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# Inquiry Learning Improvement Helped Intuitively Media in Lesson V Private Professionals Schools

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**Abstract**--Inquiry is learning that involves maximally all students' abilities to the fullest. The purpose of this study is to investigate (1). Critical natural phenomena and living things (2). Logical analytical students who are creative and innovative in solving problems. (3). Multimedia inquiry learning for science lessons for fifth-grade elementary school. The research method uses an R&D, ADDIE, SDLC approach. The conclusion yields (a). Interactive multimedia design (b). Formation of competence of fifth-grade elementary school students. (c). Impact on increasing teacher productivity (d). Increasing student competence.

**Keywords**--inquiry learning, institutive media, professional schools.

## Introduction

Concurring to Muhamdijir Effendy, the instruction segment have to change the educational programs by including 5 understudy competencies is the 4.0 mechanical transformation period, to be specific: (1) having basic aptitude, (2) having imagination and imaginative capacities, (3) having capacity and communication aptitudes, (4) being able to corporate collaborate, (5) have self-certainty. According to [Lawrence \(2013\)](#), VUCA "Innovation causes our future to be: (volatile), (uncertain), (complex) and (ambiguous)". Some of the descriptions above indicate that inquiry learning is one of the lessons needed in developing critical thinking skills and is oriented to the learning process. Inquiry learning is a learning activity that involves maximally all students' abilities to search for and investigate a natural phenomenon, living thing, or object, systematically critically, analytically, and logically ([Milovanović et al., 2013](#)).

Learning Development is an effort to create learning variations that include objectives, indicators, materials, learning experiences (approaches, models, methods, strategies), evaluations, sources, and learning media, which are a series of development processes in producing learning. According to [Mulyasa \(2017\)](#),

there are 8 teacher skills in creating creative and fun learning, including 1) asking skills, 2) giving fortification, 3) conducting varieties, 4) clarifying, 5) opening and closing lessons, 6) directing little group discussion, 7) overseeing classes, and 8) teaching little bunches and individuals. In essence, science is seen in terms of product, processes and in terms of attitude development. This means learning science has a process dimension, a result dimension (product), and a scientific attitude development dimension. Science learning should be carried out scientifically to foster the ability to think, work, and behave scientifically and communicate as an important aspect of skills.

Science learning should be carried out scientifically to foster the ability to think, work and behave scientifically and communicate as an important aspect of life skills. According to Computer Research Technology (CRT): 1) Humans can remember 20% of what they see, 2) Humans can remember 30% of what they hear, 3) Humans can remember 50% of what is heard and seen, 4) Humans able to remember 70% of what he saw, heard and did. [Cheng et al. \(2009\)](#), Interactive Multimedia: is a medium that provides interactive learning in the form of 3D, sound, graphics, video, animation, and create interactions. The word interactive multimedia is a combination of two words, including interactive which has the meaning of inter-relationship, mutual action, and mutual activity, according to [\(Karsono et al., 2016\)](#). Education expert David Krathwohl asserts that the indicators for measuring higher thinking skills are analyzing, evaluating, and creating: 1) analyzing, namely: a) distinguishing, b) organizing, c) connecting; 2) evaluate, namely: a) checking, b) criticizing; 3) create; a) compose, b) plan, c) produce.

Multimedia development uses the SDLC approach which is referenced from [Rastogi \(2015\)](#), Software life cycle model whose scope of activities are: 1) Visualization Planning, 2) Necessities Investigation, 3) Software Modeling and Design, 4) Coding, 5) Documentation, 6) Testing, 7) Upkeep and Support. The use of the inquiry model will create more fun learning activities and ultimately affect the understanding of the concepts found. In principle, inquiry learning helps students to formulate questions, find answers or solve problems from their curiosity, and help with ideas about the world. Furthermore, it is said that inquiry learning aims to develop the level of thinking and thinking skills as well as critical thinking skills.

Based on the research of [Karlina et al. \(2018\)](#), the results of research on science lab inquiry learning are: 1) the characteristics of Inquiry Lab-based evaluation instruments to improve analytical skills, namely the evaluation instrument is part of the HOT which refers to the achievement of Inquiry Lab syntax indicators including observation, manipulation, generalization, verification and application; evaluation instrument according to Bloom's Taxonomy, especially on the ability to analyze (C4) with indicators of distinguishing, organizing and deconstructing; the form of the evaluation instrument is multiple choice using knowledge dimensions including factual, conceptual and procedural, 2) the feasibility of an Inquiry Lab-based evaluation instrument to improve the ability to analyze has a "good" level of content validity and construct validity; the validity of the items with a minimal interpretation of "enough"; the level of difficulty of the questions with the proportion of 60% moderate and 40% difficult; distinguishing power of questions

with a minimal interpretation of "enough"; the practicality of the "good" questions, 3) the results of the field test of the evaluation instrument are indicated by the average results of the students' ability to analyze the Inquiry Lab model class (79.36), which is higher than the existing learning class (64.75) and it can be concluded that the evaluation instrument based on The Inquiry Lab is declared effective and can be used as an evaluation tool in schools (Widiawati & Rati, 2021; Mardapi, 2018).

Research conducted by [Sukma \(2020\)](#), the conclusion of the research: 1) the development of learning tools through 4 stages: a) defining, b) design, c) development and d) dissemination, 2) Biology learning tools based on excretory system inquiry that was developed consisted of RPP, BPD, LKPD, and THB. The results of the validation and trial show that the learning tools meet the criteria of validity, practicality, and effectiveness. The results of research [Wulandari et al. \(2019\)](#), the results of the study stated that the t-count t-table showed that there were differences in learning outcomes between students who used interactive learning media based on guided inquiry learning models and students who used guided inquiry learning models and books ([Zuliana et al., 2014](#)). Thus, it can be concluded that the inquiry-based instruction learning model using interactive multimedia can support student activities in improving student learning outcomes. Research [Herlanti et al. \(2013\)](#), has the following objectives: 1) Produce inquiry-based interactive multimedia products in 5th-grade elementary science learning; 2) Produce interactive multimedia learning for science learning; 3) Produce interactive multimedia learning that can improve critical thinking; 4) Produce effective interactive multimedia learning for science learning.

## **Method**

The research and development (R&D) design use the Borg & Gall model, while the instructional design development uses the Dick & Carey model system approach. Dick & Carey's research method uses two studies, namely descriptive-qualitative research, and improvement-evaluative research ([Montiel-Overall & Grimes, 2013](#); [Anjewierden et al., 2011](#)). The descriptive method is used for initial research to collect objective data on science learning for Grade 5 Elementary School, then research and development settings are carried out (Research & Development), while the method used is improved research methods, research aimed at improving, improving or perfecting the situation. , activities or implementation of a program, based on previous research. Broadly speaking, the modifications of the two models are illustrated in.

Dick &amp; Carey Systems Approach Model

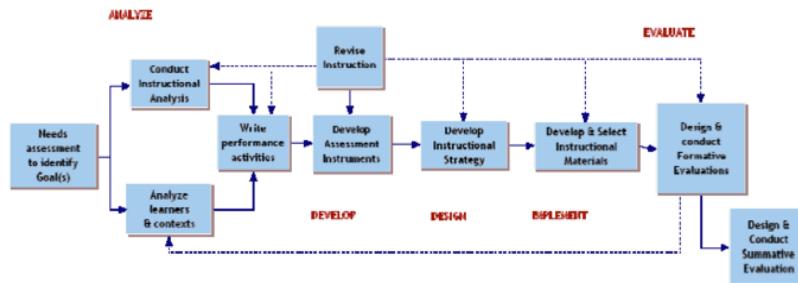


Figure 1. Instructional design development

Development steps: 1) Examination of needs and targets; 2) Conducting instructional analysis; 3) Learning and context analysis; 4) Defining execution targets; 5) Create disobediently; 6) Develop instructional strategies; 7) Create and select directions materials; 8) Designing and conducting formative evaluations; 9) Carry out instructional revisions; 10) Design and implement a summative evaluation. The investigation was conducted on 5th review science subject at Kayu Agung Elementary School, Capacity: Science has gotten by methodically finding out around nature, science isn't as it were the authority of gathering a collection of information within the frame of facts, concepts, or standards but moreover the method of revelation. Characteristics of inquiry-based learning: 1) Emphasizes the process of searching and finding 2) Knowledge is built by students through the search process, 3) The teacher's role as facilitator and mentor of students in learning, 4) Emphasizes critical and analytical thinking processes formulate conclusions (Katz & Dack, 2014; Balyer et al., 2015; Kumar et al., 2021).

## Results and Discussion

The results of the research and development are the science learning model for Class 5 SDN Kayu Agung based on inquiry, including 1) Development of a learning design model, 2) Curriculum design for fifth-grade elementary school in the second semester of 5th grade, 3) lesson plan for 5th-grade elementary school, 4) development of materials teaching magnetic force materials, simple planes and light in the form of books, modules, videos, and student worksheets "Lembar Kerja Peserta Didik- (LKPD)", 5) An interactive multimedia-based hybrid learning system.

### The results of development research include

#### Identifying learning needs

Identification of learning needs based on science teacher interviews through Google forms, among others: media procurement is government assistance in the form of KIT which is still incomplete; science media such as: animal anatomy, torso, Science Kit, Globe; the average number of media is 5 sets, some even have

only 1 set; the condition of the media is quite good and some of them are damaged, some practice teaching aids are minimal and some even don't have them; learning media are generally affixed to whiteboards and desks, learning preparation using lesson plans, LKPD, learning; demonstration and inquiry learning methods; the use of media is carried out independently, in groups and demonstrations; evaluation through the teacher by providing questions and practical work, the teacher involves and activates the media with appropriate independent and group assignments, and motivation (Merdekawati, 2015; Joyce et al., 2003). The way teachers involve and activate the use of media is by dividing group assignments, motivating students, doing assignments with computers through social media channels; manual for the use of science media, "Kurikulum -2013")K13 and LKPD books; the existence of media utilization, media arrangement based on established standards or laboratories; a place to store media in laboratories and classrooms; supervision of learning media from the principal by making rules, carried out regularly and supervised (Nworgu & Otum, 2013; Olibie, 2013).

The teacher's problems are the use of media in science learning: 1) lack of competence in using media, 2) lack of facilities and infrastructure, 3) lack of time allocation, while students' difficulties in using media: 1) installation and lack of understanding of tools, 2) media utilization has not been carried out yet. maximum. Positive student questionnaires: enjoy learning science, paying attention to the explanations given by the teacher, I need to succeed in this learning, science is how to ask and find answers about the physical universe, curiosity about the teacher's questions, do the assignments given by the teacher, students with groups discussing science material, the teacher is fun, smiling, the teacher uses learning methods and science learning techniques, it is not monotonous, the social and home environment supports science learning. The problems of teachers and students in the science learning process are suspected to have a negative impact on students' learning motivation. Learning is not yet effective, the material is instant, compared to providing imagination and creative power in understanding the material, so students are bored if they only read texts in science books at school, and students are not even invited to dialogue about how the concepts and knowledge of science learning are. Finally, it can have an impact that student learning achievement has not been maximized, students have been declared complete in science learning, but abilities (HOTS) such as: analysis, evaluation, and creation are not formed, students only can read, write and memorize (Konovalenko et al., 2021; Garcia & Roblin, 2008).

### **Perform instructional analysis**

Instructional analysis of science learning for class V semester 2 begins with an explanation that science is a process, the learning process must actively involve students in learning, assuming students are scientists, demands a scientific method, followed by force material consisting of magnetism, gravity, and friction, the next meeting plane with lever material, inclined plane, pulley, and axle wheel, the next meeting of light with material properties of light, work of modeling the nature of light, next is the material of the earth and the universe with matter: the structure of the earth, sun, water, and natural events.

### **Analyze the characteristics and context of learning**

The profiles are the students of SD Kayu Agung, the respondents are students of SD IPA grade 5 as many as 26 students, female gender: 38.46% and male: 61.54%, the average age of student respondents: 11 years; from Tangerang: 100%, source of funds: 100% from parents, place of residence with parents: 100%; occupation of parents of private employees: 40,60%, entrepreneur: 12,70%, self-employed: 21,90% and civil servants: 12,50%; The highest father's education is SMA: 71.90% and the mother's highest education is SMA: 59.40%, the average KKM score is 80.07. Science development experience: 1) observational learning; 2) project learning; 3) using media; 4) carry out live pharmacies, 5) others: e-learning, social media), while the experience that is not obtained is conducting laboratory experiments. Regarding the training activities 1) science learning models, 2) elementary science project training, 3) science learning media, 4) internet in supporting elementary science, while the training activities have not generally been LAB.IPA training for elementary school. Desire to have science ability to complete daily life (Jones et al., 2013; Bogler & Somech, 2004).

Cognitive abilities of students' problems in learning science: not agreeing that science is observation and measurement, observing objects around us, collecting facts and connecting facts to make interpretations and conclusions, lifelong learning skills that can be used to learn various sciences, and think logically and systematically. The effective ability of student problems: requires students to be active, confident ability, discussion ability (Sriarunrasmee et al., 2015; Löhner et al., 2012). In Psychomotor Ability students' problems: repairing damage, creating new tools that are more perfect, changing tools so that they are more efficient. In verbal information on student problems: the ability to interview users, able to communicate, understand the environment through communication. Observation of learning style dominates visual = 76.9%, auditory = 15.60% and kinesthetic = 9.40%. The ability of students' motivation to learn problems includes: science laboratory support (92.30%), having science books (27%), adequate library facilities (15.4%), supportive classroom conditions (7.7%).

### **Formulate specific learning objectives**

Formulation of specific instructional objectives for science learning: 1) Explaining science as a process, active, scientist and scientific method; 2) Magnet – Magnetic Force; 3) Gravity; 4) Friction; 5) Plane – Lever; 6) Tilts, Pulleys; 7) Spinning Wheel; 8) Light – The properties of the color of light and the color of light; 9) Works and models apply the nature of light; 10) Make light works; 11) Tool testing; 12) Earth and the universe – the earth and the sun; 13) Water – water function and water cycle; 14) Natural Events. The results of the instructional analysis are (attachment 3 RPP SD Class 5).

### **Develop assessment instruments**

Development of assessment instruments in science learning, evaluation is directed at critical thinking skills or HOTS (high order thinking skills), able to analyze, evaluate and create in 14 meetings whose question indicators are directed to HOTS, storytelling questions that lead to HOTS imagination questions,

level 3 and In the form of multiple questions, the materials used are 1) process, 2) magnetism, 3) magnetic properties, 4) type of magnet, 5) magnetic form, 6) plane (lever), 7) plane (tilted object), 8) plane (pulley), 9) rotating wheel, 10) light (the properties of light), 11) light (light colors), 12) light (create light model works), 13) light (test light modeling tools), 14) Earth (analyze the earth), 15) The sun (analyzes the sun), 16) Water (analyzes water), 17) Water cycle (analyzes the water cycle), 18) Tin Landslide (analyzes the occurrence of landslides), 19) Floods (analyzes the occurrence of floods), 20) Tsunami (analyzes the occurrence of tsunamis).

### **Develop learning strategies**

Science learning strategies for class V semester 2 with the HOTS approach, namely: a) initial activities: apperception, pre-test; b) core activities where students and teachers during the learning process use an inquiry learning approach, which consists of: final activity: strengthening, post-test, conclusion. The next activity is to present the subject matter, it can be in the form of: presenting concept maps, presenting, presenting videos, case studies, and simulations. Provide assistance and tutoring to students according to the characteristics of students obtained by the teacher, efforts to excite students to improve performance, and achievements carried out during learning activities. Formative assessment is pursued based on the meeting module ([Wahyudi & Supardi, 2013; Yuniyanti et al., 2012](#)). Finally, students are directed to analyze, synthesize and create to live in the real world. The right strategy in learning science class V is learning by doing. In this learning, students are actively involved in observing the concept of science (inquiry learning).

### **Develop learning materials**

In developing teaching materials, the developer chooses learning materials, material questions, and discussion materials to support science learning for fifth-grade elementary school. Various teaching materials that will be used for learning needs include: 1) Textbooks, 2) Science eBooks, 3) teacher and student manuals, 4) Learning Materials, 5) Presentation materials, 6) Simulations, 7) Video animations, 8 ) Student conferences with Zoom, Google Meet and Microsoft Teams, 9) links to Science Learning Management System learning sites.

### **Design and develop formative evaluation**

Formative evaluation is a design process to obtain data that can be used to review learning designs to be more efficient and effective. The first stage of Formative Evaluation is to conduct an evaluation consisting of: Evaluation of Material Experts, Evaluation of Learner Design Experts, Evaluation of Media Design Experts, and Evaluation of Information Technology Experts, through interviews and questionnaires. Furthermore, the one to one evaluation, small group discussion, field trial, is described in the following chart:

- The evaluation of material experts regarding this science learning model is: Science learning materials are presented according to their field of knowledge, the latest in the science field can be seen links to various media

on the Internet, the material is following the expected competencies, has up-to-date literature and allows hyperlinks to other science learning media, already following the needs of science, with the support of learning Inquiry science learning will build a complete 5th-grade graduate, science learning builds affective abilities such as: respecting and involving yourself in science learning.

- The design expert's evaluation of his learning program stated:
  - Learning design through a curriculum analysis process, instructional analysis of drafting plans based on a fifth-grade elementary science learning competency map, which consists of: subject competencies: a) fostering high b) mastering knowledge, c) having skills or ability to apply knowledge in the context of scientific investigation, problem-solving and making creative works and the use of information technology.
  - The design of learning in the ICT aspect is to build a positive, critical, creative, innovative, collaborative, and honest attitude, understand the surrounding natural phenomena, understand the principles of science, produce decisions based on the scientific method through a process of in-depth observation.
  - The learning design has taken into account the content and instructional objectives from general to specific inquiry-based science learning.
  - The learning design has carried out formative evaluations: expert evaluations, trials, while summative evaluations to see the level of students' abilities in one semester have not been carried out.
  - Overall the learning design already has good quality.
- The evaluation of science learning media experts on learning programs include:
  - Learning media are practical and easy to learn, use and access, and can be used without going through the training process.
  - The suitability of cognitive aspects in planning: curriculum, lesson plans, syllabus, assessment instruments, and rubrics.
  - Affective aspect suitability: willing to work, cooperative, appreciative, willing to share learning and communication, while psychomotor abilities are shown in some practice in assignments.
  - The suitability of professional aspects links to national geographics, popular science, science daily, science & technology stalls, and astronomical information
  - The material aspect is following the material needs based on the use of learning resource media and has modules that are suitable for learning needs.
- Evaluation of Information Technology experts on his learning program evaluates as follows:
  - Learning has adjusted to user needs through hybrid learning and Interactive Learning CDs and support for increasing science competence for class V SD. Learning has adapted to global design needs with the Moodle approach packaged in an interactive learning CD.

- The development of learning directed to prototype design can be seen in the steps of design development, namely: planning, design analysis, prototype design, building, evaluation, and testing and implementation.
- Learning development has carried out subject analysis when identifying learning objectives, has gone through material expert evaluation, evaluation of study experts, and system development design.
- Learning is done by coding, which is packaged in the <https://jokodewanto.my.id> application.
- Learning does not need training because it is very easy and user-friendly and learning through the system trial process.

- eProduct Test Evaluation Analysis (One to One Evaluation)

Revise the learning program using one to one product test evaluation, evaluation, or individual test by conducting a questionnaire to 3 smart students in class V SD, some notes in the product test evaluation or one to one evaluation, with the need to revise: use of learning time, to improve learning including: accuracy of concepts, definitions, and facts, up-to-date library, encouraging student curiosity, relevant to industry needs and using summaries.

- Analysis of Model Trial Evaluation (Small Group Discussion Evaluation)

The trial evaluation of the small group discussion evaluation model was carried out by 4 groups of students, where there were 5 people in each group. In the small discussion group test, the following are tested: efficiency and effectiveness: rational time completion, all components support student success in learning; implementation: learning products are easy to use by teachers and students, the target time for learning, teachers and students use the potential of free time, the potential for the time used and the potential for the suitability of learning; material: interesting learning, material supports students to learn, learning design: learning strategies attract students' interest.

- Field Test Evaluation Analysis (Field Test Evaluation).

Revising the learning program using a field test evaluation carried out on 26 students. In the field test, all the statements above agree on: learning is relevant to the needs of daily life, the impact on competence, providing satisfaction, and acquiring skills.

Table 1  
Interpretation of the interpretation of paired sample statistics test results

| No | No.Induk        | NISM       | Nama | Nilai Pre Test | Nilai PostTest |
|----|-----------------|------------|------|----------------|----------------|
| 1  | 2015.2016.1.067 | 0086261667 | SN   | 73,33          | 83,33          |
| 2  | 2015.2016.1.070 | 0088096831 | ANS  | 73,33          | 83,33          |
| 3  | 2015.2016.1.072 | 0094987877 | ASS  | 76,67          | 90             |
| 4  | 2015.2016.1.074 | 0092426338 | DO   | 70             | 76,67          |
| 5  | 2015.2016.1.075 | 0095891049 | DAA  | 73,33          | 83,33          |
| 6  | 2015.2016.1.077 | 0083278822 | DF   | 70             | 80             |
| 7  | 2015.2016.1.079 | 0086786034 | FA   | 70             | 80             |
| 8  | 2015.2016.1.080 | 0096935069 | GH   | 70             | 80             |
| 9  | 2015.2016.1.081 | 0087935643 | GG   | 76,67          | 90             |

|    |                 |            |       |       |       |
|----|-----------------|------------|-------|-------|-------|
| 10 | 2015.2016.1.083 | 0091578551 | J     | 73,33 | 76,67 |
| 11 | 2015.2016.1.085 | 0096034569 | LN    | 76,67 | 90    |
| 12 | 2015.2016.1.086 | 0094445048 | LZ    | 73,33 | 90    |
| 13 | 2015.2016.1.087 | 0091457850 | MAA   | 73,33 | 76,67 |
| 14 | 2015.2016.1.088 | 0099960061 | MA    | 73,33 | 76,67 |
| 15 | 2015.2016.1.089 | 0091335240 | MEW   | 76,67 | 83,33 |
| 16 | 2015.2016.1.091 | 0093618421 | MFR   | 73,33 | 80    |
| 17 | 2015.2016.1.092 | 0087664731 | MN    | 73,33 | 76,67 |
| 18 | 2015.2016.1.093 | 0096513299 | MRS   | 73,33 | 83,33 |
| 19 | 2015.2016.1.095 | 0098711850 | MFA   | 73,33 | 83,33 |
| 20 | 2015.2016.1.096 | 0097035906 | MA    | 73,33 | 76,67 |
| 21 | 2015.2016.1.097 | 0091567248 | RA    | 70    | 76,67 |
| 22 | 2015.2016.1.099 | 0065318360 | SNR   | 70    | 86,67 |
| 23 | 2015.2016.1.100 | 0088473132 | SA    | 66,67 | 73,33 |
| 24 | 2015.2016.1.102 | 0097706833 | TR    | 73,33 | 76,67 |
| 25 | 2016.2017.2.084 | 0096829785 | SEA   | 73,33 | 76,67 |
| 26 | 2018.2019.4.126 | 0097191719 | MAFPP | 70    | 76,67 |

- PreTest and PostTest Assessment

Pre-Test and Post-Test assessments were carried out on 26 students

Tabel 2  
Table paired samples statistics

| Measurement    | Mean    | N  | Std. Deviation | Std. Error Mean |
|----------------|---------|----|----------------|-----------------|
| Pair 1 PreTest | 72.6912 | 26 | 2.49791        | .48988          |
| PostTest       | 81.0262 | 26 | 5.05578        | .99152          |

From the results of the Paired Sample Statistics analysis, the PreTest average value (mean) of learning outcomes is 72.69, while PostTest the average value (mean) of learning outcomes is 81.03. The number of respondents there are 26 students. Standard deviation of PreTest = 2,498 and PostTest = 5,056. Standard Error Mean PresTest = 0.489 and PostTest = 0.991.

Table 3  
Paired samples correlations

| Measurement               | N  | Correlation | Sig. |
|---------------------------|----|-------------|------|
| Pair 1 PreTest & PostTest | 26 | .582        | .002 |

The output above between PreTest and PostTest, based on the correlation value of 0.582, states the strength of the relationship is moderate and the Significant value is  $0.002 < 0.05$ . This indicates that inquiry-based interactive multimedia learning in science lessons for 5th grade elementary school children at Kayu Agung Elementary School variable before PreTest and after PostTest learning can be accepted.

Tabel 4  
Table paired samples test

| Measurement | Paired Differences |                |            |   |           |        | t | df | Sig.<br>(2-tailed) |  |  |  |
|-------------|--------------------|----------------|------------|---|-----------|--------|---|----|--------------------|--|--|--|
|             | Mean               | Std. Deviation | Std. Error | 95% Confidence Interval of the Difference |           |        |   |    |                    |  |  |  |
|             | n                  | Mean           | Lower      | Upper                                     |           |        |   |    |                    |  |  |  |
| Pair1       | PreTest            | -              | 4.13436    | .81081                                    | -10.00490 | -      | - | 25 | .000               |  |  |  |
|             | PostTest           | 8.33500        |            |   | 6.66510   | 10.280 |   |    |                    |  |  |  |

The mean value is -0.8335. This value shows the difference between the average PreTest learning outcomes and the PostTest learning outcomes average = 72.69 - 81.02 = - 0.8335 and the difference is between the values of -10.0049 and - 6.6651 (95% Confidence Interval of the Difference). Based on the Paired Sample Test table, the t-count value is  $-10.280 > 1.697$  t-table, so as the basis for the decision above,  $H_0$  is rejected and  $H_a$  is accepted. So it can be said that there is a difference in the average value of PreTest and PostTest, which means that the effect of using Inquiry-based interactive science learning multimedia for science subjects increases the learning outcomes of fifth-graders at Kayu Agung Elementary School in 2020. Improvement of Operational Products of the Inquiry-Based Learning Development Model was revised according to the results of operational trials and input from users of the web-based Inquiry-Based Learning system application ([Suharta & Luthan, 2013](#); [Suyanti, 2010](#)).

### **Revise the learning program**

Recommendations for improving the science subjects of SD Kayu Agung to be effective and efficient through formative evaluation in step 8 are concluded as follows:

- Identification of learning objectives: increasing the ability of teachers to support learning, improving learning by identifying internal, external and learning problems, preparing general learning competency standards
- Instructional Analysis: Identifying science learning as a process, active, scientist and scientific method
- Student learning is carried out more face-to-face, exercises and assignments to provide assessments, students are improved in their creativity, activeness, confidence, communication and discussion skills with the support of varied tasks, student priorities 76.90 like visuals, learning motivation, ownership of books Science in the library, and science laboratories.
- Formulating specific instructional objectives: Identifying science learning as a process, active, scientist and the scientific method, magnet - magnetic force, gravity, friction, plane - lever, tilted object pulley, spinning wheel, light - properties of light and color of light, work - models apply the nature of light, create works of light, the earth, and the universe and the sun
- Develop assessment instruments with the support of question indicators, level and form of questions

- Develop learning strategies Development of classroom science learning strategies with the HOTS approach include: 1) initial activities, 2) core activities of inquiry learning, 3) final activities, 4) presentation of subjects with interactive multimedia, 5) providing assistance and student learning guidance, 6) students are asked to produce something with the HOTS approach, namely: analyzing, synthesizing and creating.
- Develop and select teaching materials: e-book learning media support, video animation, learning simulations, study conferences (zoom, google meet, and Microsoft team)

The revision of the fifth grade science learning program at SD Kayu Agung is a process of developing learning programs to obtain data that can be used to review learning designs to be more efficient and effective (Marsita et al., 2010; Muchtar & Silaban, 2013). The emphasis of informative evaluation is on the collection and analysis and revision of the design. The results of the learning design are as follows: <https://jokodewanto.my.id>

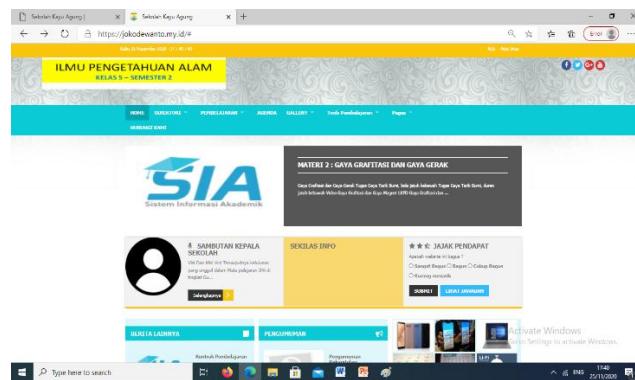


Figure 2. Learning product application / <https://jokodewanto.my.id>  
(Source: 2021 Premier Data)

## Conclusion

Based on the explanation of the objectives and results obtained in the research on the development of interactive multimedia in science learning with an inquiry approach in improving critical thinking, it can be concluded:

- The learning model is carried out through several stages, the analysis is based on an analysis of general competency objectives, instructional analysis, and analysis of student characteristics. At the development stage, it is carried out based on formulating performance goals, developing instruments, developing instructional strategies, and developing teaching materials, while holding evaluation is carried out formative evaluations including expert tests, material tests, design expert tests, information technology tests, individual trials, small group tests, and tests. try the field, which eventually produces learning products on the <https://jokodewanto.my.id> application.
- Interactive multimedia for inquiry learning is a learning tool or facility that contains materials, methods, limitations, and evaluations that are designed

systematically and attractively so that students are willing to make observations, to attract the competencies/sub-competencies of the expected subjects according to their complexity.

- Inquiry-based Interactive Multimedia Learning Model supports learning locations for both students and teachers anywhere, the accuracy of starting learning during a pandemic, learning suitability in terms of student visual intelligence is 76.9%, all learning components, both: curriculum, learning program lines, lesson plans, books, teaching materials, LKPD, questions for each meeting, videos, animations, and media support without internet limits, media content: email, discussion groups, online media, e-books, links to national geographics, popular science, science daily, science & technology stalls and astronomical info. Assisted information for lecturers and students, lecturer administration interrelationships, support for access locations, media feasibility, all of which support the effectiveness of science learning for fifth-grade elementary school.
- Development of learning outcomes in terms of materials, methods, evaluations is directed to the taxonomy: analysis, evaluation, and creation which is the support for HOTS learning, as well as support for inquiry learning. The results of interactive multimedia learning can be informed, the results of the validation: 1) in the one to one evaluation indicate strongly agree at: 79.570% and strongly agree at: 13.978%, 2) in the small group discussion evaluation indicate strongly agree at: 11.956%, very agree at: 19.565%, agree at: 54.357%, 3) in the field test evaluation shows strongly agree at: 69.23% and strongly agree: 27.85%, 4) pretest results: 72.69 and posttest: 81.03. The results of the test validation showed very good results and the results of the pretest and posttest also increased, so it can be concluded that interactive multimedia learning can improve the critical thinking skills of fifth-graders at SD Kayu Agung.

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