URGENCY OF 21ST CENTURY LEARNING INQUIRY-BASED LEARNING MODELS: LITERATURE REVIEW

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Abstract :
Education today has led to the importance of 21st century learning. The 21st century directs life to four pillars, namely learning to know, learning to do, learning to be and learning to live together. The four pillars contain specific skills to be developed in the learning process such as communication skills, critical thinking, collaboration, creation and innovation, information literacy, and problem solving. This study reviews the importance of the role of 21st century learning in the inquiry based learning model as a learning model that can solve the challenges of the 21st century. Based on the results of the analysis of the articles on the inquiry based learning model, it was found that the inquiry based learning model is one of the learning models that can be used in the 21st century to guide students to achieve the four skills in the 21st century. The inquiry learning model is a learning model that prepares students in situations to conduct their own experiments so that they can think critically to seek and find answers to a questionable problem. Inquiry allows students to have free space for students to learn, but provides clear boundaries of exploration.

Keywords: Inquiry Based Learning, Learning, 21st Century, Literature Review

INTRODUCTION

Education is one of the efforts to improve human life for the better. In the education system in Indonesia, to achieve national education goals, various innovations are needed to awaken the abilities of students and can become active and independent learners (Jayanti et al., 2021). Education will continue to experience changes to keep up with the times and currently the world of education is in the 21st century (Mardhiyah et al., 2021). This is marked by the increasingly rapid development of science and technology (Samudra & Yulkifli, 2019). Therefore, educators as an important component in learning should provide guidance in developing students' skills to achieve learning objectives. So, students can adapt to think critically, creatively, collaboratively and communicatively in 21st century learning (Munawarrah, 2020).

21st century learning is defined as learning that provides 21st century skills to students, namely 4C skills which include: communication, collaboration, critical thinking and problem solving, and creative and innovative (Aji, 2019). The 21st century demands that students have high-level thinking skills and 21st century skills (Syahana & Andromeda, 2021). 21st century skills provide several innovative learning approaches and several new ideas as learning models (Sulistyaningrum et al., 2019). Several studies have shown that the skills needed by students to face the challenges of the 21st century have not been matched by appropriate learning.

The context of learning in the 21st century leads teachers to think whether they will continue to play the role of "sage-on-the-stage" or change their role to "guide-on-the-side" and "meddler-in-the middle" (Wahyuddin, 2021). In connection with the teacher's role as a facilitator in 21st century learning, several competencies such as pedagogic, social, personality, and teacher professionalism also need to be developed according to learning trends. Of the four competencies, pedagogic and professional competencies have a very strong correlation with the achievement of student learning outcomes (Jan, 2017).

Understanding of students, designing and implementing learning, evaluating learning outcomes, and developing students to actualize their various potentials will be determined by the extent to which the teacher's pedagogical competence in designing learning takes into account the demands of the curriculum (Putri & Subowo, 2020). In terms of how to combine concepts, skills, topics, and thematic units, according to an expert named Robin Fogarty, there are ten ways or models for planning integrated learning. The ten ways or models are: (1) fragmented, (2) connected, (3) nested, (4) sequenced, (5) shared, (6) webbed, (7) threaded, (8) integrated, (9) immersed, and (10) networked (Fogarty, 1991). So, teachers can design integrative learning by choosing one form of the integration model into an appropriate learning model according to 21st century learning.

One of the 21st century learning trends that teachers must understand is inquiry based learning, because several studies have stated that inquiry based learning is a learning design that has enormous potential for developing the skills needed by students in the 21st century (Chu et al., 2021). The combination of inquiry based learning with other approaches such as the Science, Technology, Engineering, Mathematics (STEM) approach also provides an overview of potential results (Ssunan et al., 2020). With regard to teacher competence and the implementation of inquiry-based learning, in the teaching and learning process the teacher should be able to create a suitable learning design for inquiry learning in the 21st century and of course adapted to the concepts to be taught. This study aims to show that inquiry learning can fulfill all the expected achievements in science learning. That way, students are able to become quality individuals who are ready to compete.

RESEARCH METHOD

Study this as form contribution researcher education so you can understand learning 21st century, especially in the inquiry-based learning model. Study this is type study References is series related activities with method collection of library data, reading and taking notes as well as process ingredient collection library just without need research field (Yahya, 2015). Study library (library research), also can interpreted series related activities with method collection of library data (Septikasari & Frasandy, 2018). Study this conducted with method analysis study References with study a number of that article general expose related learning 21st century and related learning inquiry based learning. Ingredient analysis sourced from journal reputable, books, proceedings, and reports results discussion (Nasihuddin, 2021). Study this in a manner implicit show exists role important deep learning based inquiry inquiry model form Skills students to be able face development education in the 21st century.

RESULTS AND DISCUSSION

Research 21st century education is an effort to maintain and develop ethical values and core performance in students that are widely recognized and accepted by all cultures (Septiani & Susanti, 2021). Conventional learning assesses that there are three stages of learning, namely developing basic skills according to the domain; obtain relevant content to solve problems in the domain; and learn how to apply knowledge. Explanations that are not defined in detail can make students feel pressured in learning (Blessinger & Carfora, 2015).

Science is a way of finding out about the natural surroundings in a systematic way, so it is not enough just to memorize but you have to understand the concept (Petek, 2013). The 21st century science learning does not only emphasize cognitive abilities, but also students' process skills (Yurdani, et al., 2019). The 21st century brought the development of science and technology and a change in the educational paradigm in curriculum, media and technology. Learning can no longer be separated from technology (Jeskova, 2016). Changes in the paradigm of education do not only occur in Indonesia, but occur universally. UNESCO (Education Commission for The 21st Century) recommends 4 pillars of education that can be used as the basis for education including: 1) learning to know, namely the attitude of always being curious and willing to find out; 2) learning to do, namely the attitude of combining methods or actions with knowledge; 3) learning to be, namely learning to recognize yourself and adapt to the environment; and 4). learning to live together, namely learning to live life together so that they can compete in a healthy manner, cooperate, and respect others (Hosnan, et al., 2014).

There are many ways to train higher-order thinking skills. One of them is through inquiry learning. Inquiry is known in various forms (Sari et al., 2017). Inquiry can be known as an approach, technique, and science learning model (Dewi, 2016). Many advantages are obtained in inquiry learning compared to traditional learning (Ertikanto, 2014). Inquiry learning stands on the assumption that from birth humans have the urge to find their own knowledge. Curiosity continues to develop into adulthood with the brain and mind. Curiosity creates meaningful knowledge for someone (Lee, 2012). Inquiry learning has existed for a long time (Yulianingsih & Hadisaputro, 2013). Inquiry learning is characterized by placing students and teachers in their capacity, confident in responding and giving opinions, having the goal of analyzing a problem (Astuti & Setiawan, 2013).

Inquiry is an approach to gaining knowledge and understanding by asking questions, observing, investigating, analyzing, and evaluating. Improved learning outcomes are obtained through active group discussions, so that information can be found on the material being studied (Juniati & Widiana, 2017) and have the opportunity to process information (Pedeste et al., 2015). The inquiry learning process will not be achieved if educators do not have knowledge of inquiry and it is known that inquiry learning is an international standard used in science learning (Fischer et al., 2014). Inquiry as a learning method has stages, namely formulating problems, making hypotheses, designing and conducting experiments, analyzing data, and concluding. Students become more active and creative because they find new concepts, patterns and structures, as well as build thoughts so that concrete knowledge is formed in learning science. This makes students' understanding last a long time and increase compared to only receiving information from educators (Anggraeni et al., 2013).

Inquiry or scientific inquiry is at the heart of science and science learning (Lederman et al., 2013). Science teaching should engage students in inquiry. Students link their scientific knowledge with scientific knowledge from various sources. Inquiry learning is applied so that students are free to elaborate on the concepts being studied, not just material that is recorded and memorized (Delors, 2013). The inquiry learning model provides opportunities for students to actively solve problems and practice group collaboration so that critical interactions are formed in learning (Septiani & Susanti, 2021). Investigation is the process of obtaining information through investigation and pursuing pro or contra evidence (Aisiyah, 2014) often carried out privately and voluntarily by people who want to know certain phenomena. Scientific inquiry combines traditional science processes, knowledge, scientific reasoning, developing scientific knowledge with critical thinking. Scientific questions refer to the systematic approach used by scientists to answer questions (Anam, 2016). Inquiry learning can be seen as a constructivism strategy that builds its own knowledge. This learning gives students real experience in solving authentic and relevant problems (Nahak & Bulu, 2020).

Inquiry learning begins with simple problems, developed into complex ones through direct experience and inspires natural curiosity (Shofiyah, 2017). This strategy increases understanding of concepts and learning motivation because students are active in investigations. The investigation consists of learning stages that train science process skills (Wenning & Khan, 2011). In the process, educators act as facilitators and students independently master the entire process (Yustini et al., 2018). Inquiry generally involves emotions so that scientific procedure activities can be directed and able to answer curiosity (Liewellyn, 2011).

If inquiry is an approach, there are three types, namely guided inquiry, modified free inquiry, and free or open inquiry (Linn & Eylon, 2011). Guided inquiry emphasizes thinking processes based on

learning processes, learning outcomes, and developing student potential (Fuad et al., 2017). Guided inquiry can improve thinking skills (Artayasa, 2018), even in laboratory learning (Artayasa, 2017). Modified free inquiry has less guidance than guided inquiry however, more direction than free inquiry (Tatar, 2012).

If inquiry learning is seen as a learning model, then each level of inquiry consists of five fully integrated stages. There are three types of inquiry learning models, namely free, guided, and modification-free inquiry (Corlu & Corlu, 2012). Inquiry is considered to have three different levels, namely structured inquiry (level 2), guided (level 3), open (level 4) (Gutwill & Allen, 2012). The four levels of inquiry are demonstrated, structured, guided, and open inquiry (Adi et al., 2017). The higher the level, the more student roles. The four levels have different characteristics, so they can develop different abilities, but teachers generally only apply one level of inquiry in one period (Septiani & Susanti, 2017).

Students who study with guided inquiry recognize that the learning model is quite interesting and interactive because the teacher gives experimental questions that motivate discussion and maximize learning activities (Septiani & Susanti, 2021). However, the large number of students is an obstacle for teachers to ensure that all students are involved in activities (Astani, 2020). Therefore, to overcome these obstacles reference (Sari et al., 2017) explains the role of teachers and students in inquiry learning. The role of the teacher includes: 1) preparing student- centered learning through knowledge and experience constructs, focusing on active inquiry; 2) focus on one or more questions as an active way of inquiry; 3) get to know the way students think and ask questions; 4) familiarize discussion in learning; 5) prepare the inquiry and investigation stages. Then, the roles of students are: 1) observation and collecting data; 2) create hypotheses and experiments for verification; 3) find cause and effect; 4) connecting the dependent and independent variables; 5) explain the consequences or reasons; 6) draw conclusions based on data; 7) defend conclusions that are considered correct based on data; 8) interpretation of observation data; 9) find their own way to report findings to all students.

One level of inquiry can have different phases. The inquiry phase consists of asking questions, designing studies, collecting and interpreting data, concluding (Septiani & Susanti, 2021). The inquiry phase is in the form of theory, hypotheses that can be tested, search and analyze data, refine theory (Wijayanti, 2017). The inquiry phase is problem identification, analysis, making hypotheses, concluding, solving problems and designing experiments (Sulistina, 2012). In addition, there are 7 phases of inquiry, including making questions, predicting, designing experiments, analyzing data, reasoning with models, concluding, conveying results (Septiani & Susanti, 2021). However, it is generally known that the core phases of inquiry include making questions and hypotheses, investigating, analyzing, concluding and communicating.

CONCLUSION

The inquiry learning model is a learning model that prepares students in situations to conduct their own experiments so that they can think critically to seek and find answers to a questionable problem. Inquiry allows students to have free space for students to learn, but provides clear boundaries of exploration. Learning science in the 21st century requires educators to better prepare dynamic learning outcomes. Students are required to be more independent in learning. Reliance on learning that does not support students discovering concepts should be reduced. It is important to apply inquiry learning because learning does not only focus on knowledge, but on students' process skills. Inquiry learning with a core activity in the form of investigation supports the creation of dynamic learning if it is done properly. Therefore, the various types and phases of inquiry are important for educators to understand, so that students are ready to face the dynamics of education in the 21st century.

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