

# DEVELOPMENT OF BLENDED LEARNING MODEL BASED JIGSAW TO ENCHANCE SCIENCE MOTIVATION COLLEGE STUDENTS

Sheren Dwi Oktaria<sup>1</sup>, Badeni<sup>2</sup>, Alexon<sup>3</sup>

<sup>1</sup>Lampung University, <sup>2</sup>Bengkulu University, <sup>3</sup>Lampung University

[sheren.dwi@fkip.unila.ac.id](mailto:sheren.dwi@fkip.unila.ac.id)

## Abstract

The purpose of this research is to produce a quality jigsaw-based Blended learning model to increase science motivation. This development research adopts the development step with the ADDIE model which consists of the Analysis, Design, Develop, Implement and Evaluate stages. Data collection was obtained through internal validation and external validation. This development research produces a product in the form of a blended learning model based on the components and devices of the learning model. Student science motivation gave a good response and had an impact on increasing learning motivation such as intrinsic motivation, self-efficacy, self-determination, grade motivation, and career motivation with an average of 3.36 in the very good category.

**Keywords:** *Blended learning, Jigsaw, Science Motivation*

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## 1. Introduction

Education is the most important part in the process of developing a nation and also plays a role in the formation of quality human persons who are able to compete in the disruptive era. Therefore, the Indonesian government is very serious in dealing with the education sector. With a good education system, it is hoped that it can produce quality human resources and be able to adapt and compete in the era of globalization. The rapid development of technology in the era of increasingly sophisticated disruption has an impact on the world of education in Indonesia. Therefore, the education system in Indonesia is slowly starting to innovate by adjusting the development of ICT and still maintaining the main essence of education in order to achieve the right learning goals in the era of disruption.

Adopting and integrating ICT-based instructional strategies has its challenges, but if you have a good understanding you can achieve successful online learning in college. The role of the lecturer has a large part because the lecturer is required to multi-task in conveying knowledge, training, encouraging, stimulating (Purnawinadi, 2021). E-learning is currently a necessity in higher education which continues to develop and then becomes something that is commonly used in learning. Online learning offers the opportunity to reach a large number of students, regardless of time and space. However, Blended learning is still controlled by the lecturer based on a predetermined learning design design from a distance (Patrick & Sturgis, 2015). According to (Prohorets & Plekhanova, 2015) this research, the combination of asynchronous and synchronous can increase students' motivation and interest in learning and also have an impact on increasing learning success.

The application of Blended learning is one type of learning that adheres to health protocols and is useful in increasing students' knowledge and skills (Mulyadi et al., 2021). By developing the Blended learning model, it is hoped that it can provide innovation in the learning model to increase science motivation in higher education. Science motivation in education is very difficult to measure, therefore it is hoped that this learning model can be a transformation of learning model innovations with ICT in education. Of course, changing instructional approaches is not an easy task, especially when technology is involved in the education system.

The success of a learning depends on the creativity and quality of a lecturer in motivating students during the learning process by adjusting the needs and interests of students in the learning process. In relation to learning problems, learning technology has an important role in solving learning problems experienced by students. With the development of learning technology, it can be used as a way to overcome learning problems faced by students today (Oktaria et al., 2018)(Oktaria & Budiningsih, 2018). Because it provides opportunities for active learning and creative training. The use of technology to promote student-centered teaching strategies that facilitate student self-learning, collaboration and active learning is strongly encouraged. Therefore, it is necessary to design a system that can accommodate the specific needs of students so that relationships between

students are maintained so that an effective learning process can be achieved between online learning and traditional learning.

Blended learning is a new innovative concept that maintains the advantages of traditional classroom teaching and online learning with ICT. Blended learning has the scope of collaborative learning between constructive learning and online learning with ICT (Lalima & Lata Dangwal, 2017),(Oktaria et al., 2018). This model can combine various strategies, approaches, and methods that will attempt to achieve learning goals in the era of disruption (Trisnowati & Firmadani, 2020). Blended learning balances conventional and online learning. The humanistic element in conventional learning is still used because students also need direct interaction with the teacher, as a form of psychological support and some things that need to be explained directly, especially in affective and psychomotor abilities. The development of the Blended learning model that will be carried out in this study will integrate with the addition of the Jigsaw Technique. Adding Jigsaw to research (Karacop, 2017) can see the contribution and cooperation between groups in completing a task or project by integrating e-learning can encourage efficient and effective cross-group collaboration during learning (Chang & Benson, 2020). Online learning and traditional learning methods used in conjunction with each other create a superior learning style (McDonald et al., 2018). Based on the reasons above, it can be seen that this development resulted in a jigsaw-based Blended learning model that can increase collage students' science motivation.

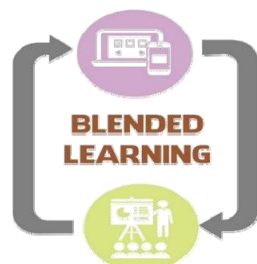
## 2. Method

The research objectives of this study were to develop Blended Learning model Based Jigsaw to enhance motivasi sains. Accordingly, the research methods used in this *Research and Developmen* with ADDIE model yang meliputi *analysis, design, develop, implement* dan *evaluate* (Shelton & Saltsman, 2006), (Roblyer, 2015).

## 3. Results

The result of the research consists of the result of the analysis, design, development, implementation and evaluate. Analysis is the initial stage carried out to analyze the importance of developing new learning models. The analysis process carried out includes three things, namely, analysis of learning problems, needs analysis, analysis of student characteristics. At the design stage, the researcher will take steps to describe the prototype model and design the instruments to be used in the research, design the blended learning model that will be developed and design e-learning guides for students and lecturers.

Furthermore, at the Development stage, the researcher begins by developing and compiling the components of the blended learning model, e-learning guide for lecturers and students that will be used in the learning process. This stage will begin with the development of the main components of the Blended Learning model, namely: syntax, social system, principle of reaction, support system, instructional effect. Then develop the e-learning guide for lecturers and students by compiling a systematic e-learning guide for lecturers and students. In the e-learning system, the lecturer acts as a course creator and the student acts as a student (user). At this stage of development, internal validation was carried out by media, model and material experts. Validation is



carried out to assess the developed product and provide suggestions and comments on the developed model which will later be used as the basis for researchers to make improvements to the developed product.

Figure 1. Blended Learning model

The implementation stage is limited to students in Bengkulu province for product try-outs. Evaluation was carried out in this study by providing formative evaluation and summative evaluation. The results of this evaluation will be used as feedback for the model developer. Product improvements will be made based on the evaluation results that need to be improved. Then learning is carried out for 3 weeks with a model that has been

developed. After that, a questionnaire was given to determine the students' science motivation after the learning trial.

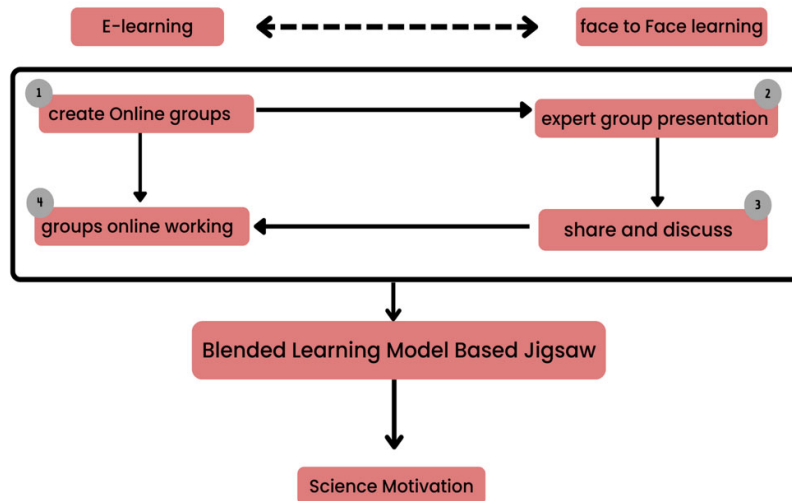


Figure 2. Conceptual framework of the Blended Learning Model based Jigsaw to enhance Science Motivation for college students

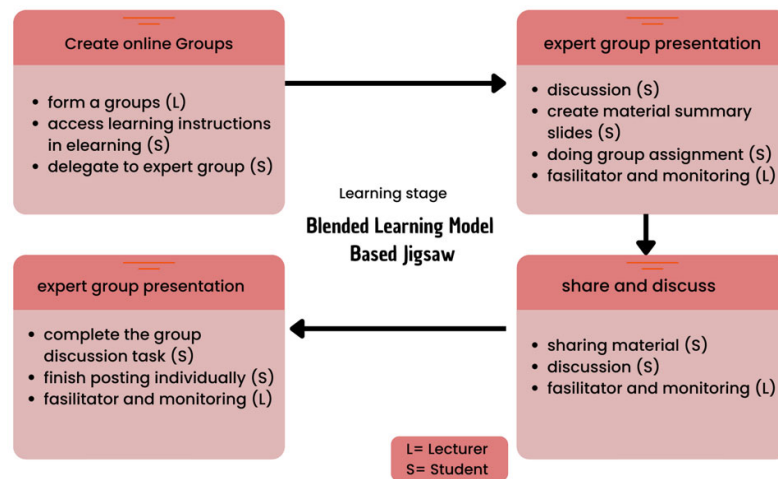


Figure 3. Blended Learning Model based Jigsaw to enhance Science Motivation for college students

Learning with the jigsaw-based blended learning model (BLBJ) provides facilities for groups to complete tasks together. Discussion activities can also be carried out online and offline. Lecturers can maximize learning time and ensure students can take responsibility for thinking and demonstrate understanding of concepts. At the same time, certain competencies are even more important to success in BLBJ because of the complexity involved with providing instructions that involve interaction between groups of experts for discussion and working.

Blended learning is an effective method of teaching science, and reflects positively on student performance in certain subjects. This method is considered important because of the use of both, e-learning and traditional methods and as a result, students' achievement in science and their skills is improved. The use of mixed learning strategies plays a major role in transforming the educational environment into a creative and interactive one; involve students and teachers in the educational process (Almasaeid, 2014).



Figure 4. Simulation of activities on the jigsaw-based Blended Learning model

Students conceptualize their motivation to learn science in 5 dimensions, that is intrinsic motivation, self-efficacy, self-determination, career motivation, and grade motivation (Verma, 2019), (Glynn et al., 2011), (Glynn et al., 2009), the findings are viewed in terms of socio-cognitive learning theory, and directions for future research. This study conducted product trials to see the scientific motivation of students after BLBJ was applied.

Table 1. The average science motivation of students in the trial of the jigsaw-based Blended Learning model

Factor	Average	Details
Intrinsic Motivation	3.17	Good
Self-Efficacy	3.37	Excellent
Self-Determination	3.36	Excellent
Grade Motivation	3.51	Excellent
Career Motivation	3.51	Excellent
<b>Average</b>	<b>3.38</b>	<b>Excellent</b>

In intrinsic motivation, students realize that learning science is for their own sake because it is interesting, fun and very relevant for the future. Similar to Self-efficacy, students are confident in their ability to achieve learning goals. Observe peers and work together in groups during online learning and Face-to-face learning. Self-determination highlights the importance of self-development and behavioral regulation. The motivation to learn in the field of science refers to the control that students believe that they have completely mastered science learning. Career motivation is motivation that arises from students' perceptions of students' future careers by developing the skills needed for future careers. Grade motivation is motivation that includes other components such as student preferences and passion and also involves grades with levels.

They still need to be able to maximize instructional time, teach rigorous content, ensure students are responsible for thinking in the classroom, and provide plenty of opportunities to demonstrate understanding. Motivation is considered a very significant factor for learning success. I investigate student success in learning English as a second language. The key factors that determine student success or failure are student enthusiasm, commitment, and persistence (Radosavlevikj, 2015). At the same time, certain competencies are even more important for success in mixed classes because of the complexity involved with providing highly personalized instruction.

We know that the BLBJ model follows a hybrid pattern that combines face-to-face learning activities in traditional classes. BLBJ offers continuous improvement to the factory-based class system, but doesn't interfere with it. The more disruptive models, however, are positioned to transform class models and become engines of change in the long run, especially at the mid-level. Various mixed learning hybrids will most likely fail as pure distraction gets good enough (Christensen et al., 2013), (Oktaria & Hadiwinarto, 2020). Each group in BLBJ Learning has the responsibility to master a material because each group will be tasked with being an expert group to present material and discuss. In addition, the online working group will also play a role in completing assignments and understanding the material presented by the expert group during the BLBJ. Interactive learning activities between online learning and face to face learning can empower students to manage their own learning and support collaboration between students. In line with research from (Meikleham et al., 2018) states that if the Blended learning model is applied to the teaching and learning process it becomes effective with the transition of students to a higher level in acquiring knowledge and developing skills.

#### 4. Conclusion

The jigsaw-based blended learning model to increase science motivation in students' collages consists of principles, learning processes. The learning process of the BLBJ model consists of stages of online learning and face-to-face learning which, if translated into online groups, expert group presentations, sharing and discussion, and expert group presentations. The findings from the research and development of the BLBJ model can be a strong support for developing students' science motivation. They still need to be able to maximize instructional time, teach rigorous content, ensure students are responsible for thinking in class, and provide plenty of opportunities to demonstrate understanding. Motivation is considered a very significant factor for learning success. This study conducted product trials to see students' scientific motivation after BLBJ was applied.

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