THE NEEDS ANALYSIS OF BLENDED LEARNING IPA TERPADU

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ABSTRACT
The impact of technological advances in education has offered forms of ICT-based learning approaches that require teachers to continue to innovate to improve the quality of education. Learning innovations should continue to be carried out by teachers as educators to answer the need to overcome learning problems. This study aims to analyze the factors needed for blended learning and provide recommendations regarding the factors in the design and development of Integrated Science blended learning. Characteristics of students and teacher experience become input in designing blended learning. Recommended factors for integrating Integrated Science blended learning to include technological infrastructure, pedagogical models, and learning strategies.

Keywords: Needs Analysis, Blended Learning, IPA Terpadu

INTRODUCTION
Along with the development of increasingly sophisticated and fast information technology, it has provided benefits for people's lives in carrying out their activities. The impact of technological advances in education has offered forms of ICT-based learning approaches that require teachers to continue to innovate to improve the quality of education.

Integrated Science is compulsory at the formal education level of SMP/MTs. The characteristics of integrated science subjects study natural science phenomena by combining material from physics, biology, and chemistry. The achievements of Integrated Science learning include cognitive, affective, and psychomotor aspects. Integrated Science subjects in junior high schools are developed as integrative science subjects, applicatively oriented, developing thinking skills, learning abilities, curiosity, and a caring attitude and responsibility towards the natural environment. Science is a dynamic process of seeking knowledge through seeking, investigating, and verifying natural behavior in the surrounding environment (Nworgu & Optum, 2013).

Learning innovations should continue to be carried out by teachers as educators in order to answer the need to overcome learning problems. Since the COVID-19 pandemic hit, schools and teachers have made learning reforms initially oriented to face-to-face and distance learning. Blended learning is an alternative learning model considered appropriate for facilitating student learning activities during the COVID-19 period.

Blended learning combines face-to-face and online learning using internet technology (Makhdoom et al., 2013; Alzahrani, 2017). Blended learning is considered a new learning model even though it has been around for a long time and is widely applied in several developed countries. Many studies on the effectiveness of blended learning have made positive contributions to learning, including increased learning motivation (Islam et al., 2018; Gusti Ayu Dewi Paramita et al., 2021; Permata & Nanda, 2021), as well as increased learning outcomes and

For the implementation of blended learning to run effectively and efficiently, comprehensive preparation of the components of the blended learning system is required. One component that must be prepared is the IT infrastructure (Thorne, 2003; Brown, 2016). In particular, online learning needs to pay attention to pedagogic models, learning strategies, and learning technology (Nada & Ritland, 2005). The student learning experience is also a determinant of the success of blended learning (Sher, 2009).

This study aims to analyze the factors needed for blended learning and provide recommendations regarding the factors in the design and development of blended learning. Most previous studies have revealed the success of blended learning in achieving the quality of education, but only some studies still need to analyze the needs of blended learning.

RESEARCH METHOD

This study uses a qualitative and quantitative descriptive approach. The research subjects involved 276 students and 10 teachers—data collection techniques by conducting interviews, observations, and surveys. The research instrument used interview sheets, observation sheets, and questionnaires. Qualitative data collected from various sources and methods will then be analyzed using triangulation techniques.

RESULTS AND DISCUSSION

The results of the study contain an explanation of the factors needed as well as recommendations in the application of blended learning following the research objectives:

Preliminary Study

At this stage, a survey was conducted using a questionnaire to 276 students. The survey aims to determine the characteristics of students so that the information collected can be used as input in designing blended learning. The survey results show that 95.3% of students are interested in blended learning. The results of interviews with 50 respondents stated that blended learning was chosen because they wanted to try a new learning experience. Furthermore, the availability of devices to connect to the internet, as much as 95% of students already have smartphones. This resource can be utilized in blended learning, which requires a device to access the material and connect to the internet. The online learning experience was obtained by as many as 89% of students said they had. Based on the results of interviews, 90% of respondents online learning activities by searching for subject matter on the internet.

Surveys and interviews with teachers were conducted to know the experience of designing blended learning and online learning, responses to blended learning, teacher skills, theories or perspectives on learning, and the available resources. The results obtained show that all respondents have never designed blended learning. The following 10 respondents (teachers) have done online learning using applications or media such as the internet, zoom, and wa groups. The teacher's interest in blended learning shows that 10 respondents stated that it is necessary to apply it. Based on the interview results, the reason for the need for blended learning is because of the demands during the COVID-19 pandemic to change the learning paradigm in order to
improve the quality of learning, online learning is felt to have many weaknesses, so face-to-face meetings are needed, and want to try a new learning approach, namely blended learning. As for resources related to devices that can be used, 10 respondents already have laptops and smartphones that can connect to the internet. The teacher's perspective on learning is generally teacher-centered, only providing subject matter and assessing learning outcomes.

Information about the characteristics of students is essential for teachers to know as input in designing learning (Budiningsih, 2015; Nakayama et al., 2007). The availability of ICT devices and students' skills are a source of support and concern for implementing blended learning. Blended learning combines face-to-face and online learning because of the delivery of materials and access to information materials using ICT tools. Jones argued that information and communication technology (ICT) devices are necessary for blended learning (Jones, 2007). The availability of information and communication technology can also facilitate students without being limited by time and place so that students can study anytime and anywhere (Singh & Kart, 2016). The skills mark students' readiness in blended learning in using ICT devices and students' experience of accessing the internet that students already have. One of the considerations for implementing blended learning includes student readiness regarding IT skills and student experience (Firdaus, Muntaqo, and Trisnowati, 2020; Hofmann, 2014).

**Blended Learning Design**

Blended learning design is no different from the face-to-face learning design, starting with the curriculum analysis stage and subject characteristics. Integrated IPA combines scientific disciplines in physics, biology, and chemistry that apply to cognitive, affective, and psychomotor learning objectives. Analysis of material content is carried out in the following stages:

![Figure 1. Stages of Content Analysis](image)

The fundamental difference between blended and face-to-face learning is blended learning, which emphasizes learning management and information technology (IT infrastructure). Learning management includes material distribution, learning communication and interaction, assessment system, teacher's perspective on learning, learning environment, social interaction, and administrative support. Furthermore, IT infrastructure must be able to use technology, it must be easy to use, user interface design, and the use of technology must be able to build social interaction (Masoumi & Lindström, 2012).
Dabbach stated that 3 components must be considered in designing online learning, including pedagogical models, learning strategies, and learning technology. Component This can be combined with face-to-face learning in a blended learning environment.

Figure 2. E-quality framework (adapted from Masoumi & Lindström, 2012)

There are similarities between the components proposed (Masoumi & Lindström, 2012) and (Nada & Ritland, 2005), including technological factors, pedagogic models, and learning strategies. Blended learning that needs to consider technological infrastructure factors is seen as equipment and applications that need to be designed and prepared systematically in a learning management system (LMS), learning content, synchronous, asynchronous so that it makes it easier for users to communicate between teachers and students. Technological infrastructure factors and pedagogic models can affect student learning outcomes (Susanto, Rachmadullah, and Rachbini 2020).

The pedagogic model provides the teacher's view of learning and becomes the basis for determining approaches and strategies in implementing learning, such as collaborative, student-centered learning, social interaction, and exploratory. In the blended learning environment, there are learning strategies that the teacher must carry out, and of course, they will use technological equipment. Pedagogical models and the integration of information technology can influence the

Figure 3. Adapted E-Learning Components (Nada & Ritland, 2005)
success of learning and produce educational transformation processes and holistic perspectives (Sosa & Manzuoli, 2019).

CONCLUSION

Based on the results of the analysis, the needs for blended learning design include student interest in blended learning, learning experiences, student skills in using technology, resources for blended learning, curriculum and material analysis, analysis of characteristics of Integrated Science subjects, and teacher experience in designing online learning. And face-to-face learning. Furthermore, the recommended factors for blended learning design include technological infrastructure factors, pedagogical models, and learning strategies.

REFERENCES


