International Journal of Teaching and Learning (INJOTEL) e-ISSN: 3025-8308
Vol. 2 No. 7, July 2024, pages: 2038~2048

# THE EFFECTIVENESS OF MULTIMEDIA-BASED INQUIRY LEARNING MODELS IN ELEMENTARY SCHOOL LEARNING

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**Abstract**

The Inquiry Learning Model is a problem-based learning or investigation carried out by searching for truth or knowledge that requires critical, creative thinking and the ability to use intuition. Inquiry learning is a learning pattern to help students learn to formulate problems and test their own opinions and have awareness of their abilities. Learning begins with posing a problem and question. Students are required to think logically, analytically and critically in searching for, investigating and finding answers to the problems in question. The effectiveness of the inquiry learning model cannot be separated from the active role of students in the learning process. The learning material is not provided directly, but the role of students in this model is to search and find the learning material themselves, while the teacher acts as a facilitator and guide for students to learn. There are five stages taken in carrying out inquiry learning, namely: a) formulating problems to be solved by students; b) determine a temporary answer or better known as a hypothesis or problem; c) look for information, data and facts needed to answer hypotheses or problems; d) draw conclusions or generalizations; and e) draw conclusions.

**Keywords:** Learning Models, Inquiry, Multimedia, Learning

## INTRODUCTION

Education plays a major role in the human resource development process. Improving the quality of education is a process that cannot be separated from the process of improving the quality of human resources themselves. Education is the main key to a nation's success in competing at the global level. The importance of education is a process of transferring existing information and values. As long as this process occurs, there will be changes in reasoning and attitudes toward better things (Lobemato et al.,

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2022). The goals of national education contained in Law no. 20 of 2003 is to develop the potential of students to become human beings who have faith and devotion to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent and become democratic and responsible citizens.

Students must actively compose, organize and carry out active thinking activities, actively formulate concepts and give meaning to the things being studied (Afrina et al., 2023). According to constructivism theory, students must be able to learn individually and in groups where students can work together to build their will, understanding and knowledge.

In integrated learning, students are expected to have the ability to identify, collect, assess and use information around them meaningfully (Thangjai & Worapun, 2022). However, the reality shows that the learning carried out by educators in the classroom does not reflect meaningful learning. This is shown by less varied learning, because the learning process tends to use the old learning model, namely the educator as the learning center (teacher center).

This causes learning activities to be less meaningful and students will tend to be more passive. Educators lack the ability to use appropriate media in the learning process. Educators also rarely carry out activities that allow students to carry out discovery activities such as practicums and learning based on daily life experiences.

One of the learning models recommended for learning in elementary schools is the inquiry learning model. In this case, the inquiry learning model is a learning model that is in accordance with the characteristics of the 2013 curriculum learning pattern, because this model places more emphasis on the learning process of discovering a concept so that a scientific attitude emerges in students. In this case, Prastowo (Maffira & Yurnetti, 2022) states that thematic learning offers learning models that make learning activities relevant and meaningful for students, both formal and informal activities, including active inquiry learning up to the absorption of knowledge and facts. passively, by empowering students' knowledge and experience to help them understand and make sense of their life world.

The Inquiry Learning Model is a problem-based learning or investigation carried out by searching for truth or knowledge that requires critical, creative thinking and the ability to use intuition. Inquiry learning is a learning pattern to help students learn to formulate problems and test their own opinions and have awareness of their abilities. Learning begins with

posing a problem and question. Students are required to think logically, analytically and critically in searching for, investigating and finding answers to the problems in question (Pirdaus, 2022).

According to Sanjaya (Irfan et al., 2023) inquiry learning is effective if a teacher expects students to be able to find the answer to a problem they want to solve for themselves, if the lesson material to be taught is not in the form of ready-made facts or concepts, but rather a necessary conclusion. proof, if the learning process starts from students' curiosity about something, if the teacher will teach to a group of students who on average have the will and ability to think, if the number of students learning is not too large so that it can be controlled by the teacher, if the teacher has sufficient time enough to use a student-centered approach.

Furthermore, Trianto (Susilawati et al., 2023) stated that inquiry is a core part of contextual-based learning activities. The knowledge and skills that students acquire are not expected to be the result of remembering a set of facts, but rather the result of discovering them for themselves. Teachers must design activities that refer to discovery activities, whatever the material they teach.

## RESEARCH METHOD

The study in this research is qualitative with literature. The literature study research method is a research approach that involves the analysis and synthesis of information from various literature sources that are relevant to a particular research topic. Documents taken from literature research are journals, books and references related to the discussion you want to research (Earley, M.A. 2014; Snyder, H. 2019).

## RESULT AND DISCUSSION

### Inquiry Learning Model

A. Understanding the Inquiry Learning Model

A fun learning model will make students enthusiastic about learning. Choosing the right learning model will have a big influence on the achievement of the teaching and learning process. A learning model is a plan or pattern that can be used to design a teaching mechanism that includes learning resources, learning subjects, learning environment and curriculum (Donham, 2022).

According to Trianto (Safitri, 2023) "Learning models are broad and comprehensive approaches and can be classified based on learning

objectives, sequence patterns, and the nature of the learning environment."

Based on the explanation above, it can be explained that a learning model is a plan or pattern that is used as a guide in planning learning that includes learning resources so that learning can be more meaningful.

Inquiry comes from English, namely inquiry, which means question, examination, or investigation. Inquiry literally means investigation. Carind & Sund (Jeon, 2023) state "inquiry is the process of investigating a problem" meaning that inquiry is the process of investigating a problem. Kuslan & Stone (Sari & Paidi, 2023) define inquiry as a teaching where teachers and students study scientific events with an approach to the soul of scientists, as defined by Piaget (Putri & Fakhriyana, 2023), namely:

The inquiry learning model is learning that prepares children to carry out their own experiments, in the broad sense of wanting to see what happens, wanting to use symbols and looking for answers to their own questions, connecting one discovery with another, comparing what other people have found. (Nisa & Astriani, 2022).

A collection of definitions of inquiry on the inquiry page (Wu, 2024) states: Inquiry is an approach to learning that involves a natural investigation process, which encourages students to ask questions, make discoveries by testing those discoveries through research in the search for a new understanding. Inquiry related to science education must reflect inquiry. Thus, the teaching and learning process through inquiry always involves students in discussion and experimental activities.

Based on several experiments above, it is clear that the inquiry model can be interpreted as a student-centered learning model, where students are encouraged to be directly involved in conducting experiments, collecting and analyzing data, drawing conclusions, discussing and communicating.

B. Objectives of the Inquiry Learning Model

In general, the inquiry learning model is a learning model that is related to a problem, conducting research and answering a problem. This learning model is often also called the heuristic learning model, which comes from the Greek, namely heuriskein, which means I find. The main goal of inquiry-oriented learning is to develop students' attitudes and skills, so that they can become independent problem solvers. In this way, students must be able to develop skeptical thinking about things and events in this world. In the opinion of Joice (Aras & Mahmud, 2022) in

saying: The general aim of this inquiry learning model is to help students develop the discipline and intellectual skills needed to raise problems and find their own answers through their curiosity.

Based on these two opinions, it can be concluded that the general aim of the inquiry learning model is to help students with the discipline and intellectual skills needed to raise problems and then be able to find the answers themselves so that they can become independent problem solvers.

**Inquiry Method Implementation Process**

In general, the learning process using the inquiry learning model can follow the following steps (Hongphanut, 2023):

a. Orientation

The orientation step is a step to foster a responsive learning atmosphere or climate. In this step, the teacher conditions students so that they are ready to carry out the learning process, the teacher stimulates and invites students to think about solving problems. The orientation step is an important step, the success of this model really depends on the students' willingness to use their abilities to solve problems. Some things that can be done during the orientation stage are:

1. Explain the topic, objectives and learning outcomes that students are expected to achieve
2. Explain the main activities carried out by students to achieve the goals.
3. Explain the importance of learning topics and activities.

b. Formulating the Problem

Formulating a problem is a step in bringing students to a problem that contains a puzzle. The problems presented are problems that challenge students to think about solving the puzzle. The puzzles that are a problem in inquiry are puzzles that contain clear concepts that must be sought and found. Several things that must be considered in formulating the problem include;

1. Problems should be formulated by students themselves.
2. The problem studied is a problem that contains a puzzle whose answer is certain.
3. The concepts in the problem are concepts that students already know.

c. Formulate a Hypothesis

A hypothesis is a temporary answer to a problem being studied. As a temporary answer, the hypothesis needs to be tested for truth. One way

for teachers to develop the ability to guess (hypothesize) in each child is by asking various questions that can encourage students to be able to formulate temporary answers or be able to formulate various estimates of possible answers to a problem being studied.

d. Collecting data

   Collecting data is the activity of gathering the information needed to test the proposed hypothesis. In this learning model, collecting data is a very important mental process in intellectual development. The task and role of the teacher at this stage is to ask questions that can encourage students to think about finding the information they need.

e. Testing Hypotheses

   Testing a hypothesis is the process of determining answers that are considered acceptable according to the data or information obtained based on data collection. The most important thing in testing a hypothesis is to find out the level of students' confidence in the answers given. Testing a hypothesis means developing the ability to think rationally. This means that the correctness of the answers given is not only based on arguments, but must be supported by data found and can be justified.

f. Formulating Conclusions

   Formulating conclusions is the process of describing findings obtained based on the results of hypothesis testing. Formulating conclusions is a gong in the learning process. To reach accurate conclusions, teachers should be able to show students which data is relevant.

**Inquiry Learning Model using Multimedia Devices**

In general, the learning process using the inquiry learning model can follow the following steps.

1. Orientation is a step to foster a responsive learning atmosphere or climate. In this step, the teacher conditions students so that they are ready to carry out the learning process. The orientation step is a very important step, the success of the inquiry learning model really depends on the student's ability to carry out activities using their abilities in solving problems.
2. Formulating a problem is a step in bringing students to a problem that contains a puzzle, a problem that challenges students to solve the puzzle, and students are encouraged to look for the right answer. The process of looking for answers is very important, through this process students will gain very valuable experience as mental development through the thinking process.

3. Proposing a hypothesis is a temporary answer to a problem being studied, the hypothesis needs to be tested for truth. One way that teachers can develop the ability to guess (hypothesize) in each child is by asking various questions that can encourage students to formulate temporary answers or formulate various estimates.
4. Collecting data is the activity of gathering the information needed to study the proposed hypothesis. In the inquiry learning model, collecting data is a mental process that is very important in intellectual development.
5. Testing a hypothesis is the process of determining answers that are considered acceptable according to the data or information obtained based on data collection. The most important thing in testing a hypothesis is to find out the student's level of confidence in the answer they give. Apart from that, testing hypotheses also means developing rational thinking skills.
6. Formulating conclusions is the process of describing findings obtained based on the results of hypothesis testing (Lee & Morris, 2023).

**Effectiveness of the Inquiry Learning Model in Improving Student Learning Outcomes**

The effectiveness of the inquiry learning model cannot be separated from the active role of students in the learning process. The learning material is not provided directly, but the role of students in this model is to search and find the learning material themselves, while the teacher acts as a facilitator and guide for students to learn (MacKinnon, 2023). There are five stages taken in carrying out inquiry learning, namely: a) formulating problems to be solved by students; b) determine a temporary answer or better known as a hypothesis or problem; c) look for information, data and facts needed to answer hypotheses or problems; d) draw conclusions or generalizations; and e) draw conclusions (Devi & Rajan, 2024). The inquiry learning model places students as subjects in the learning process so that students play a role in discovering the essence of the subject matter themselves through concrete experiences according to the objects they have seen in observations.

This experience provides insight and understanding that is difficult to convey through ordinary learning. Meanwhile, through discussion activities, students can discuss the results of observations and solve problems with their group friends. Discussion and presentation activities will create a conducive atmosphere, because studying with friends will make it easier to exchange opinions based on the experience gained from observations. The results of

this research are in accordance with the opinion of Sanjaya (Pradikto & Sofino, 2023) who states that the inquiry learning model is a series of learning activities that emphasize the thinking process of searching for and finding answers to a problem in question.

Apart from that, the results of this research are also supported by several studies, including research conducted by Kritianto (Sajitha & Priya, 2024), the research results show that the application of the inquiry learning model can improve critical thinking and student learning outcomes in fourth grade elementary school science learning. Research conducted by Arifuddin (Kondo et al., 2023), the results showed that there was a significant influence between the use of the inquiry learning model on students' mathematical problem solving abilities in fraction material in class IV MI Hidayatus Shibyan. Research conducted by Munandar (Saini et al., 2023), the results of the research show that inquiry learning through lesson study-based practicum is very effective in increasing students' mastery of the concept of the respiratory system and activities during the learning process.

The application of Inquiry Learning emphasizes that students are actively involved in the learning process (Lv et al., 2022). Active students can be directly observed from the way they discuss, actively ask questions and collect relevant information. So in implementing the Inquiry Learning model there are learning steps that must be achieved. The first step is simulation, the teacher starts by asking questions and asking students to read a phenomenon that contains problems. In the second step of the problem statement, students are given the opportunity to identify problems which will then be solved. The problem is then formulated in a hypothesis or question as a temporary answer. In the third step, data collection, students are given the opportunity to collect some relevant data or information, then read literature from various sources and observe an object with the aim of making students able to answer questions and confirm whether the hypothesis is true or not. In the fourth step of data processing, all information that has been obtained will be classified, tabulated and interpreted according to the problems that occur. The fifth step is verification, after the information obtained has been classified, tabulated and interpreted, then the questions or hypotheses formulated are checked again to prove the truth. The sixth step of generalization, based on the verification results obtained, students can draw conclusions about the problems or phenomena that occur (Bhowal et al., 2024).

## CONCLUSION

The Inquiry Learning Model is a problem-based learning or investigation carried out by searching for truth or knowledge that requires critical, creative thinking and the ability to use intuition. Inquiry learning is a learning pattern to help students learn to formulate problems and test their own opinions and have awareness of their abilities. Learning begins with posing a problem and question. The learning process using the inquiry learning model can follow steps, one of which is orientation, which is a step to foster a responsive learning atmosphere or climate. In this step, the teacher conditions students so that they are ready to carry out the learning process. The orientation step is a very important step, the success of the inquiry learning model really depends on the student's ability to carry out activities using their abilities in solving problems. The interactive multimedia developed is suitable for use to improve learning outcomes and train students' critical thinking skills.

## REFERENCES


Afrina, M., Siska, J., & Danim, S. (2023). Developing Android-Based Chemistry Learning Media Using the Inquiry Model to Improve Students' Learning Outcomes and Critical Thinking Ability. *Tadbir : Jurnal Studi Manajemen Pendidikan*, *7*(2), 409–409. https://doi.org/10.29240/jsmp.v7i2.8162

Aras, L., & Mahmud, R. (2022). COMPARISON OF THE PROBLEM BASED LEARNING (PBL) MODEL WITH THE DISCOVERY-INQUIRY FOR THE STUDENT MATHEMATICS LEARNING MODEL AT SMPN 3 SINJAI. *Daya Matematis: Jurnal Inovasi Pendidikan Matematika*, *10*(1). https://doi.org/10.26858/jdm.v10i1.7619

Bhowal, A., Neogy, S., & Naskar, R. (2024). Deep Learning-based forgery detection and localization for compressed images using a hybrid optimization model. *Multimedia Systems*, *30*(3). https://doi.org/10.1007/s00530-024-01336-6

Devi, P. S., & Rajan, A. S. (2024). An inquiry of image processing in agriculture to perceive the infirmity of plants using machine learning. *Multimedia Tools and Applications*, *Query date: 2024-07-04 20:41:50*. https://doi.org/10.1007/s11042-023-18052-4

Donham, J. (2022). 3 The Importance of an Inquiry Model in Teaching and Learning. *Global Action for School Libraries*, *Query date: 2024-07-04 20:36:53*, 35–47. https://doi.org/10.1515/9783110772586-005

Earley, M. A. (2014). A synthesis of the literature on research methods education. Teaching in Higher Education, 19(3), 242-253.

Hongphanut, R.-. (2023). *Development of Learning Community Through Virsual Inquiry Model with Historical Methods to Be Historical Innovators in*

*Digital Age*. *Query date: 2024-07-04 20:36:53*. https://doi.org/10.2139/ssrn.4532318

Irfan, I., Rokhmat, J., & Verawati, N. N. S. P. (2023). Development of Pictorial Riddle-Based Guided Inquiry Model Learning Devices to Improve Students' Problem Solving Ability. *Jurnal Penelitian Dan Pembelajaran Fisika Indonesia*, *5*(1). https://doi.org/10.29303/jppfi.v5i1.206

Jeon, O. (2023). A Study on the Development of Learning Model and Learning Types Based on Appreciative Inquiry 4D Process. *The Journal of Future Education*, *13*(2), 23–47. https://doi.org/10.26734/jfe.2023.13.02.02

Kondo, C., Mizokuchi, R., Yoneda, J., & Kodera, T. (2023). Construction of an Environment Model for Auto-tuning Quantum Dot Devices Using Model-based Reinforcement Learning. *Extended Abstracts of the 2023 International Conference on Solid State Devices and Materials*, *Query date: 2024-07-04 20:41:50*. https://doi.org/10.7567/ssdm.2023.b-1-03

Lee, N., & Morris, J. (2023). A Procedural Generation Platform to Create Randomized Gaming Maps using 2D Model and Machine Learning. *Signal Image Processing and Multimedia*, *Query date: 2024-07-04 20:41:50*. https://doi.org/10.5121/csit.2023.130916

Lobemato, M. N. R., Wardani, S., & Haryani, S. (2022). Design of Thematic Learning Devices Inquiry Model Multiple Intelligences-Based to Improve Cognitive Learning Outcomes of Elementary School Students. *International Journal of Research and Review*, *9*(12), 639–645. https://doi.org/10.52403/ijrr.20221273

Lv, Q., Zhang, S., & Wang, Y. (2022). Deep Learning Model of Image Classification Using Machine Learning. *Advances in Multimedia*, *2022*(Query date: 2024-07-04 20:41:50), 1–12. https://doi.org/10.1155/2022/3351256

MacKinnon, S. L. (2023). Adopting a Lifelong and Life-Wide Learning Mindset and Using Your Inquiry Skills beyond The Classroom. *Reigniting Curiosity and Inquiry in Higher Education*, *Query date: 2024-07-04 20:41:50*, 201–209. https://doi.org/10.4324/9781003446743-23

Maffira, R., & Yurnetti, -. (2022). DEVELOPMENT E-BOOK GUIDED INQUIRY MODEL PHYSICS INTEGRATING MULTIMEDIA FOR WAVE PROPAGATION, STATIONERY AND SOUND WAVE LEARNING MATERIALS. *PILLAR OF PHYSICS EDUCATION*, *15*(3), 228–228. https://doi.org/10.24036/11867171074

Nisa, C. C., & Astriani, D. (2022). Application of the guided inquiry learning model to increase student learning motivation. *Jurnal Pijar Mipa*, *17*(4), 475–479. https://doi.org/10.29303/jpm.v17i4.3664

Pirdaus, R. (2022). DEVELOPMENT OF MATHEMATICAL LEARNING DEVICES USING PROBLEM SOLVING STRATEGY IN STAD-TYPE COOPERATIVE LEARNING MODEL ON PYTHAGORAS THEOREM MATERIAL. *Jurnal*

*Prinsip Pendidikan Matematika*, *4*(2), 68–76. https://doi.org/10.33578/prinsip.v4i2.121

Pradikto, B., & Sofino, S. (2023). Application of the Flipped Classroom Model Using Games-Based Learning Multimedia in Increasing Students' Learning Outcomes. *JURNAL PAJAR (Pendidikan Dan Pengajaran)*, *7*(5), 1093–1093. https://doi.org/10.33578/pjr.v7i5.9449

Putri, Y. I., & Fakhriyana, D. (2023). Application of Discovery Learning and Inquiry Learning Model in Improving Students' Mathematical Literacy Skills. *Jurnal Pendidikan Matematika (Kudus)*, *6*(2), 145–145. https://doi.org/10.21043/jpmk.v6i2.22001

Safitri, E. (2023). A Comprehensive of the Guided Inquiry Learning Model in Education: A Review. *JOURNAL OF DIGITAL LEARNING AND DISTANCE EDUCATION*, *2*(7). https://doi.org/10.56778/jdlde.v2i7.268

Saini, A., Guleria, K., & Sharma, S. (2023). Deep Learning Based Model for Malaria Disease Detection Using Convolution Neural Network. *2023 International Conference on Network, Multimedia and Information Technology (NMITCON)*, *Query date: 2024-07-04 20:41:50*. https://doi.org/10.1109/nmitcon58196.2023.10276279

Sajitha, N., & Priya, S. P. (2024). Automated fabric defect detection using hybrid particle cat swarm optimizer with deep learning model. *Multimedia Tools and Applications*, *Query date: 2024-07-04 20:41:50*. https://doi.org/10.1007/s11042-024-18425-3

Sari, M. J. & Paidi. (2023). Analysis of Students' Learning Motivation Using Guided Inquiry Learning Model. *Jurnal Penelitian Pendidikan IPA*, *9*(8), 6265–6271. https://doi.org/10.29303/jppipa.v9i8.4366

Snyder, H. (2019¬). Literature review as a research methodology: An overview and guidelines. Journal of business research, 104, 333-339.

Susilawati, Doyan, A., Harjono, A., Artayasa, P., Soeprianto, H., & Hardiyansyah, A. (2023). Development of science learning devices using the assisted inquiry model as aid of real media to improve process skills and the mastery concept. *COMPUTATIONAL INTELLIGENCE AND NETWORK SECURITY*, *Query date: 2024-07-04 20:41:50*. https://doi.org/10.1063/5.0122552

Thangjai, N., & Worapun, W. (2022). Developing Inquiry Learning Characteristics of Grade 7 Students Using Integrated 5E's of Inquiry-Based Learning and Game-Based Learning. *Journal of Educational Issues*, *8*(1), 137–137. https://doi.org/10.5296/jei.v8i1.19547

Wu, H. (2024). Chinese university EFL learners' perceptions of a blended learning model featuring precision teaching. *Education Inquiry*, *Query date: 2024-07-04 20:36:53*, 1–19. https://doi.org/10.1080/20004508.2024.2361979