Initial design of blended learning for mathematics subject using the Kelase platform by adopting content of Tri Kaya Parisudha

I P W Ariawan¹, D G H Divayana² and P W A Suyasa³

¹Department of Mathematics Education, Universitas Pendidikan Ganesha
²,³Department of Information Technology Education, Universitas Pendidikan Ganesha

Email: *hendra.divayana@undiksha.ac.id

Abstract. Currently, e-learning is suitable to be used as one of the learning models in Mathematics subject on High School or Vocational School level as an impact of the presence of the 4.0 industrial revolution. However, this e-learning model is not always effective to be used to obtain quality learning outcomes because it can only be used to measure cognitive domains. To obtain learning outcomes in the cognitive, affective, and psychomotor domains, so another learning model innovation is needed. One model that can be used is blended learning for Mathematics subject using the Kelase platform with material content that is packaged based on the Tri Kaya Parisudha concept. The Kelase platform is used to create blended learning facilities that contain features needed to accommodate material content. The Tri Kaya Parisudha concept, which consists of manacika, wacika, and kayika, is used as the basic foundation for making material content that can measure cognitive, affective, and psychomotor domains. Based on those statements, the purpose of this study was to find out the general description of the initial design of blended learning for Mathematics subject (especially at the high school or vocational school level). The Kelase platform is used to create blended learning facilities that contain features needed to accommodate material content. The Tri Kaya Parisudha concept, which consists of manacika, wacika, and kayika, is used as the basic foundation for making material content that can measure cognitive, affective, and psychomotor domains. Based on those statements, the purpose of this study was to find out the general description of the initial design of blended learning for Mathematics subject (especially at the high school or vocational school level) that was created using the Kelase platform with material content based on the Tri Kaya Parisudha concept. The Kelase platform is used to create blended learning facilities that contain features needed to accommodate material content. The Tri Kaya Parisudha concept, which consists of manacika, wacika, and kayika, is used as the basic foundation for making material content that can measure cognitive, affective, and psychomotor domains. Based on those statements, the purpose of this study was to find out the general description of the initial design of blended learning for Mathematics subject (especially at the high school or vocational school level) that was created using the Kelase platform with material content based on Tri Kaya Parisudha. The method used in this study was R&D with the Borg and Gall model, which focuses on the stages of design development. The subjects involved in designing this blended learning were three people. The tools used to make blended learning designs, such as Kelase platform and Balsamiq Mockups. The results obtained in this study were the formation of an initial design of blended learning that created used Kelase platform by presenting facilities that could be used to fill Tri Kaya Parisudha-based Mathematics content.

Keywords: Blended Learning, Mathematics, Kelase Platform, Tri Kaya Parisudha

1. Introduction

Along with the rolling of current industrial revolution 4.0, all the lessons that are taught at the level of senior high school/vocational high school on Bali province, it is not exception Mathematics subject is also have well packaged through e-learning model. E-learning makes it easy for students to access Mathematics subject anytime and anywhere through internet access. Even though it has been packaged well through e-learning, however learning outcomes on the affective and psychomotor domains have not been achieved because the e-learning model is more focused on measuring the cognitive domains of students. Besides, the content of Mathematics subject material at the level of senior high school/vocational high school which is presented through e-learning is also not optimal yet to be able used to measure students' cognitive abilities start from the elementary to the advanced level. Based on those problems, it is necessary to innovate towards the learning model, which is used at the level of senior
high school/vocational high school, especially in relation to Mathematics Subject. The innovations that can be made are in the form of blended learning for Mathematics subject using the Kelase platform with material content based on the Tri Kaya Parisudha concept. Referring to that innovation, so the main objective of this research was to recognize the initial design form of blended learning for Mathematics Subject based on Kelase platform with content that was integrated with Tri Kaya Parisudha concept. The question in this study was, “How was the initial design form of the Kelase platform-based blended learning model that has material content which adopts the Tri Kaya Parisudha concept?”

This research emerged based on the obstacles finding from researches that had been carried out by previous researchers. The research that was conducted by Wariati in 2016 about “Tri Kaya Parisudha based education in the family” [1] showed that the Tri Kaya Parisudha concept could be used as a character education foundation in the family environment. The obstacle that was still found in Wariati’s research was not yet shown the learning outcomes in the cognitive domain because in Wariati’s research was more focus on the learning outcomes of affective and psychomotor domains that were manifested through the control of 10 characters in Tri Kaya Parisudha concept to obtain positive characters. Research in 2018 that was conducted by Ilhami, Riaindi, and Sriyati [2] about “implementation of science learning with local wisdom approach toward environmental literacy” with the results of research which showed that local culture that was related to environmental preservation could strengthen the scientific concepts that students get in the cognitive, affective, and psychomotor domains. The thing that had not been seen in Ilhami, Riaindi, and Sriyati’s research was the level of students’ understanding toward material that was obtained a start from the easy to the hardest level. Research that was conducted by Ningrum in 2015 about “learning model based on local wisdom to embed the ethics land for students” [3] showed that learning models based on local wisdom could be used to instill earth ethics through six components, including rationale, competence, syntax, learning outcomes, accompaniment impacts, and instructional design. The obstacle in Ningrum’s research was the absence yet of detailed explanations related to learning outcomes in the cognitive, affective, and psychomotor domains which were determined based on the local wisdom foundation. Research that was conducted by Anggraeni and Yonanda in 2018 on “the development of teaching materials based on local wisdom in jigsaw learning model for description of writing skills” [4] revealed that one of the ways to develop teaching materials through step-by-step that fits the needs and characteristics of students is by adding local wisdom. The obstacle that was found in Anggraeni and Yonanda’s research was that the content of teaching materials had not been packaged in detail to meet the needs of obtaining learning outcomes in the cognitive, affective, and psychomotor domains. Sugiy and Purwastuti [5] in a research that had been conducted by them on 2017 about “local wisdom-based character education model in elementary school in Bantul Yogyakarta Indonesia” stated that character education based on local wisdom that was applied at the elementary school level in Bantul had able to show learning outcomes on the cognitive domain by inserting the traditional song “Cublak-cublak Suweng” in the learning process. Besides that, the affective domain was obtained by inserting games and traditional song “Gundhul-gundhul Pacul” in the learning process while the psychomotor domain was obtained through the practice of crafts by making batik. The obstacle in Sugiy and Purwastuti’s research was that it had not shown in detail the difficulty level of the learning material from the highest to the lowest difficulty.

Research that was carried out by Atmaja and Subawa in 2018 on “human resource development model based on local wisdom Tri Kaya Parisudha in dealing with globalization” [6] showed that local wisdom could be used as a foundation for human resource development in the process of learning, education and job training through academic and non-academic activities so as to be able to realize competent human resources was reviewed of cognitive, affective, and psychomotor domains. The obstacle in Atmaja and Subawa’s research was that it had not shown in detail the stages of learning and job training that had been carried out structurally starting from the basic, intermediate, to advanced levels to obtain competent human resources. Sumardjoko and Musyiam [7] in 2018 carried out a research on “model of civic education learning based on the local wisdom for revitalizing values of Pancasila” stated that the increase in the character and cognitive student scores in following the civic education learning could be realized using a learning-based approach local wisdom. The obstacle in the research
that was conducted by Sumardjoko and Musyiam was that it had not shown an existence increase psychomotor scores of learners in the learning process. Research that was conducted in 2016 by Marhayani [8] regarding “development of character education based on local wisdom in indigenous people tengahan sedangagung” showed the values of local wisdom which were possessed by the Tengahan community could be used as a foundation in the development of character education especially in the affective domain and psychomotor through step-by-step. The obstacle that was found in Marhayani's research was that it had not shown a deep cognitive domain existence in the character education learning process. Dewi, Poedjiastoeti and Prahani in 2017 conducted a research on “ELSII learning model based local wisdom to improve students’ problem-solving skills and scientific communication” [9] showed that the ELSII learning model based on local wisdom could be used to obtain learning outcomes in cognitive domain through problem-solving skills, affective domain through scientific communication, and psychomotor domains through caring to maintain environmental balance. This ELSII model based on local wisdom also has similarities with the Tri Kaya Parisudha concept which is also able to show the cognitive realm through implementing ‘manacika’ (good thinking), affective domain through implementing ‘wacika’ (speaking well) and psychomotor domains through implementing ‘kayika’ (acting well). The obstacle that was found in Dewi, Poedjiastoeti, and Prahani’s research was that it had not fully demonstrated the learning process with material packages based on local wisdom starting from the easy to highest stages.

Research on “developing local wisdom based science learning design to establish positive character in elementary school” that was conducted in 2015 by Subali, Sopyan, and Ellianawati [10] showed 11 positive characters that could be developed in elementary school students selves through the design of local wisdom-based science learning, where of the 11 characters there were 7 characters that had increased. The seven characters, including thorough, disciplined, careful, honest, diligent, caring for the environment, and responsibility. The obstacle which was found in the research that was conducted by Subali, Sopyan, and Ellianawati was that it had not shown in detail the local wisdom-based science learning process ranging from the lowest to the highest level of material difficulty. Vasantan [11] in his research on “blended learning method based on local wisdom as a spiritual guidance Holy Trinity Community (HTC) in Bengkayang district” that was conducted in 2016 showed that local wisdom-based blended learning could facilitate HTC members in obtaining spiritual guidance by containing content material about ethics, morals, and values through conventional learning (face-to-face) that was conducted in the classroom or through internet access done everywhere (both while in class and outside the classroom). The obstacle that was found in Vasantan’s research was material content that has not been packaged with difficulty levels from the lowest to the highest. The research that was conducted by Divayana in 2018 on “Development of ANEKA-Weighted Product evaluation model based on Tri Kaya Parisudha in computer learning on vocational school” [12] showed the Tri Kaya Parisudha concept that could be used as a basis for determining a positive character that the most dominant in the computer learning process at Vocational High Schools and ANEKA concept that was used to assess learning outcomes in the cognitive, affective and psychomotor domains. The research obstacle of Divayana was that it had not been able to show the content of the material which was used in the computer learning process from the level of quality and difficulty the lowest to the highest level. Based on the problem formulation, the research purpose and some of the research results that background this research, so authors were interested in conducting research that focuses on developing the initial draft of blended learning for Mathematics subject at the Senior High School/Vocational High School level using the Kelase application with Tri Kaya Parisudha-based material content.

2. Method
The method that was used in this research was the research and development method with the Borg & Gall model, which has ten stages of development, but specifically in this research using the stage of design development. The subjects that were involved in the design development were three peoples with the following details: 1 person had expertise in the field of mathematics education that made material content, and two people had expertise in the field of informatics engineering which designed the blended
learning system. The application that was used in making the design of the blended learning model was the Kelase and Balsamiq Mockups application. The Kelase application was used to make the design a storage container for Tri Kaya Parisudha-based Mathematics material content, while the Balsamiq Mockups application was used to create a user interface design from blended learning. The time that was needed to complete the design was for two weeks. The location for making the blended learning design was carried out in the Informatics Engineering Education laboratory, Universitas Pendidikan Ganesha.

3. Results and Discussion
The implementation of this research resulted in a preliminary design of blended learning that was made using the Kelase application with Mathematical material content based on the Tri Kaya Parisudha concept which could be used in the learning process to obtain learning outcomes in the cognitive domains of students from beginner to advanced level, student affective domain, and student psychomotor domains. The initial design form of the blended learning model can be seen in Figure 1.

![Figure 1. The Blended Learning Display of Mathematics Subjects Based on Kelase-Tri Kaya Parisudha](image-url)
Figure 1 shows the blended learning display that was made using the Kelase application to facilitate the content of Mathematical material with tiered packaging based on Tri Kaya Parisudha. The Kelase application consists of several menus, including dashboard menu, learning menu, personal menu, activity menu, community menu, and communicator menu. The dashboard menu consists of 3 forms, including the form to make class, form creating friendship facilities, form to create community. The learning menu contains forms to be able to create discussion forums, add/insert material content, make assignments, and make quiz questions for a particular topic. The personal menu is used to see what activities have been carried out by the blended learning user and edited the blended learning user profile. Activity menu is used to view activities from schedules of learning activities. The community menu is used to create a community that was followed by blended learning users. The communicator menu is used as a facility to display a list of conversations/discussions that had been carried out by blended learning users (teachers and students). The Balsamiq Mockup application is used to create a simulation image to include the content of the High School/Vocational Mathematics level that was in digital format with tiered packaging ranging from the lowest to the highest difficulty level based on the Tri Kaya Parisudha concept so that it could manifest learning outcomes on the affective domain (referring to the Wacika concept), cognitive (referring to the Manacika concept) and psychomotor (referring to the Kayika concept).

The initial design result of blended learning for Mathematics subjects were able to answer the research weaknesses that was conducted by Wariati; Ningrum’s research; Anggraeni and Yonanda’s research; Sumardjoko and Musyiam’s research; Marhayani’s research; by showing the existence of facilities to include content of Mathematical material that could be used to measure learning outcomes on the cognitive, affective and psychomotor domains by referring to the Tri Kaya Parisudha concept. Research obstacles of Ilhami, Riandi, and Sriyati; obstacles of Sugiy and Purwastuti’s research ; obstacles of Atmaja and Subawa’s research; obstacles of Dewi, Poedjiastuti and Prahani’s research; obstacles of Subali, Sopyan, and Ellianawati’s research; Divayana’s research; and Vasantan’s research had been answered using this research results in the form of facilities that could be used to insert material content, assignments, and quizzes starting from the level of the hardest, medium and easiest material.

The advantage of this research is becoming an innovation in the form of blended learning with the material content that adopted Tri Kaya Parisudha that has been able to become a solution from the obstacles which were found in previous researches regarding local wisdom-based blended learning. The obstacle in this study is the absence yet of an assessment process to determine the quality percentage from the initial design of blended learning that based on Kelase-Tri Kaya Parisudha for this Mathematics subject.

4. Conclusions
The initial design of blended learning to support the Mathematics learning process for senior high school/vocational high school level in Bali Province had been well made using Kelase and Balsamiq Mockups application so that it could show the existence of facilities to include material content with difficulty level from the lowest to highest based on Bali local wisdom (Tri Kaya Parisudha). The solution that can be suggested to solve the obstacle that was found in this research is to assess the initial design of blended learning by using a quality percentage formula with categorization that refers to the eleven scale quality standard score so that the assessment results is more accurate.

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