Analysis of student’s scientific attitude behaviour change effects blended learning supported by I-spring Suite 8 application

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Abstract. This article aims to describe the student's scientific attitude behaviour change as treatment effect of Blended Learning supported by I-Spring Suite 8 application on the material balance and the rotational dynamics. Blended Learning models is learning strategy that integrate between face-to-face learning and online learning by combination of various media. Blended Learning model supported I-Spring Suite 8 media setting can direct learning becomes interactive. Students are guided to actively interact with the media as well as with other students to discuss getting the concept by the phenomena or facts presented. The scientific attitude is a natural attitude of students in the learning process. In interactive learning, scientific attitude is so needed. The research was conducted using a model Lesson Study which consists of the stages Plan-Do-Check-Act (PDCA) and applied to the subject of learning is students at class XI MIPA 2 of Senior High School 6 Surakarta. The validity of the data used triangulation techniques of observation, interviews and document review. Based on the discussion, it can be concluded that the use of Blended Learning supported media I-Spring Suite 8 is able to give the effect of changes in student behaviour on all dimensions of scientific attitude that is inquisitive, respect the data or fact, critical thinking, discovery and creativity, open minded and cooperation, and perseverance. Display e-learning media supported student worksheet makes the students enthusiastically started earlier, the core until the end of learning.

1. Introduction

Implementation of learning in the curriculum 2013 is a learners-centred learning. The availability of good facilities and infrastructure including the internet facilities at most of schools need to be optimized for e-learning based learning. According to [9], e-learning is able to enhance the learning experience because students can learn anywhere and in any condition as long as they can access the internet without having a face to face learning. However, according to several research reveal that students would prefer a face to face learning to web based learning. Web based learning could be combined with face to face learning [2]. Therefore, there is needed to combine between e-learning and conventional learning in a class, called a blended learning model. At the high school level, this learning model is suitable to be applied because the student competent character still needs accompaniment from the learner. The blended learning is a learning strategy that integrates between face to face learning with a web based learning, which combines many varieties of media in a learning management system [13]. Blended learning integrates-or blends-learning programs in different
formats to achieve a common goal [20]. Thus, blended learning model consists of online learning component and face to face learning component so that the two components implementation of the learning division is noteworthy on two components will be suitable with the learning competence target. Related to this, [4] presents the learning alternative options, one of them is pure class model. In this model all learning activities are done in the classroom, but there are given tasks for the learners to access the internet/web. The research results [7] which is done in junior high school of the Surakarta Residency region shows that science learning through blended learning type of pure class effective applied in learning compared to four other learning model such as Learning Cycle 7E, Joyfull Learning, ARCS and Cooperatif Learning Type of TAI.

There are three main learning theories that are used as the basis for web based learning, namely: behaviorism, kognitivism and constructivism [23]. Blended learning model is the solution for the limitation hour of lessons that a teacher has with puts involvement of learners in the learning agenda focus on learners or Student Centered Learning. The participants have positive perceptions of blended learning approach [18]. It supports the opinion of the Humazah that states that blended learning open learning paradigm shift from teaching to learning centered toward the new paradigm that is centralized to the learners. In addition Huzamah also states that the model based on the mindset of Technological, Pedagogical, and Content Knowledge (TPACK). TPACK in implementation of learning is the necessity of teacher to think supporting lesson technologies, the lesson strategies (including approaches, models and methods), as well as what materials will be taught in order to make students reach to competencies target.

In practice, [8] mentions five keys as the guidelines for implementing the learning using blended learning, namely: 1) Live Event: is a direct learning or face-to-face (instructor-led instruction) that is synchronal in time and in the same place (classroom) or in the same time but in the different places (such as the virtual classroom) or in the same time but different places (such as the virtual classroom). 2) Self-Paced Learning: is combining a independent learning (self-placed learning) that allows the learners to learn anytime, anywhere using a variety of contents (learning materials) that are specifically designed for independent study are either text-based or multimedia-based (video, animations, simulations, images, audio, or a combination of all of them). 3) Collaboration: is combining collaboration, either a collaboration of teachers, or a collaboration among learners who can both cross-school/college, such as chat rooms, discussion forums, e-mail, website/weblog, mobile phone. 4) Assessment: is that the designer must be able to arrange assessments either assessment test or a non-test assessment, or a test that is more authentic (authentic assessment/portofolio) in the form of projects, products and so on. Besides that, it also needs to be considered the arrangement between the forms of online assessment and offline assessment. 5) Performance Support Materials: make sure that the learning materials in digital forms are accessible to the participants to learn in both offline and online. Hence, in a simple definition blended learning model is the learning model which combines the online version learning and the class version or face-to-face learning.

Underlining what are presented by [15], media support in the implementation of blended learning is something important. The software supporting packaging learning media e-learning based is evolving so rapidly, one of them is i-spring suite 8. It is a software to create fast learning tools produced by i-sprng to develop e-learning professional learning on power point which is linked to quizzes, surveys, and interaction [17]. I-spring is one of the tools that change the presentation file into flash and SCORM/AICC forms, which are forms that commonly used in e-learning through Learning Management System (LMS). The program i-spring suite 8 has swf extension which can easily connect to the internet by embedded it, so that it directs the learning into interactive one. Through the phenomena or facts presented above, students are directed to actively interact with the media display animations or other forms, as well as interact with other students to discuss in order to get the concept of learning in each stage. It is asserted by [10] that the finding indicates that students taught by computer supported animations were better than those in traditional teaching group.

In fact, the physics is a clump of science includes the process, products and attitudes. Hence, the results of learning physics are not only seen from the results of domain cognitive but also include
attitude. According to [6] attitudes are general evaluations people hold in regard to themselves, other people, objects, and issues. Scientific attitude in learning science is often associated with attitudes towards science [14]. According to [12] scientific attitude of learners are essentially no different from any other skills (cognitive, social, process and psychomotor). The scientific attitude is closely connected with the results of the learning learners. Bloom [6] refers to the importance of attitudes by stating the effect of affective domain behaviours in achieving cognitive domain behaviours in education. The scientific attitude is one of the factors that influence the results of the study [19]. Thus, it can be concluded that the scientific attitude is a form of intelligence or skills that are needed in the learning process and affect the results of his studies. The dimensions of attitude inquisitive, data/facts appreciative, critical thinking, discoveries and creativity, open minded and cooperation, diligence and environmental change sensitivity [14]. The description of the students attitudes in each dimensions is colored by learning techniques applied by the learners. Student Centered Learning (SCL) model will create a different description of students attitudes in Teacher Centered Learning (TCL). Student Centered Learning (SCL) seeks any dimensions will be developed optimally.

2. Methods

This research was conducted using a model Lesson Study. According to [16] lesson study is a systematic process used by teachers in Japan to test the teaching effectiveness in order to improve the learning outcomes. The systematic process is teachers work collaboratively to develop the learning plans and learning devices, doing observation, reflection and revision of learning plans in cycle and continuously. According to [16] lesson study is a model of the educators professions development through the learning teaching collaboratively and continuously based on the principle of kolegalitas and mutual learning to build a learning community in order to improve the teacher professionalism and the learning quality. Lesson study is a single instance of action research that consists of stages: 1) study: a Study curriculum and standard, consider long term goals and for student learning and development; 2) plan: select a research lesson, anticipate student thinking, data collection and lesson plan; 3) do research lesson: one team member, teaches other collect data; 4) Reflect: share data, what was learned about student learning, what are implication for this unit and more broadly, what understandings and new questions do we want to carry forward in our work. According to Wikipedia, Lesson Study is done through four stages by using the concept of Plan-Do-Check-Act (PDCA) [1].

2.1. The Stages of Planning (plan)

This step begins with an analysis of needs over the problems found in the study, namely that indication that teacher centered learning as well as the internet utilization as an e-learning based medium is not yet optimal. Further, the research teams together with physics teachers in the schools collaborate in lesson study to arrange a lesson plan which reflects students-centered based and e-learning based, in this case the blended learning model is applied. Through the lesson plan learning process becomes a very ripe plan, which can anticipate all possibilities that will occur during the learning implementation, either in the early, the core up to the final stage of learning.

2.2. The Stages of Implementation (do)

In this stage, there are two main activities, namely: the implementation of learning activities conducted by the model teacher to practice the lesson plan that is arranged together, and the observation activities on the learning implementation that are done by another member or lesson study community that is research team. There are some things that need to be noticed in the stage of implementation, namely: 1) the teacher do the learning as instructed in the lesson plan. 2) the students are attempted to be able to experience the learning process in a proper and natural setting, not in a under pressure condition that is caused by the lesson study program. 3) during the learning activities, observer is not allowed to interfere the teacher and student’ concentration. 4) the observers observes carefully towards the interaction of students, student-learning materials, students-teacher, students-other environments, using the observation instrument which has been previously prepared and compiled together. 5)
observers should be able to learn from the learning and not to evaluate the teacher. 6) observers can record via a video camera or a digital photo for documentation and materials analysis purposes as long as the recording activities do not interfere with the learning process. 7) observers take a note about the students’ attitude during the learning process takes place, for the example about the students’ comments or discussions and it is possible to write down the students’ name, there is a construction process of understanding of the related students. The note is made based on the guidelines and the sequences of students’ learning experiences that are listed in the lesson plan.

2.3. Stages of Reflection (check)
The stages of reflection activities are done in the form of discussion between the model teacher and the observer (research team), as in an improvement effort for further learning process. The discussion starts with model teacher conveys their impression after finishing the lesson plan, for examples their general or special impression of the learning process such as the difficulties or problems when doing the arranged lesson plan, including the effectiveness of e-learning media. Furthermore, all observers wisely deliver the response or the suggestions towards the learning process that has been implemented (not towards the teacher). When delivering suggestions, the observer must be supported by evidence obtained from observations, not just based on the opinions. The various talks that are developed in the discussion can be used as feedbacks to all participants for the correction or improvement purposes of the learning process.

2.4. The Stages of Follow Up (act)
From the results of the reflection activities, those can be acquired a number of new knowledge or important decisions in order to improve and enhance the learning process which refers to the learning targets. Those are as materials for model teacher as well as observer (research team) to develop a better learning process. The subject of this research is the Eleventh grade of MIPA 2 at SMAN 6 Surakarta. The object of this research is the scientific attitudes about student behavior on learning blended learning iSpring suite 8 based especially in the material of balance and rotation dynamic, which is done by two cycles of learning. The research data are obtained through observation techniques, then are validated through triangulation techniques namely interviews and document review. The data analysis technique that is used is descriptive analysis that refers to analysis models, [21] includes three components, namely 1) data reduction; 2) presentation of data; and 3) withdrawal and verification conclusion.

3. Finding and Discussion
Discussion of the student’s scientific attitude is based on the dimension of the scientific attitude. These dimensions include dimension of attitude of inquisitive, data/facts appreciative, critical thinking, discoveries and creativity, open minded and cooperation, diligence and environmental change sensitivity.

3.1. The Dimensions of The Inquisitive Attitude
The change off scientific attitude of student’s inquisitive attitude dimension on enthusiast indicator of looking for answer can be explained that in the pre-treatment learning process takes place through lectured method using Blackboard media, in the beginning of learning students get information about the material topic that will be taught, then teachers come into the core of learning, so that students tend to be passive. Different post treatment through blended learning based iSpring, in the beginning activities the lesson starts with showing e-learning media about phenomena related to the concept that will be taught, learners are enthusiastic about the problems, they sought an answer to the problem, and then the teacher directs the students to propose the hypotheses. The explained can be illustrated by figure 1,2.
3.2. The Dimensions of The Inquisitive Attitude

The change scientific attitude of student’s data/facts appreciative attitude dimensions on indicator of explain the observation result objectively/honestly can be explained that the activity of communicating is an activity that the most endeared of the most learners as they can communicate the results of their discussion expressively. In this activity, learners are seen showing a pretty good behaviour namely learners honestly communicate the observations the same with results of the discussion. It also occurs in learning through blended learning-based i-spring, students honestly present or communicate the discussion results of the group, however the activities look more structured because each member of the group is able to play in appropriate role and their responsibility. These explanations can be illustrated by figure 3,4.

3.3. The Dimensions of The Critical Thinking Attitude

The change of scientific attitude of students’ critical thinking attitude dimensions on the indicator of asking for any changes/new things can be explained that in the pre treatment although learning is
informative but in each step of the learning that has been finish by the teacher always give the opportunity to the students to ask about learners understanding, however the quantity of students who ask still few and students tend to passively follow the learning process, they are less concerned with the learning situation. In the learning through blended learning, the learners have a discussions in a group with the help of e-learning media i-spring based and learners’ activity sheet so that the learners in groups are practice to communicate their opinion with each other. Hence, the learners are being active to ask a friend or teacher related to the data analysis in learner activity sheet and new discovered things. These explanations can be illustrated by figure 5,6.

Figure 5. Scientific attitude of learners pre treatment on the dimension of the critical thinking attitude

Figure 6. Scientific attitude of learners post treatment on the dimension of the critical thinking attitude

3.4. The Dimensions of The Discoveries And Creativity Attitude
The change of scientific attitude of students’ discovery and creativity attitude dimensions on indicator of explaining the result of observations in with appropriate facts can be explained that in the pre treatment learning is informative, there is no chance to the students to have a discussion, students are less concerned with the learning situation, students’ activities summarize and record all the information that are conveyed by the teacher and open the guidance book. In learning through blended learning, guided by e-learning media and I-Spring based directs the students to do the steps of learning in groups, furthermore the students can summarize the learning result with their own understanding based on acquired data/facts, guided by the learners’ activity sheet that is explained by the teacher/downloaded in e-learning. These explanations can be illustrated by figure 7,8.
3.5. The Dimensions of The Open Minded And Cooperation Attitude
The change of scientific attitude of students’ open minded and cooperation attitude dimensions on indicator of willingness to renew the opinion and the conclusion can be explained that the students’ activity on the pre-treatment activities when class discussion, most of students tend to be passive when only accepting the class discussion results. It shows the learners’ boredom in the learning activities. In contrast from the study through blended learning i-spring based, class discussion is done critically so that new things can be found. Students actively express their opinion based on logical analysis and accurate evidence. These explanations can be illustrated by figure 9,10.
3.6. The Dimensions of The Diligence Attitude

The change of scientific attitude of students’ diligence attitude dimensions on indicator of completing scientific activities can be explained that at the time the pre treatment learners are given a group task in the end of the learning which has function to clarify the taught concepts, although has not yet completely done but still need to be submitted. This occurs over the teacher’s permission because the learning is oriented in weariness materials. In the study through blended learning i-spring based, the learning is oriented in the process where the learners are involved in the scientific learning steps which refers to the existing activity in learners’ activity sheet. Thus the learners’ task is not to end the learning process but it is integrated into the learning process based on the learning steps consecutively procedurally. These explanations can be illustrated by figure 11,12.

![Figure 11](image1.png)  ![Figure 12](image2.png)

**Figure 11.** Scientific attitude of learners pre treatment on the dimension of the diligence attitude

**Figure 12.** Scientific attitude of learners post treatment on the dimension of the diligence attitude

3.7. The Dimensions of The Environmental Change Sensitivity Attitude

The change of scientific attitude of students’ environmental change sensitivity attitude dimensions on indicator of actively participating in a group discussion can be explained that in the pre treatment learning process takes place using blackboard media as a learning medium and lecture method so that the learners tend to be less care in early learning. Different from the learning through blended learning i-spring based, supported by display e-learning media the learners become enthusiastic to learn by reading and asking the teacher about learners’ activity sheet which their group accepts. That is because the learners interest in the learning activities. These explanations can be illustrated by figure 13,14.

![Figure 13](image3.png)  ![Figure 14](image4.png)

**Figure 13.** Scientific attitude of learners pre treatment on the dimension of the environmental change sensitivity attitude

**Figure 14.** Scientific attitude of learners post treatment on the dimension of the environmental change sensitivity attitude

Based on the analysis presented, it can be concluded that the blended learning model that is supported by i-spring media can effectively change the students attitude which covers all dimensions of scientific attitude. The conclusions above reinforcement from multiple research results as summed up by [5] concerning about the effectiveness of i-spring media in the learning process can be concluded that the media is overall effective and suitable as a learning medium. Student scientific attitude that are taught with the STAD type cooperative learning combine with e-learning more positive (higher) compared with the student scientific attitude that are taught with the STAD type cooperative learning [11]. In addition, based on [3] about the i-spring media concludes that the usage of the computer learning media i-spring has a positive effect or can improve the learning outcomes of the profession program students at STIKes Karsa Husada.
Figure 13. Scientific attitude of learners pre treatment on the dimension of the environmental change sensitivity attitude

Figure 14. Scientific attitude of learners post treatment on the dimension of the environmental change sensitivity attitude

4. Conclusion and Recommendation

Based on the discussion, it can be concluded that the nature of Blended Learning model is a model of learning which combines online version learning and class or face to face learning. Either online learning or face-to-face learning are carried out based on existing guidance or chosen learning alternative. There are three main learning theories that are used as the basic for web-based learning, namely: behaviourism, cognitivism and constructivism. In addition, the model is based on the mind set of Technological, Pedagogical, and Content Knowledge (TPACK). The implementation of blended learning need a media support, namely i-spring suite 8. Through the phenomena or facts presented in media impressions, students are instructed to actively interact with media animations slide or other forms, as well as interact with other students to discuss in order to get the concept of learning at each stage of learning. The learning using blended learning which supports media i-spring suite 8 is able to give behaviour change effects on all dimensions of scientific attitude of students namely attitude of inquisitive, data/facts appreciative, critical thinking, discovery and creativity, open minded and cooperation, diligence and environmental change sensitivity. The results of this research can be used as the basic for further research and can be used as a joint effort among teachers, parents, students and schools in improving the quality of physics learning in a senior high school. The learning alternative or the learning guidance which is chosen in learning using blended learning must be adapted with the needs of the learning material, time allocation and personal computer facilities belonging to the learners.

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