Development of a blended learning model using the online learning system (SIPDA), Universitas Negeri Medan

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Abstract: This study aims to produce a model of blended learning that is assisted by an Universitas Negeri Medan (Unimed) online learning system (SIPDA) that is valid, practical, and effective. The stages of developing a SIPDA-assisted Blended learning model consist of (1) preliminary stages, (2) prototyping stages, which include planning, evaluation, and revision, and (3) product assessment stages. The quality of the SIPDA-based Blended learning model refers to the quality criteria, according to Nieveen, which includes valid and practical measures. The study conducted at Unimed in the sixth-semester students of Mathematics Education Study Program. The instruments in this study consisted of (1) the validity assessment instruments of the component models and learning support tools, (2) the practical assessment instruments of lecturers and students. The results showed that the SIPDA-based blended learning model that included the syntax/steps of learning, social systems, reaction principles, support systems, and instructional and supportive impacts, along with learning support tools, had met valid and practical criteria.

Keywords: Sipda, blended learning

1. Introduction

At present, Universitas Negeri Medan is trying to develop an online learning system called SIPDA, in the hope of welcoming the 4.0 learning revolution, which is not limited by time and space. Many things must prepare so that teaching and learning activities can run effectively. Learning activities are one of the main focuses that must consider. Learning success is influenced by several components, namely teachers, students, infrastructure, and the environment [1, 2]. The excellent educator that we call the teacher or lecturer is the most critical and decisive factor because the educator is the person who is directly dealing with students in the learning process. In its implementation, learning must be more innovative.

During the learning process, several factors influence the achievement of learning objectives. Factors that must meet are the steps of knowledge, the role of educators and students in education, how educators respond to experience, and learning support systems. The learning model is a term that we often hear is part of the learning factor. [3] states that "an instructional model is a step-by-step procedure that leads to specific learning outcomes." According to [4] Learning models can be interpreted as conceptual frameworks that describe procedures which is systematic in organizing learning experiences to achieve specific learning goals and serves as a guide for learning designers and teachers to plan and implement learning activities.
The learning model is said to be interesting if the model can foster motivation and enthusiasm for students. According to [4], the development of learning models is intended to encourage and increase students' learning motivation so that they are not bored with the ongoing learning process.

The data in this study consisted of quantitative and qualitative data. Quantitative data obtained from the results of the validation assessment sheet by experts, practicality assessment sheets from lecturers and students. While qualitative in the form of input and advice from experts, colleagues, or students as material for improving learning models.

The study conducted at Unimed, a research method using research and development from [5]. The process is carried out through the stages of preliminary studies, development, and testing. The instruments used in this study consisted of (1) validity instruments, namely (a) validity assessment sheet components of the learning model, and (b) learning support appraisal sheets (Contracts, SAPs, and tests); practicality assessment instruments, namely: (a) assessment sheets from lecturers and (b) assessment questionnaires from students.

2. Results and Discussion
The validity of the SIPDA-based blended learning model determines by expert judgment. Scores obtained from the validity assessment sheet and the practicality of the learning model are converted into qualitative categorization, referring to the qualitative classification, according to [6] in Table 1. The learning model is said to be valid if the minimum expert evaluation of the learning model components and learning support devices reaches valid criteria. Furthermore, the SIPDA-based blended learning model is said to be practical, if the results of the assessment of lecturer and student peers reach a minimum of reasonable criteria.

### Table 1. Rules for the Conversion of Quantitative Data into Qualitative Data

| Score Interval                                                                 | Score | Category       |
|-------------------------------------------------------------------------------|-------|----------------|
| $M_i + 1.5SB_i < X \leq M_i + 3SB_i$                                         | A     | Very Good      |
| $M_i + 0.5SB_i < X \leq M_i + 1.5SB_i$                                        | B     | Good           |
| $M_i - 0.5SB_i < X \leq M_i + 0.5SB_i$                                        | C     | pretty good    |
| $M_i - 1.5SB_i < X \leq M_i - 0.5SB_i$                                        | D     | not good       |
| $M_i - 3SB_i < X \leq M_i - 1.5SB_i$                                          | E     | bad            |

The learning developed in this research is SIPDA-based blended learning consisting of syntax/steps of education, social systems, reaction principles, social systems, and instructional and accompaniment impacts — the following results obtained from this development research. Based on the results of expert evaluations of the validity of SIPDA-based blended learning models, it can show that the components of SIPDA-based blended learning reach valid criteria. The results of the expert assessment of the parts of the SIPDA-based blended learning model can see in Table 2 below.

### Table 2. Scores and Criteria results of the SIPDA-based Blended learning Model Validity Assessment

| No | Komponen       | Rata-rata Skor | Criteria  |
|----|----------------|----------------|-----------|
| 1  | Syntax         | 7              | Valid     |
| 2  | Social System  | 10,5           | very Valid|
| 3  | Accompeniment impact | 6,8 | Valid |
| 4  | Instructional  | 6,5            | Valid     |

Furthermore, the results of the validity assessment of learning support tools can summarize in Table 3 below.

### Table 3. Scores and Criteria Results of Validation Assessment of SIPDA-based Blended Learning Learning Tools

| Product | Everage Score | Criteria |
|---------|---------------|----------|
| RPP     | 50,67         | Valid    |
| Media   | 50,00         | Valid    |
| Test    | 60,93         | very valid |
Based on Table 3 above, it can show that the SIPDA-based blended learning support tools that include RPP, Media, and Tests have met valid criteria. Thus, the SIPDA-based mixed learning model meets valid criteria.

SIPDA-based blended learning components that have met valid criteria consist of syntax, social systems, reaction principles, support systems, and instructional impacts. The language of SIPDA-based blended learning consists of student orientation to the problem presented online for three first-time meetings and three subsequent meetings offline. In this phase, in general, the lecturer has a role in introducing the problem, in this case, every material during lecture and guiding students to be able to explore the guidance done when students make presentations, produce a list of questions and record initial thoughts and hypotheses about the problem. During the trial results of the learning model in the class subject, the issues of learning mathematics today, namely for six meetings, the orientation phase of the problem in learning mathematics can be carried out in the whole conference. The student organizations to learn, at this stage, the activity focuses on students working on projects to make teaching materials in the form of lesson plans and worksheets for each solution to the problems they encounter in the field. It did in groups, where student learning groups determine students themselves. At this stage, students are also required to be able to assess learning resources that can be used to solve problems.

At the first meeting, the percentage of the feasibility of the student orientation phase for learning is 50%. Seen from the results of the assignment of a video uploaded to YouTube then put it into SIPDA. It happens because students not yet accustomed to learning to look for problems, making solutions, and then simulating the resolutions they make in the form of video recordings. Besides, another thing that might be the cause is that students are not used to and not ready to study online with the SIPDA network system; some students cannot enter the system. However, at subsequent meetings, the student organization stage for learning could be carried out well, as indicated by the percentage of implementation, reaching 65%. At the fourth meeting, the interest in the feasibility of the activity step increased by 30%, i.e., 95%. The offline presentation of learning they were used to do, so they did not experience obstacles here and there based on information obtained from fellow researchers who become observers and the results of interviews with students. The lecturer, together with students, reflect or evaluate the learning process that has been done by students in the analysis and evaluation stage. This stage helps try to reveal any difficulties experienced by both lecturers and students. Like only the implementation of the scene of the presentation of work by students, the analysis and evaluation stages of the learning process initially can only reach 50%. However, at the second to the last meeting, the analysis and evaluation phase could be carried out 95%.

The social system in SIPDA-based blended learning includes the roles and relationships of students and lecturers in detail at each stage of learning. The social policy at the scene of problem orientation is the provision of material at the beginning of lectures to be presented by students controlled by the lecturer. The lecturer gives instructions in the form of whatever activities the students will do every week. Student organizations, in this case, the formation of groups for learning and completing the problem is very structured carried out by students and controlled by lecturers. Based on the analysis of the implementation of the SIPDA-based blended learning model, it can be seen that in the overall learning the lecturer has a role as a facilitator and supervisor, namely by conditioning students to learn, helping students to solve problems that cannot be done by students during the discussion room, and encouraging students to collect information from various sources. So be it has been able to do work in the form of videos uploaded to social networks and then upload them to discussion forums on SIPDA. The support system needed to be able to implement the SIPDA-based blended learning model is the Student Activity Sheet (LKS) to support more effective learning. In implementing learning support systems in the form of MFIs and learning media that stimulate students’ ability to think actively and creatively.

Based on the trial results of the SIPDA-based blended learning model, it can see the practicality of the SIPDA-based mixed learning model.
Table 4. Scores and Criteria of Practical Assessment Results

| Pertemuan | Score | Criteria        |
|-----------|-------|-----------------|
| I         | 25    | quite practical |
| II        | 30    | quite practical |
| III       | 40    | practical       |
| IV        | 45    | practical       |
| V         | 50    | very practical  |
| VI        | 51    | very practical  |
| Rerata    | 40.16 | practical       |

Based on Table 4 above, it can show that overall learning is as much as six times learning, the lecturer stated that overall, the SIPDA-based blended learning pursuit model developed had fulfilled practical criteria. However, it can see that from six meetings, as many as two learning meetings, lecturers stated they did not agree with the ease of SIPDA-based blended learning steps. It can be because students are not familiar with the SIPDA-based blended learning model. It is possible students don’t accustom to discussing with group members online, such as using chat tools and signals that are not good enough. During the discussion, the students left the forum suddenly and then entered the forum again, when asked why this is because internet signals are unstable. So a little trouble seeing the discussion that has been done by his friend. It provides input to researchers to make learning systems and blended learning scheduling even better.

3. Conclusions and suggestions

Conclusions

Based on the results of data analysis and discussion, the following conclusions can draw. First, the SIPDA-based blended learning model and the tools developed are empirically valid and reliable with the "Good" category, so that the SIPDA-based blended learning model is feasible to use as an alternative relevant learning model. A suggestion based on the results of research and discussion, as well as keeping in mind the implementation of the study; the following proposals can be submitted. First, the developed SIPDA-based blended learning model test for its validity, reliability, and practicality, so it is suggested to lecturers to use this SIPDA-based blended learning model as an alternative to relevant learning models. Second, lecturers should be able to modify the syntax that is following the characteristics of the material and needs in the field he first paragraphs after a heading is not indented

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