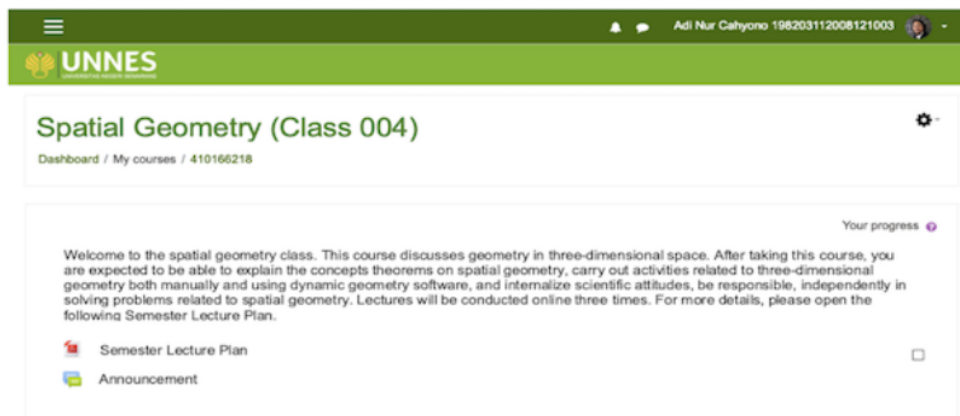
Figure 1. Introductory section of the online module.

Determining the number of face-to-face and online meetings will make it easier to arrange the module structure for a lecture unit. Modules for face-to-face lectures are arranged as usual but are combined and adapted to the conditions and requirements for the implementation of blended learning. The online module is compiled and prepared in eLENA. The components of the online module are determined based on the study of literature and needs in each study program or course. At least, as part of the teaching and learning process, preliminary and general information about the course, learning outcomes and lecture plans are important parts to be delivered at the beginning of an online class. Figure 1 shows an example for the introduction of an online module.

The next component, after the introduction, is lecture material. All respondents agree that material is the main thing in a lecture, including online lectures. But differences arise when discussing about the types of learning objects that are appropriate for delivering material.71% of respondents use videos to deliver material, 10% use presentation slides, 42% use narrated presentation slides, 36% use ebook and 42% use other types, such as material available on the internet, etc. *(Note: respondents choose more than one type).* Figure 2 shows an example of the material presented in the form of a video.

Figure 2. Lecture material for online module.

Then, 78% of respondents reported that enrichment material is important to be offered to online classes. Enrichment is provided by delivering the URL of content on the Internet, such as: scientific papers in journals, e-books, online news, videos, etc. An example of enrichment content is shown in Figure 3.

To add your insight into the topic of distance, please read a paper that can be accessed via the following link!

Papers in the Scientific Journal related to the topic of distance (Cahyono, 2018)

Figure 3. Enrichment content.

As one of the characteristics of online lectures, discussion forum is an important component that must exist to facilitate two-way communication. In this forum, student and other students as well as lecturer interact online to discuss specific topic in a session. 94% of respondents agree with this online module content. An example of discussion forum component is shown in Figure 4.

After you study the material above, now let's discuss the topic in the following discussion forum.

Discussion 7

Figure 4. Discussion Forum.

The last two components are test and assignment. 83% of respondents reported that they needed a test component in their online class, while 88% needed an assignment component. In this regard, 71% of respondents stated that test and assignment were mutually independent components, while other respondents stated that tests and assignments could replace each other. It means that one could be given, not both simultaneously in an online class). Figure 5 shows an example of these components.

To find out your level of mastery about the material at this meeting, please do the following test!

Formative Test 7.

Finally, please complete and submit the following assignment!

Assignment 7.

Thank you for your attention and activeness in this session. Success for all of us, and see you at the next session.

Figure 5. Test and assignment.

If one session at eLENA contains the above components, namely material, discussion forum, formative test, and assignment, then the information is automatically recorded in MULANG as a lecture meeting held by the lecturer. In addition to preparing the content, lecturer also have to do online facilitation, namely by actively in discussion forums, assessing students' responses, test and assignment results. Students will be recorded in MULANG that they are present in the lecture at the session if they have completed several activities, namely: learn materials, active in discussion forums by giving responses or answers, completing formative tests, and doing assignments. For the flipped-classroom strategy, the components uploaded to the system are given according to needs. Figure 6 shows an example of the content in the session that applies this strategy.
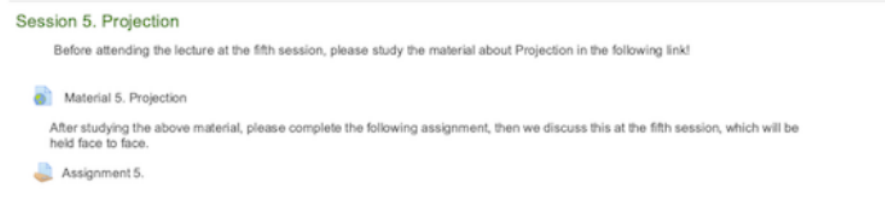
Session 5. Projection

Before attending the lecture at the fifth session, please study the material about Projection in the following link!

Material 5. Projection

After studying the above material, please complete the following assignment, then we discuss this at the fifth session, which will be held face to face.

Assignment 5.

Figure 6. Components for the Flipped-Classroom strategy.

The results of the design process are available online (http://elena.unnes.ac.id). Input from other lecturers is expected to further development and extension the unit. The Quality Assurance Agency is responsible for controlling and evaluating its content, processes and evaluations. The Chancellor's Regulation was issued to regulate the implementation of blended learning. Quality procedures are also arranged so that the implementation runs in accordance with established standards and expected goals. In addition, guidance for lecturers and for students is very important to be published. The system must be maintained and developed both for features and appearance.

5. Conclusion

The result leads to the conclusion that digital blended learning units should be designed by lecturers in mind. Designing online modules must pay attention to the study program and course material characteristics, type of lecture (theoretical or practical lectures, learning management system features, supporting facilities, the lecturer roles in preparing and facilitating the courses, students' activities and their perception. There are two types of strategies commonly used for lectures in higher education, namely: full online learning which is equivalent to a face-to-face teaching and learning for several meetings (up to 4 meetings) and flipped classroom strategies where meetings are held face to face, but some content and activities are carried out online through the system. Standards for elements must be identified and specified. For a full online lecture, the lecturer must prepare an online module containing at least material and enrichment, discussion forum, formative test, and assignment. The lecturer also conducts online facilitation and students learn material, active in discussion, complete test, and collect assignments. Regulations and quality assurance. The implementation of blended learning in Higher Education is supported by the issuance of regulations and quality assurance. This paper offers an alternative of design of online modules for blended learning in higher education. The use of this design is regularly evaluated through further research.

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FINAL GRADE

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GENERAL COMMENTS

Instructor