Application of Blended Learning Supporting Digital Education 4.0

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Abstract. The learning process undertaken by each school is face-to-face between educators and students; of course, this method will lose its appeal to meet digital education 4.0. So that education personnel and students should be able to adjust the Indonesia Economic technology and information that constitute a significant role as a medium for help, search, analyze, and obtain information about learning. The learning process to welcome digital education 4.0 cannot be separated from various computer devices, the internet, which can be done online (e-learning). To get good learning outcomes, of course, technological development (e-learning) must be able to benefit right, without having to leave face-to-face learning (face-to-face). For this reason, there are teaching models/strategies, teaching delivery, and the right quality of teaching, one of which is the Blended Learning Model. Blended learning is a learning model that combines the advantages of face-to-face learning models with e-learning learning models. With blended learning interaction and communication between educators and students can take place because this model is one of the active learning methods to deal with digital education 4.0.

1. Introduction

The development of science and technology is now a technological modification that has not only penetrated the industrial world but has also penetrated the world of education. The education world has begun to abandon learning offline, leading to online learning. Development of science and technology encouraging the educational system to make use of it. In this case improving the quality of education is an absolute (Parlaungan, 2018: 34).

Another Online is learning related to the internet using computer devices, gadgets. E-learning learning has become one of the exciting and hot innovations discussed as a digital media for education, because E-learning is a learning system using new methods by utilizing internet technology that can be accessed anytime and anywhere so learning is not only done in the classroom and only during class hours, but can also be done outside of class hours when needed. According to Clark, there are five functions of using the internet as a learning resource, namely: Media as technology, Media as tutor or teacher, media as socializing agents, Media as a motivator for learning, and e). Media as problem-solving ”(Plomp and Ely, 1996: 69).

Learning strategies are considered valid at this time in learning is face to face method is still the best way for learning activities. Online learning has the best advantages and has a vast wealth of learning resources. However, online learning is considered less interactive because people cannot last long
learning in front of a computer without interaction. Because students still need feedback from educators, and so do educators also need feedback, there is direct interactivity between students and instructors. However, learning is a two-way process that requires feedback between the instructor and his students; in this way, we will get active and targeted learning outcomes.

To answer all the needs of technological development for education, that is by applying the Blended learning model. Blended model of learning is a combination of learning excellence that is done face to face and virtual, which combines different methods of delivery, models of teaching and learning styles, to introduce different types of media choice between the facilitator and the teacher who gets late.

In terms of the terminology blended learning consists of two different words namely blended and learning, blended means mixture, together to improve quality so that it gets better (Collins Dictionary) or the formula of a combination of harmony or combination (Oxford English Dictionary) (Heinze and Procter, 2006: 236). While Learning is learning. Elena (2006) said that what was mixed were two main elements, namely Classroom Lessons and online learning. The more popular term is Blended e-learning compared to blended learning is the latest educational issue in the development of digital education 4.0. Zhao (2008: 162) explains, "the issue of Blended e-learning is challenging to define because it is a new method in the world of education. According to Ahmed, et al. (2008: 1) mentions: Blended Blended e-learning, on the other hand, merges aspects of blended e-learning such as web-based instruction, streaming video, audio, synchronous and communication, etc.: with traditional, face-to-face "learning.

Blended learning is a learning method that combines face-to-face meetings with online material in harmony. The combination of conventional learning where educators and students meet directly with online learning that can be accessed anytime and anywhere. Another form of blended learning is a virtual meeting between educators and students. Where between educators and students may be in two different places, but can give feedback, ask questions, or answer each other. Everything is done in real-time.

2. Benefits of Blended Learning

The benefits of blended learning in education are to provide flexibility in choosing the time and place to access lessons. So that students do not need to travel to where the lesson is delivered so that it can be done from anywhere whether they have internet access or not.

The advantage of using blended learning methods is as a combination of direct teaching (face-to-face and online teaching), but more than that as an element of social interaction, namely:

- There is an interaction between teachers and students
- Teaching can be online or face to face
- Blended learning combining instructional modalities (or delivery media)
- Blended Learning Combining instructional methods.

3. The concept of blended learning

Blended learning can combine several learning methods and is called hybrid learning. According to Benthall (2008), there are three concepts in blende learning, namely (1) pedagogies, (2) Technology, (3) theories of learning. Pedagogies is a paradigm shift from learning that used to be more centered on learning (student-centered learning paradigms). Technology, in this case, is a medium that uses the internet, such as websites, blogs, chat, teleconference forums, audio, and video in the blended learning method. While theories of learning that bring up the latest models for teaching and learning so that there is a significant change in the transformation of education or paradigm changes.

4. Blended e-Learning Characteristics

According to Sharpen et. Al (2006: 18) the characteristics of blended e-learning are:

- The provision of supplementary resources for learning programs that relate to traditional lines is significant, through institutional support for virtual learning environments
- Transformative level of learning practices supported by deep learning design.
- A holistic view of technology to support learning.
Blended e-learning contains face-to-face, which overlaps with computer-based blended e-learning that contains online learning.

The characteristics of constructivist learning theory (individual learning) for blended e-learning (Hasibuan, 2006: 4) are as follows.

- Active Learners
- Learners construct their knowledge
- Subjective dynamic and expanding
- Processing and understanding of information
- Leaner has his learning first paragraph after a heading is not indented (Body text style).

5. Application of Blended e-learning

The application of blended e-learning is now widely used by organizers of open education and distance education. If previously open education was permitted to implement distance education, with the issuance of the Decree of the Minister of National Education No.107 / U / 2001 (July 2, 2001) concerning the implementation of distance education programs, then individual high schools with the capacity to provide education open and long-distance using blended e-learning, has also been permitted to hold it.

Specifically, in blended e-learning, teacher education has the following meanings.

- Blended e-learning is the delivery of information, communication, education, training on teacher material both in the substance of the subject matter and in online education.
- Blended e-learning provides a set of tools that can enrich the value of learning conventionally (conventional learning models, studies of textbooks, CD-ROMs, and computer-based training) so that they can answer the challenges of the development of globalization.
- Blended e-learning does not mean replacing conventional learning models in the classroom, but it reinforces the learning model through the enrichment of content and development of educational technology.
- Teacher capacity varies greatly depending on the form of content and delivery. The better the harmony between content and delivery tools and learning styles, the better the capacity of students will, in turn, give better results.
- Utilising electronic technology services where teachers and students, students and fellow students or teachers and fellow teachers can communicate relatively easily without being limited by protocols.
- Utilising the advantages of computers (digital media and computer networks).
- Using self-learning materials are stored on computers so that they can be accessed by teachers and students without just anywhere where they need them.
- Utilizing the lesson schedule, curriculum, results of learning progress and matters relating to the administration of education can be seen at any time on the computer.

To implement blended learning, you can use the CoI (community of inquiry) framework. This framework has three elements, namely: social element, cognitive element, and teaching element. The social element ensures that students in the inquiry community feel free to express themselves openly in the way they like. The cognitive element is the basis of the inquiry process. The inquiry includes the integration of reflective and interactive processes. The teaching element presents the design, facilities, and direction to create a valuable learning experience.

Many blended learning models have been developed. Here are some blended learning models that have been applied by various educational institutions in various parts of the world:

5.1. Station Rotation Blended Learning

Station-rotation blended learning is a model that allows students to achieve learning goals by circling the learning stations through a specific schedule, where at least one of the stations is an online learning station.
5.2. **Lab Rotation Blended Learning**
The Blended Learning Lab Rotation Learning model is similar to Station Rotation; students have the opportunity for students to rotate the station through a predetermined schedule but is done using a specialized computer laboratory that allows for flexible scheduling with the teacher.

5.3. **Remote Blended Learning or Enriched Virtual**
In Remote Blended Learning, students focus on completing online learning; they do face-to-face learning with teachers only occasionally as needed.

5.4. **Flex Blended Learning**
Flex is included in the type of Blended Learning model where online learning is the core or backbone of student learning but is still supported by offline learning activities.

5.5. **The 'Flipped Classroom' Blended Learning**
Blended learning This version of Flipped Classroom is the most widely known version, Flipped Classroom starts from student learning that is done online outside the classroom or at home with content that has been provided previously.

5.6. **Individual Rotation Blended Learning**
The Individual Rotation model allows students to rotate through stations, but according to individual schedules set by the teacher or by software algorithms.

6. **Other Models**
In addition to the six models, there are still other models, although not yet familiar, to use it would not hurt for us to discuss here. Blended learning models are likely to continue to develop and have many variants. At least several models have begun to be widely used in several educational institutions, including:

6.1. **Project-Based Blended Learning**
Project-Based Blended Learning is a learning model in which students use online learning as well as face-to-face teaching and collaboration to design, repeat, and arrange project-based or product-specific learning tasks. Online learning can be in the form of online learning with forms or materials that have been prepared or independent access to learning resources needed. The main characters in this learning are the use of online resources to support project-based learning.

6.2. **Self-Directed Blended Learning**
In Self-Directed Blended Learning, students run a combination of online and face-to-face learning in inquiry learning and achieving formal learning goals. They are connected with the teacher physically and digitally. Because learning is self-directed, the roles of online learning and teachers change, and there are no formal online meetings/learning that must be completed.

   One of the things that challenge the teacher in this learning is how he assesses the learning and success of student learning experiences without eliminating authentication. While the challenge for students is how to find product models, processes, and potentials that can encourage them to be consistent in learning, also, students must understand what works and why, and make appropriate adjustments to conditions that are not in line with expectations or ideal conditions. Some students do not need guidance, while others need support through apparent channels so that they can carry out their learning autonomously.

6.3. **Blended Learning Inside-Out**
In blended learning Inside-Out, learning is designed to be completed or ended outside the classroom by combining the advantages of physical and digital face-to-face. However, in the model Outside-In and
In-Outside, still includes classroom learning, online learning while functioning as an amplifier. The online learning component can be an independent inquiry or formal eLearning.

When viewed from the learning patterns, project-based blended learning is one of the excellent examples of the Inside-Out model. Similar to Outside-In, this model still needs expert guidance, learning feedback, content teaching, and psychological and moral support from face-to-face interactions every day.

6.4. Outside-In Blended Learning
In Outside-In Blended Learning, learning begins with the non-academic physical and digital environment that students usually use every day and then ends in the classroom. Thus learning in the classroom will be deeper and more productive. Face to face classes have the opportunity to be a place to share, create, collaborate, and provide feedback to each other that can improve the quality of student learning.

When well designed, each "area" of learning can play an essential role in their complementary strengths. This learning pattern still needs guidance, teaching, and support from face to face interactions every day.

6.5. Supplemental Blended Learning
In this model, students complete online learning fully to complement their face-to-face learning or fully face-to-face learning to complement learning obtained online.

The big idea here is "complement." Achievement of learning objectives is necessarily fulfilled entirely in one "room" (face to face or online) while other "spaces" provide new experiences that are specific to students. This new experience will not get if only using one "space."

6.6. Mastery-Based Blended Learning
In the Mastery-Based Blended Learning model students do online learning and face-to-face learning in turns. Completion of mastery-based learning objectives. The design and proportion of online and face-to-face learning are built on the mastery of specific competencies.

Design assessment is critical in any mastery-based learning experience. The ability to use face-to-face and digital assessment tools is quite complex, depending on the learning design mindset.

7. Conclusion
Blended learning provides the best opportunity for learning from class transition to learning. Blended learning involves class (or face-to-face) and online learning. This method is beneficial for adding efficiency to classroom instruction and allowing increased discussion or reviewing information outside the classroom.

The application of Blended Learning to educators and training for educators and education staff is beneficial in efforts to improve the competence and professionalism of educators and education staff. This is because the implementation of Blended Learning can reduce the time and cost of implementing training, so that educators can still carry out their primary tasks, namely teaching well. Blended learning is a learning model that can increase attractiveness in the face-to-face learning process and is very suitable to be applied in the 21st era. Blended learning can accommodate broad technological developments without having to leave face-to-face learning (face-to-face) in a class by combining face-to-face learning with e-learning. Blended learning allows students to continue learning and follow the learning process. This can be an opportunity for the success of teachers and students in learning. Blended learning also helps teachers prepare students to create a learning environment following each student's learning style and can help students face challenges in the future.

Strengths of Blended Learning Blended learning is developed because of the weaknesses that arise in face-to-face learning (face-to-face) and e-learning. Besides being developed because of the emergence of weaknesses of both learning, blended learning was developed because of the advantages of face-to-face learning and e-learning. The advantages of blended learning expressed by Kusairi (in
Husamah 2014: 35), namely: a. Students are free to learn the subject matter in Blended Learning. - Declare, et al. - || 15 independently by utilizing material that is available online b. Students can communicate/discuss with teachers or other students that do not have to be done while in class (face to face) c. Learning activities carried out by students outside face-to-face hours can be managed and appropriately controlled by the instructor d. Instructors can add enrichment material through internet facilities e. the teacher can ask students to read the material or take a test conducted before learning f. teachers can organize quizzes, provide feedback, and use test results effectively. g. Students can share files with other students.

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