Science-Based Quantum Learning Models In Elementary School

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Abstract. This study aims to analyze the need for the development of a scientific-based quantum learning model and the implementation of the development of this learning model in elementary schools. This qualitative descriptive research used observation, interview, and documentation study techniques by using the researcher as the main instrument. The data was analyzed by data reduction, data explanation, data comparison, and data conclusion steps. The data validity was done through triangulation. The study found that teachers still dominate learning in the classroom and its implementation tends to make students feel bored and bored with learning. There was lack of interaction between students and teachers. Many students do not understand the material and easily forget what they have just learned. Students didn’t know the essence of the subject matter being studied. Students do not have enough opportunities to fully develop their knowledge and skills. One of the learning models that can solve students’s problems in learning is by developing a scientific-based quantum learning model. It consists of learning syntax namely Grow, Experience, Name, Demonstrate, Repeat, Strengthen, Feedback, Conclude and Celebrate.

1. Introduction

Integrative thematic learning emphasizes the active involvement of students in the learning process, so that students can gain direct experience and are trained to be able to find out for themselves the various knowledge they are learning. Based on the Government Regulation No. 19.2005 concerning National Education Standards especially article 19, it is stated that learning should be carried out in an interactive, inspirational, fun, challenging, motivating way for students to participate actively, and provide space sufficient for initiative, creativity, and independence according to the talents, interests, and physical and psychological development of students.

[1] Motivation is a very important element of student success in the learning process. Because with the motivation will cause high interest in learning so that it affects learning achievement. [2] argued that in motivation there are also high aspirations and desires. So that students who have the motivation to learn will understand what the goals in learning are.[3] There is a significant influence between motivations on student achievement. [4] Low student motivation is an inhibiting factor in achieving educational goals and must be handled appropriately.

Accordingly, motivation becomes an important factors to encourage student enthusiasm for learning. Teacher has an important role as a facilitator in learning, and monitor the activities of students in the learning process so that classroom conditions remain comfortable, pleasant, and conducive and generate motivation in students to be active and cheerful in learning.
In fact, many teachers was unable to motivate students to take part in the learning process. The students listen more and only take notes on the material delivered by the teacher. Consequently these conditions have an impact on low student learning outcomes.

In responds to this, teachers should be creative and innovative in presenting learning materials that allow students to learn cheerfully so that they can obtain optimal results in learning process. Teachers should use appropriate learning models based on student characteristics. Therefore, it is necessary to analyze the needs of the learning model and its implementation in learning process.

2. Research Methods

This study uses descriptive qualitative method. [5] Qualitative research methods are research methods used to examine the conditions of natural objects where the researcher is the key instrument.

2.1 Data Source

Sources of data in this study were obtained from lecturers at Muria Kudus University and Class V SD teachers as well as fifth grade elementary school students in Polosoro Group of the UPT Pendidikan area, Jati District, Kudus Regency.

2.2 Data collection technique

The data was collected through observation, interview and documentation study by using observational guidance, interview guidance, and documentation study procedure.

2.3 Data Analysis Technique

Data collected in the study were analyzed through data reduction, explanation, comparison, and conclusion. Meanwhile, the credibility test was conducted by observation extension, determination increase in the research, triangulation, peer discussion, negative case analysis, and member check.

3. Result and Discussion

The problem experienced by most teachers was the lack of enthusiasm for student learning due to a lack of perceptions from the teacher. The students were less focused on learning to be carried out and students became less interested in learning. The lecture method which still dominates the activities of teachers in teaching results in students tending to be passive in lessons.

Another problem was lack of student attention to the teacher during learning takes place resulting in the classroom condition being not conducive and learning activities less effective. Low student attendance due to unreasonable various reason had caused the transfer of knowledge became obstructed. Many students do their homework at school, even only copying homework from friends. Some students quickly gave up in the face of difficulties and were not enthusiastic in following the lesson which is shown through non-concentration behaviors in class, such as sleepiness, not paying attention to the teacher when giving explanations of material in class. Students were busy chatting when learning is taking place and busy with their friends when explained by the teacher and students cannot answer the questions given by the teacher.

This condition was influenced by the way the teacher delivers learning. Teachers had difficulty arousing student motivation in participating in learning. Initial observations showed that teachers used an inappropriate learning model in classroom learning. Inappropriate use of learning models caused learning objectives cannot be achieved so that it can cause learning difficulties for students. Whereas learning model is an important element in teaching and learning activities to achieve learning objectives. The learning model is used by the teacher as a guide in planning classroom learning. The teacher must be able to use the right learning model so that it runs according to the expected learning scenario. [6] Varied and appropriate learning model can overcome student’s learning difficulties. [7] In every stage of the learning process, a learning model is needed that is able to encourage students to develop a thinking process in increasing students' creative ideas. [8] The learning model is used as a
guide to achieve learning objectives in which there are strategies, techniques, methods, materials, media and learning assessment tools.

One of the learning models that can be an option and accommodate these interests is the quantum and scientific learning model. This learning model is able to increase learning motivation and involve students to be active and understand the material properly in supporting teaching and learning process.

[9]Quantum learning can sharpen understanding and memory, and make learning a fun and rewarding process. [10]Quantum learning involves the work of the left and right brains, the sense of sight and listeners through visual, auditory and kinesthetic learning, experiential learning and simulations and games.[11]Quantum learning model can make students play an active role in learning, use initial provisions and develop it to obtain new knowledge that is useful for students. [12]Quantum Learning could make student be pleased, be active, be interested in following learning process. Quantum Learning is a learning method that gives important benefits. The students can be comfortable and motivated in joining the learning. It can make the learning as a process to make the lesson become happy and useful. Quantum learning provides more effective results because the basic principle in the quantum learning model is to create fun effective learning.

Sasmita and [13] Use of the quantum learning model is considered capable as an alternative to learning renewal, because it provides practical and specific instructions for creating an effective learning environment for how teachers design learning, delivering learning materials, and how to simplify the learning process so that it makes learning easier for students. The principle is that suggestions can and certainly affect the outcome of a learning situation, every detail gives a positive or negative suggestion. And through quantum learning, students will be invited to learn in a more comfortable and pleasant atmosphere, so that students will be more free to discover new experiences in their learning.[14] Scientific learning can encourage students to learn actively by devoting all their thoughts critically and analytically, in solving their learning problems. [15] Scientific learning can shape students' ability to solve problems systematically. Through scientific learning, learning conditions can be created where students feel that learning is a necessity. [16] By applying a scientific approach, the learning process will be more memorable and meaningful for students, because it invites students to acquire new knowledge and information independently that can come from anywhere, anytime, and does not depend on direct information from the teacher. Scientific learning encourages students to have an investigative spirit, have a high curiosity, so that they can build their own concepts through the learning experiences they experience and get learning that is challenging, fun, and meaningful. the scientific approach encourages students to actively construct the concept of learning through several stages of observing formulating problems, proposing hypotheses, collecting data, analyzing and drawing conclusions and communicating the data.

Student learning difficulties can be overcome by developing a scientific-based quantum learning model. The learning model consists of nine learning syntax that can be applied easily in student learning activities. The learning syntax was called TANDU KUSIR, namely Grow, Experience, Name, Demonstrate, Repeat, Strengthen, Feedback, Conclude and Celebrate, each learning stage has the characteristics of learning activities that can build student awareness to understand the subject matter completely. Here are the steps of scientific-based quantum learning model (Figure 1).
The growing stage, teachers can foster student interest by doing question and answer activities that are beneficial to students. Answering questions can create interest on the part of students in what is being learned and connect it to the real world, and also create optimism. The teacher provides motivation to students so that students know what the goals and benefits of learning are and are able to increase interest in learning in the learning process. This stage is combined with the stage of scientific learning, namely observing and asking questions. At the observing stage, students are invited to see, listen to, hear, and read things that are important from the objects or objects that are presented with or without tools. Thus, students not only observe auditively, but also visually. Learners can ask questions about information that is not understood from what is observed or questions to get additional information about what is observed. [18] The experience stage, the teacher provides students with learning experiences before a material is taught so that a natural desire to explore arises. This stage interrogates scientific learning in the form of gathering information and reasoning. This learning experience aims to explore and gather as much information as possible about the theme being discussed. This activity absolutely requires the activeness of students trying to interact with teachers and friends. The stage of collecting information requires students to provide temporary answers to problem formulation. [19] At the naming stage, the teacher presents, sorts and determines the main content. Students learn labeling, thinking skills, and academic strategies. Students add new content to existing schemas. [20] The teacher provides opportunities for students to build knowledge in the form of concepts, principles, and thinking skills based on the games students have played. In this case, the teacher can help students by providing questions, examples and illustrations. This stage is combined with the scientific learning stages, namely reasoning or associating. Students develop rational thinking skills. That is, the correct answer is not only based on arguments, but must be supported by data that is found and can be justified. In this activity, students collect data through experimental activities with work procedures that have been given to prove the hypothesis. [21] At the demonstration stage, the teacher provides the opportunity for students to show that they know and understand. Teachers give their students the freedom to express their ideas, present their work, and make positive interactions and take advantage of student differences to support learning. This stage is integrated with the stage of communicating in scientific learning, which is writing or telling what is found in information seeking activities, associating and finding patterns. These results are presented in class and assessed by the teacher as the learning outcomes of these students or groups of students. At the repeating stage, the teacher asks students to repeat the previously taught learning material to enter new material, but the new material still has something to do with the previous material. It means that the students reiterate, emphasize and infer the learning material. [22] At the strengthen stage, the teacher provides reinforcement to students with a response to student behavior in teaching and learning activities, so that students are encouraged to increase this positive behavior. It can increase or stimulate student attention to learning activities, increase motivation, and stimulate learning.
Feedback is an important part of teaching and learning activities. Feedback greatly affects student motivation and interest in learning. Feedback can help students and teachers focus on future learning. Summing up what has been learned is one of the closing steps in learning. Closing the lesson is an activity carried out by the teacher to find out the achievement of goals and students' understanding of the material that has been studied, and to end learning activities.

Celebrate is the recognition and appreciation to every accomplishment of participation and the acquisition of knowledge and skill. Teacher can give applause, smile, or something that can encourage students motivation.

[23] Celebration can be in the form of giving gift, praising, nodding showing approval, smiling, giving point, thumb up, applause, three times yeah, poster display, and things that can arouse students’ positive self perception. Celebration in quantum learning is very important. Celebration can build a desire for success in learning.

Scientific-based quantum learning can make students happy, active and interested in following the learning process. students feel comfortable and motivated in participating in learning so that learning activities can provide benefits for students. Quantum learning is a learning method that provides important benefits. Students can feel comfortable and motivated in participating in learning. It can make learning a process to make learning happy and useful. Each stage in the scientific-based quantum learning model can be implemented into various forms of student learning activities. teachers can modify learning activities according to student conditions. The following Table 1 is the implementation of a scientific-based quantum learning model.

| No | Leaning Syntax | Leaning Activities |
|----|----------------|-------------------|
| 1  | Grow           | • Students asked to watch a video show related to the subject  
                       • Students and teachers ask questions about the video they have seen  
                       • The teacher tells students that they will get a variety of information from the video |
| 2  | Experience     | • Students are asked to read the material according to the subject matter  
                       • The teacher monitors and ensures that the material reading activities runs in an orderly manner |
| 3  | Name           | • In groups or individually, students work on worksheets according to the subject matter  
                       • The teacher monitors the work of each group and provides explanations and assistance to groups that are experiencing difficulties. The teacher makes sure that every student in the group is actively involved in the discussion. |
| 4  | Demonstrate    | • Each group is asked to present the results of their group in front of the class. Other groups can respond to other group presentations.  
                       • Asking relevant questions to help students find answers to the problems discussed  
                       • The teacher stimulates interaction between students during the presentation and the question and answer takes place |
| 5  | Repeat         | • Students make important notes according to the subject discussed together  
                       • The teacher guides students in making important notes |
| 6  | Strengthen     | • The teacher discusses the results of the discussion |
4. Conclusion

Based on the results and discussion that has been outlined in the previous chapter, it can be concluded that teachers still dominate learning in the classroom and its implementation tends to make students feel bored and bored with learning. There was lack of interaction between students and teachers. Many students do not understand the material and easily forget what they have just learned. Students didn’t not know the essence of the subject matter being studied. Students do not have enough opportunities to fully develop their knowledge and skills. The implementation of scientific-based quantum learning models nine learning syntax that can be applied easily in student learning activities. The learning syntax was called TANDU KUSIR, namely Grow, Experience, Name, Demonstrate, Repeat, Strengthen, Feedback, Conclude and Celebrate. each learning stage has the characteristics of learning activities that can build student awareness to understand the subject matter completely. Regarding to the conclusions that have been described, the suggestions that can be given in this research are the teacher can develop scientific-based quantum learning for different materials and subjects for further investigation.

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