ANALYSIS OF THE USE OF VARIATION OF MEDIA IN INQUIRY LEARNING AND LEARNING STYLES ON PHYSICS LEARNING OUTCOMES IN CLASS X HIGH SCHOOL

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Abstract

Technology and media have always been an integral part of many strategies. Comparative studies over the years have shown that it is learning strategies that facilitate learning, not technology and media. The purpose of this study was to analyze the interaction of the use of various media in inquiry learning and learning styles on physics learning outcomes. This study used a quasi-experimental design with a factorial design (3x3) which involved three groups of subjects, taking into account the existence of a moderator variable which was thought to influence the experiment on the results obtained. Research data were collected using: (1) a visual-auditorial-kinesthetic learning style questionnaire; (2) pre-test and post-test learning outcomes. The three research hypotheses were tested using a two-way analysis of variance (ANAVA) technique. All statistical analyzes used the SPSS statistical program and all null hypothesis testing was performed at the 5% significance level. The results showed that there was an interaction between the use of various media in inquiry learning and learning styles towards the physics learning outcomes of class X high school students.

Keywords*: variety of media, inquiry learning, learning styles, physics learning outcomes*

1. INTRODUCTION

Studies on the quality of learning are always related to the use of optimal learning methods to achieve learning objectives under certain learning conditions (Degeng, 2001). This means, to achieve high quality learning, subjects must be organized with the right organizational strategy and delivered to students with the right delivery strategy.

The strategy for delivering learning content as designed in this study is a way of solving learning problems experienced by students, especially in understanding physics concepts. The problem that arises is related to the lack of understanding of the concepts of physics that are taught to students, resulting in low physics learning outcomes achieved by these students. This occurs as a result of the absence of a learning delivery strategy that prescribes three components, including: (1) learning media; (2) student interaction with the media; and (3) the form of teaching and learning (Degeng, 1989). To overcome these learning problems, it is necessary to study the strategies for delivering content and materials needed by students that can help facilitate student learning.

The discipline of learning technology science based on the definition of the Association of Educational Communications and Technology (AECT, 2004), emphasizes study and ethical practice in an effort to facilitate learning and improve performance by creating, using or utilizing, and managing processes and appropriate technological resources. So, the main goal is still to facilitate learning to be effective, efficient and interesting as well as improve performance. The learning designed in this study is intended as a way to solve problems related to the use of integrated media in learning strategies in the classroom.

Technology can help learners implement learning strategies more effectively. Information explosion requires that learners can plan and organize learning environments to ensure that learners are challenged and successful (Kuhn & Udell, 2001). Learning strategies chosen by students affect student learning outcomes. Therefore, learners must be selective about the choices made. Basic theory and research on learning shows that learners act as guides to enhance learning (Marzano, et al., 2001). As a guide, the learner is responsible for ensuring that the strategies used work effectively in helping to achieve the expected learning outcomes.

The digital revolution is fueling a rethinking of teaching and learning methods. Druker (1999) in the 2004 Ministry of National Education Strategic Plan, a leading management expert stated that "a nation that can really take advantage of the explosion of digital communication, and connect it with new learning techniques, will undoubtedly lead the world in the field of education". Various studies on the impact of learning media have been carried out by researchers, including researchers who specifically examine the negative effects of media. From various studies it turns out that there are more positive impacts, so that the use of technology and media can improve the quality of learning and learning in the classroom.

The quality of learning requires various efforts to make it happen. These efforts are related to the various components involved in learning in the classroom, one of which is the use of learning media. The results of research by Felton, et al., (2001), show that the use of media in the learning process can significantly increase the achievement of learning outcomes. This adds to the importance of conducting studies and research related to the integration of technology and media in learning strategies in physics learning.

There are five perspectives that can be seen regarding technology in its role as a learning medium (Clark, 1994), namely: (1) media as technology; (2) the media as a tutor or learner; (3) the media as a socialization agent; (4) media as a motivator for learning, and (5) media as a mental tool for thinking and solving problems. Meanwhile, Winn (1996), added that, there are three roles of media in learning, namely: (1) functions as a conveyer of special messages; (2) as forming an intermediary environment, where the media helps students explore and form an understanding of a knowledge, and (3) the development of cognitive abilities, where the media is used as a model or expansion of mental abilities. In this study, media is used as a mental tool for thinking;

Thus, the use of technology and media in the classroom can be a powerful tool for helping learners achieve a variety of cognitive goals. Technology and media can also help students learn facts, understand abstractions, and achieve goals at a higher cognitive taxonomy level (Roblyer, 2006). In addition, technology offers a tool to facilitate practice and learn facts.

The main trend in the development of media and technology is the merging of several media or called multimedia. Heinich, et al. (1996) divides multimedia into: (1) multimedia kits; (2) hypermedia; (3) interactive media, and (4) virtual reality. This study focuses on interactive media, namely media that asks students to practice a skill and receive feedback. Computer-based interactive media creates a multimedia learning environment with a system for presenting lessons with visuals, sound and video material presented under computer control, so that students can not only hear and see images and sound but also give an active response.

As a learning medium, educational messages in both cognitive, affective, and psychomotor aspects can be packaged in the form of interactive media. Learning by using interactive media is more interesting because there are learning media in the form of animation, movies (video slides), and programmed sounds. The advantage of this interactive media is that several text media, audio, graphics, still images and all moving images can be combined in one easy-to-use system. This is in line with one of the main tasks of the learning technology discipline, namely facilitating the learning process at all levels, and where the learning process occurs through appropriate learning resources.

Computer-based media as a learning resource can be integrated with various learning strategies. According to Roblyer (2006), multimedia technology or computer software in general can be integrated with both objectivistic (direct instruction) and constructivist (inquiry-based learning) based learning. The integration of multimedia technology with learning using an inquiry approach in science learning has the potential to increase understanding (Turkmen, 2006; So & Kong, 2007), and several previous research findings conclude that inquiry-based learning with hands-on practice is not optimal in increasing understanding of concepts (Baser, 2006; Ketelhut, et al., 2009).

With regard to the above, technology and media have become an integral part of many strategies. Comparative studies over the years have shown that, what facilitates learning are learning strategies not technology and media (Smaldino, 2008). The opinion that there is no media influence on learning lasted quite a long time and was discussed by many people (Clark, 1983). However, the results of recent research reveal different facts, namely the media influences learning processes and outcomes (Asyhar, 2011).

Strategy as a learning procedure is chosen to help students achieve their goals or internalize content. According to Smaldino, et al. (2008), integrate technology and media formats in classroom learning by using the ASSURE model (Analyse learners; State objectives; Select instructional methods, media and materials; Utilize media and materials; Require learner participation; Evaluate and revise) for lesson planning. This model can assist students in systematically planning the use of effective technology and media that can enhance learning so that learning is more meaningful.

Meaningful learning occurs when learning methods are based on the nature of learning. The principles of learning must depart from the principles of people learning. Degeng (2000), argues that the packaging of learning today is often based on assumptions that are not in line with the nature of learning, the nature of the people who learn, and the nature of those who teach. The lack of understanding of the nature of learning has an impact on the management of learning, which is the nature of forwarding information, and it often even declines in reporting the contents of books (Raka Joni, 2008). The paradigm of forwarding information which only involves low-level thinking skills encourages students to learn rote. This is a learning weakness that emphasizes products and ignores processes, even though understanding products, especially science (physics),

The above is in line with the constructivist paradigm which states that, the involvement of learners in meaningful experiences is the essence of empirical learning, such as activities from passive transfer of information to problem solving and active discovery. Constructivists emphasize that students create their own interpretations of the world of information. The role of learning is to provide students with ways to organize knowledge, not to share facts (Smaldino, et al., 2008). Constructivist experts believe that learning takes place effectively when students are involved in authentic tasks that link meaningful contexts, namely learning by doing (learning by doing). Thus, the constructivist learning environment prioritizes and facilitates the active role of learners,

Physics is a branch of Natural Sciences (IPA) that is built based on observation and data classification, and is usually compiled and verified in quantitative laws that involve the application of mathematical reasoning and analysis of natural phenomena (Yuliati, 2008). Thus, in essence physics is the science of natural phenomena as outlined in the form of facts, concepts, principles and laws that have been verified through a series of activities in the scientific method.

Based on the explanation above, physics has characteristics including, physics studies natural laws (matter and energy), physics develops through experimentation and physics includes products, processes and attitudes. While the characteristics of learning physics, including facts about physics are considered difficult and are not liked by students so that the average value of physics tends to be low. This is due to the many abstract concepts of physics, the terms of physics that are used are different from everyday terms, the need for mathematical abilities to understand physics, learning physics is not interesting and not contextual, laboratory facilities are inadequate and the physics material being taught is too Lots.

Learning that is in accordance with the characteristics of physics subjects and which can bridge laboratory limitations is the integration of technology and media with inquiry learning strategies. Inquiry is a learning strategy that uses students' active thinking in problem solving. In this case the learner engages the learner to identify problems, define problems, solve problems and make decisions (Callahan et al., 1992). This is in line with what was stated by Piaget (in Sund & Trowbridge, 1973), that inquiry strategy is learning that prepares situations for students to conduct their own experiments; in a broad sense, seeing what is happening, wanting to do something, wanting to use symbols and looking for answers to one's own questions, connecting one discovery with another discovery, comparing what was found with what was found by others. Stone (in Dahar, 1991), defines inquiry strategies as learning in which students study events and scientific phenomena with the approach and spirit of scientists.

Trowbridge, et al. (1990), states that the inquiry strategy is a learning process of investigating problems, formulating hypotheses, designing experiments, finding data, and describing the conclusions of these problems. students by providing sufficient guidance and discovering scientific concepts and principles.

Inquiry learning strategies are a series of learning activities that emphasize critical and analytical thinking processes to seek and find answers to a problem in question (Choi, et al., 2008). The nature of science as a product as well as a process encourages the use of an inquiry approach in science learning (National Research Council, 2002). The essence of inquiry is questions and investigations that are scenario to explore students' initial ideas which are then used as a reference for building understanding. Thus, learning using an inquiry approach is very appropriate for conceptual change which is a form of conceptual learning according to constructivism.

In line with the above, Permendiknas 41 of 2007 has set process standards to encourage the use of an inquiry approach in learning physics. Process standards provide a minimum reference for learning which consists of three phases, namely exploration, elaboration, and confirmation. Learning in the standard context of the educational process is not just conveying subject matter, but is interpreted as a process of regulating the environment so that students learn according to their abilities and potential.

The inquiry learning strategy in this study was chosen to be applied to the research subject group by integrating the use of media variations with computer-based inquiry strategies. The lesson presentation system is carried out with visuals, sound, video material, LKS material, textbooks and is presented through computer control so that students can not only hear, see pictures and sound, but also give an active response (two-way communication), by loading the steps learning as follows: (1) orientation, (2) formulating problems, (3) formulating hypotheses, (4) collecting data, (5) testing hypotheses, and (6) formulating conclusions (Sanjaya, 2010).

The general obstacles that students convey in managing science learning using an inquiry approach (Lawson, 2000, Levitt, 2002, National Research Council, 2002), namely: (1) students are reluctant to change the method they have been doing for years and are believed to be effective; (2) science lessons are seen as too advanced not in accordance with the daily experiences of students; (3) students are reluctant to read books or learning resources using an inquiry approach; (4) the required tools and materials are too expensive; (5) it takes a long time; (6) large learning energy is needed; (7) discussions are often widened, not focused, and many students don't like it; and (8) difficulties in managing learning.

Chinn & Silver (2002) put forward several advantages of using computer-based media in learning using an inquiry approach, namely: (1) experimentation can be faster; (2) experimental designs can be more complex; and (3) more focused on the theoretical aspect. By using a computer, the activities and experimental results (real and simulated phenomena) can be controlled for accuracy by the designer so that they are in accordance with the theory. Besides that, the ease in designing conceptual visualizations, both static and dynamic, makes computer-based media superior for supporting theoretical aspects.

Based on the description above, it can be explained that the main problem (as the dependent variable) in this experimental research is motivated by the low results of learning physics in high school. The low learning outcomes indicate that the level of mastery of students on physics concepts is still low, this is allegedly due to problems in the learning process. What is worrying is that these low learning outcomes (below the Minimum Completeness Standards or SKM) are then changed in value to equal to or above the SKM, referring to the SKM that has been set (minimum value of 75). This situation further adds to the importance of this research, because according to Degeng (1997), improving the quality of learning is not only based on rational studies, but also empirical studies.

Based on empirical studies (Setiawan, 2011), several factors were found which were suspected of causing low physics learning outcomes, including: (1) physics concepts taught by students were still abstract in nature and too difficult for students to understand; (2) learning physics is not interesting and laboratory facilities are inadequate. Besides that, it can be added that (3) learning materials are seen by students as too theoretical, not giving contextual examples. The delivery method is monotonous, not making optimal use of various media (Ministry of National Education, 2004). The same thing was reported by William, et al. (2003) in the Journal of Physics Education that middle school students do not like physics because the way physics is delivered is less interesting and there are lots of formulas.

The physics learning practices observed by the researchers in the preliminary research in February 2011 showed several trends that led to the intent of this research. For example, when observing learning in class X SMA, the learning pattern has not changed much, it is still "teacher centered" and one-way communication still dominates the atmosphere of learning activities in class. The method applied by students is still carried out in a conventional way, namely teaching with text media, occasionally using presentation media via PowerPoint directly under the leadership of the learner as the conveyer of learning material, if there is time a debriefing and practice questions are held. According to Druxes (1995), in the process of learning physics should be accompanied by experiments by students in front of the class, and by students in the laboratory with practicum. It turns out that this method is burdensome for students in situations where the facilities in the laboratory are limited so that the learning process becomes less meaningful.

The results of a study by the Jember Regency physics MGMP forum (Suyanto, 2010), found that: (1) 85% of high school physics learning was carried out using lecture methods and exercises assisted by LKS; (2) 65% of students manage learning with verbal delivery patterns; (3) 87% of students directly adopt the order of subject matter according to the book used; (4) 30% of physics students never do practicum; and (5) only a few students stated that they had used technology and media. The data above shows that the inquiry approach is very lacking in physics learning and the neglect of the use of technology and media in learning.

Based on the observations of researchers in the implementation of learning in the classroom, learning using interactive media oriented to inquiry approaches is no longer often ignored by teachers, but almost all teachers in the learning process rarely use media in the form of interactive media, so that many students experience boredom, difficulties and confusion. in understanding the subject matter. Student textbooks are even the main resource in the teaching and learning process, even students cannot teach without these textbooks. Therefore, the material taught and the methods used by students in conveying learning content are heavily influenced by textbooks (Callahan, 1992). This can be used as a prediction as one of the reasons students cannot get good learning outcomes.

The purpose of learning is to help students develop their intellectual abilities so as to enable them to develop in the ability to think and investigate or inquiry. Developing the ability to think and investigate or inquiry aims to develop critical thinking habits (Jarolimek, et al., 2005). The ability to investigate or inquiry includes the ability to use intellectual power and skills. This ability is a means to control real problems that occur in the surrounding environment in students' daily lives. According to Setyosari (2003), if students do not have the ability to do inquiry, it will cause problems for the students themselves, especially in learning. The problem is in the form of difficulty understanding the information or concepts being studied,

Through learning by integrating technology and media that are oriented towards an inquiry approach in conveying the material presented, it will be able to help make it easier for students to understand the subject matter of learning, because material can be studied repeatedly well, independently or in groups. In addition, learning innovation efforts cannot ignore one important aspect, namely the characteristics of the learner. Technology and media can accommodate learning to meet the diverse needs of different learners (Eggen & Kauchak, 2004).

Many studies report that learning styles play an important role in the effectiveness of learning strategies and learning resources used. The application of a learning innovation can be effective for certain learning style characteristics, but sometimes it 'hurts' learning for students with other learning styles. This study focuses on learning styles related to preferences & physical modalities, namely: visual, auditory, kinesthetics. Learning styles based on this categorization have a direct connection with the design of messages from learning materials.

The influence of learning styles on learning processes and outcomes has been demonstrated in various studies (Waras, 2003; Kirna, 2010). Basically, it is known that, children learn according to their learning styles and each learning style affects their learning outcomes. If a child encounters a learning environment that does not suit his or her learning style, the learner will reject the learning environment (Kolb, 1984; Robotham, 1999). Thus, it can be said that learning styles affect learning outcomes.

The reasons as described above have led the researcher to a conclusion that the physics learning outcomes achieved by students are still low. The low learning outcomes are thought to be due to the inaccurate learning content delivery strategy used. The use of technology and media in learning that integrates the study of social knowledge, physics and inquiry-oriented mathematical logic (inquiry) is possible to provide superiority and contribute to the learning outcomes of physics. In addition, characteristic factors, in this case the learning styles of students, are also thought to have an influence on the acquisition of physics learning outcomes.

It is also unfortunate that studies and research relating to the integration of technology and media in inquiry learning and learning styles in high school physics subjects in Jember Regency have not been carried out much. For this reason, it is necessary to conduct research to test whether there is an effect of using a variety of media in inquiry learning and learning styles on physics learning outcomes in class X SMA.

2. MATERIALS AND METHODS

The purpose of this study was to analyse the interaction of the use of various media in inquiry learning and learning styles on physics learning outcomes. Furthermore, to test the use of these media variations, it is carried out using an experimental research design.

In this study, using a factorial design (3 x 3) by paying attention to the existence of a moderator variable which is thought to influence the experimental results. In this type of design, the selection of research groups was carried out randomly, and prior to conducting experiments on the three treatment groups, a pre-test was carried out first to measure the initial state of the three subject groups. After the treatment, tests were carried out on the subject group. Thus, the experimental procedure consists of pre-test, treatment and post-test.

The factorial design divides the subject groups based on the number of types of treatment and the types of groups to be studied. The factorial design (3 x 3) in this study can be seen in Figure 3.1.

O_1	X_1	Y_1	O_2
O_3	X_1	Y_2	O_4
O_5	X_1	Y_3	O_6
O_7	X_2	Y_1	O_8
O_9	X_2	Y_2	O_{10}
O_{11}	X_2	Y_3	O_{12}
O_{13}	X_3	Y_1	O_{14}
O_{15}	X_3	Y_2	O_{16}
O_{17}	X_3	Y_3	O_{18}

Figure 3.1 Factorial Design (3 x 3) with Three Whole Groups and Moderator Variables (Adaptation from Tuckman, 1999)

Picture description 3.1
Treatment (X)
X1 = Interactive Media
X2 = Media Presentation
X3 = Media Textbook
Moderator (Y)
Y1 = Visual Learning Style
Y2 = Auditory Learning Style
Y3 = Kinesthetics Learning Style
O1, O3, …O2n-1 = Observation of pre-test results
O2, O4, …O2n = Observation of post-test results

The experimental design pattern as shown in Table 3.1 provides a clearer picture of the influence of the treatment variables in this study.

Table 3.1 3 x 3 Factorial Experiment Design Pattern

			Media Variation		
			Interactive Media	Presentation Media	Media Text book
			1	2	3
Learning Style	Visual	1	Y1.1.1, Y1.1.2, …Y1.1.n	Y1.2.1, Y1.2.2, …Y1.2.n	Y1.3.1, Y1.3.2, …Y1.3.n
	Auditory	2	Y2.1.1, Y2.1.2, …Y2.1.n	Y2.2.1, Y2.2.2, …Y2.2.n	Y2.2.1, Y2.3.2, …Y2.3.n
	Kinesthetic	3	Y3.1.1, Y3.1.2, …Y3.1.n	Y3.2.1, Y3.2.2, …Y3.2.n	Y3.3.1, Y3.3.2, …Y3.3.n

Through the factorial design pattern as presented in Table 3.1 it is possible to determine the main effect (main effect) and interaction effect (interaction effect) of all treatment variables. By using this design, the main effect and interaction effect of each treatment variable can be shown easily and clearly, according to what is stated in the research hypothesis. The main effect of the treatment variables is divided into two types: (1) the main effect of the media variation variable in inquiry learning is different regardless of the effect of the learning style variable; (2) the main effect of the learning style variable is different regardless of the influence of the variable media variation in inquiry learning.

3. RESULTS AND DISCUSSIONS

Description of Research Results

The description of the research results provides a description of: (1) the condition of the research subjects, and (2) the learning outcomes.

Description of Research Subjects

The number of Jember 2 Public High School students who were the subjects of the study were 114 people, consisting of 66 girls and 48 boys. The results of the descriptive analysis of the distribution of the number of students in the treatment group are presented in Table 4.1.

Table 4.1 Distribution of Research Subjects Based on Treatment Groups and Learning Styles

Learning Style	Media Variation			Amount
	Media Interactive (Class X.9)	Presentation Media (Class X.6)	Media Textbook (Class X.3)	
Visual	17	17	16	**50**
Auditory	9	12	9	**30**
Kinesthetic	12	9	13	**34**
Amount	**38**	**38**	**38**	**114**

Table 4.1 shows that, the distribution of students is evenly distributed in each group of media variations, but less evenly distributed in the learning style group. The number of students who have a visual learning style is greater than students who have auditory and kinaesthetic learning styles. The distribution of the number of students in cells is also uneven, but the number in each cell is greater than 20 students. This number meets the recommended criteria for a 3 x 3 factorial analysis (Santoso, 2002). In terms of gender, the distribution of students in each cell is quite varied as shown in Table 4.2.

Table 4.2 Distribution of Research Subjects by Gender

Gaya Belajar	Variasi Media									Jumlah
	Media Interaktif			Media Presentasi			Media Buku Teks			
	L	P	Jumlah	L	P	Jumlah	L	P	Jumlah	
Visual	5	12	**17**	5	12	**17**	7	9	**16**	**50**
Auditori	5	4	**9**	5	7	**12**	3	6	**9**	**30**
Kinestetik	6	6	**12**	6	3	**9**	6	7	**13**	**34**
Jumlah	**16**	**22**	**38**	**16**	**22**	**38**	**16**	**22**	**38**	**114**

2. Description of Learning Outcomes

The research data is the value of physics learning outcomes for class X high school students, obtained through a multiple-choice objective form test with a number of options five, which is carried out before and after the physics learning process, on the subject of dynamics of motion in accordance with the research treatment, namely by using a variety of media in inquiry learning and learning styles. In this study, learning outcomes were grouped according to the use of media variations, namely interactive media groups, presentation media groups and textbook media groups and according to learner learning styles, namely visual groups, auditory groups and kinesthetics groups.

The test result data is in the form of a score, then converted into a value based on the benchmark reference assessment (PAP). The criterion referenced test is an assessment that converts scores into values based on the maximum reference score. In this reference, scores are interpreted based on the achievement of certain goals (Grounlund and Linn, 1990). The formula used to calculate the value is: Value = (score obtained divided by the maximum score) x scale. Example score obtained = 25, maximum score = 33, then value = (25/33) x 100 = 76.

A more detailed description of learning outcomes describes descriptions of: (1) pre-test results, and (2) post-test results.

a. Description of Pretest Results

Based on the research implementation process, data that can be processed and analyzed is data in the form of pre-test and post-test results. Pre-test data is used to obtain an initial description of the research subject. In addition, this pre-test score data is also used to determine the homogeneity of the variance of the subject groups involved in this study.

Data on the value of physics learning outcomes before learning (pretest) in each treatment group, namely the use of various media (interactive media, presentation media, and textbook media) in inquiry learning, is attached in Appendix 9. Descriptive analysis of the value of physics learning outcomes before learning (pre-test) in each cell is presented in Table 4.3.

Table 4.3 State of Pretest Scores of Learning Outcomes in Each Treatment Group

Descriptive Statistics

Dependent Variable:HASIL BELAJAR PASCATES

Variasi Media	Gaya Belajar	Mean	Std. Deviation	N
Media Interaktif	Visual	85.18	8.777	17
	Auditori	78.67	10.863	9
	Kinestetik	73.00	9.045	12
	Total	**79.79**	**10.571**	**38**
Media Presentasi	Visual	77.06	11.172	17
	Auditori	76.25	7.933	12
	Kinestetik	70.67	7.906	9
	Total	**75.29**	**9.650**	**38**
Media Buku Teks	Visual	70.38	12.192	16
	Auditori	65.44	14.090	9
	Kinestetik	73.92	8.431	13
	Total	**70.42**	**11.687**	**38**
Total	Visual	77.68	12.185	50
	Auditori	73.73	11.945	30
	Kinestetik	72.74	8.368	34
	Total	**75.17**	**11.250**	**114**

Table 4.3 shows that the highest average value in the media variation group is the group of students who use textbook media in inquiry learning, while the highest average value in the learning style group is the visual learner group. In general, the standard deviation of the pre-test scores for each treatment group, both the media variation group and the learning style group, has a narrow range indicating no outlier data. The results of the boxplot test confirm that there is no data on pre-test scores on learning outcomes that are outliers, both in the media variation group and the learning style group. Boxplot image of pre-test scores on learning outcomes for groups of media variations and learning style groups.

The two-way ANAVA test was carried out to confirm the equality of the treatment groups with media variations in inquiry learning and learning styles. The results of the two-way ANOVA test on pre-test learning outcomes showed that there was no significant difference between the treatment groups, both the media variation group and the learning style group. Thus, the research subjects in each treatment group were equivalent in terms of the pre-test scores of learning outcomes. The complete results of the variance homogeneity test, and the two-way Anava between treatment groups of media variations and learning styles are listed in.

b. Posttest Results Description

After completing the treatment, the research subject groups were given posttests. The final test was carried out at the next meeting or one week after giving the treatment. The final test was held on December 10 2011. The processing time for the final test was the same as the initial test, which was 90 minutes. The model questions given during the final test were randomized again with the intention that students did not recognize the question numbers given during the initial test.

The post-test data is used to verify the use of media variations from the three different treatments. Data on the value of learning outcomes after learning (posttest) in each treatment group, namely the use of media variations (interactive media, presentation media, and textbook media) in inquiry learning, is attached in Appendix 9. Descriptive analysis of the value of learning outcomes after learning (posttest) in each cell is presented in Table 4.4.

Table 4.4 State of Posttest Scores of Learning Outcomes in each Treatment Group

Descriptive Statistics				
Dependent Variable:HASIL BELAJAR PASCATES				
Variasi Media	Gaya Belajar	Mean	Std. Deviation	N
Media Interaktif	Visual	85.18	8.777	17
	Auditori	78.67	10.863	9
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	Kinestetik	72.74	8.368	34
	Total	**75.17**	**11.250**	**114**

In Table 4.4 it is shown that the average value of the learning outcomes of students who have a visual learning style looks higher than those who have an auditory and kinesthetic learning style, namely 77.68 respectively; 73.73 and 72.74. Whereas for the media variation group, the use of interactive media and presentation media, the average learning outcomes of students who have a visual learning style are seen to be higher than those who have auditory and kinesthetic learning styles. However, in the media variation group, the use of textbook media showed that the average learning outcomes of students with kinesthetic learning styles were higher than those with visual and auditory learning styles. Students who have a visual learning style look superior in inquiry learning using interactive media,

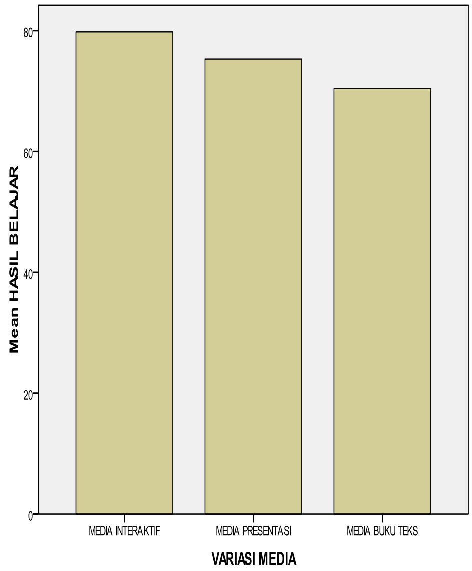

Figure 4.1 The average posttest score of the learning outcomes of the Media Variation Group

Based on Figure 4.1 it can be seen more clearly that the average post-test score of learning outcomes between groups of students who use interactive media in inquiry learning is higher than the group of students who use presentation media and textbook media in inquiry learning. A clearer picture is observed in table 4.2, that the group of students who have a visual learning style has an average value of learning outcomes higher than the group of students who have auditory and kinesthetic learning styles.

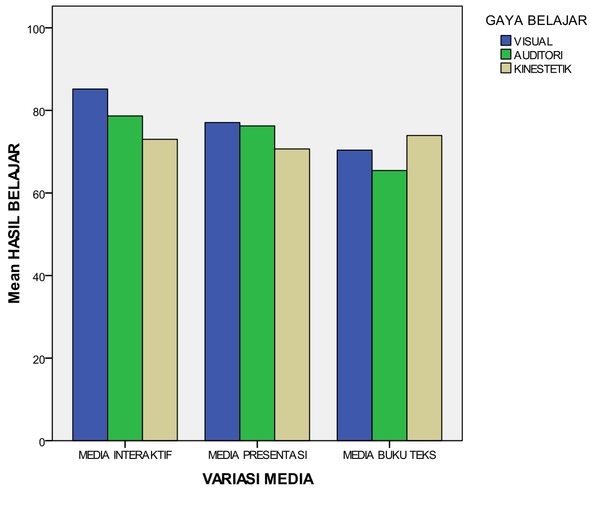

Figure 4.2 The average posttest score of learning outcomes in each group of media variations and learning styles

Based on Figure 4.2 it can be seen clearly that, in the media variation group in inquiry learning, the average post-test learning outcomes of students who have a visual learning style are higher than those who have auditory and kinesthetic learning styles. However, in the group of media variations in inquiry learning, students who have kinesthetic learning styles have an average learning outcome higher than students who have visual and auditory learning styles.

B. Assumption Testing

This section describes the assumption test, which includes: (1) normality test; and (2) homogeneity test.

Assumption testing is carried out to determine parametric feasibility before testing the research hypothesis. In accordance with the research design, all hypotheses were carried out using two-way analysis of variance.

The data normality test for each treatment group used the Kolmogorov-Smirnov statistical test, and the variance homogeneity test used the Levene's Test method. All assumption tests use a significance level of 5%. After the requirements for the normality and homogeneity tests were met, a hypothesis test was then carried out, namely testing the main effects and interactions between research variables.

a. Normality test

The normality test aims to determine the normality or symmetry of the distribution of post-test scores as the unit of analysis. The decision-making method for the normality test is carried out using the Kolmogorov-Smirnov Z method, that is, if the significance (Asymp.sig) > 0.05, the data is normally distributed.

Table 4.5 Normality Test Results using the One Sample Kolmogorov-Smirnov Z Method

One-Sample Kolmogorov-Smirnov Test							
		Media Interaktif	Media Presentasi	Media Buku Teks	Visual	Auditori	Kinestetik
N		38	38	38	50	30	34
Normal Parameters[a,b]	*Mean*	79.79	75.29	70.42	77.68	73.73	72.74
	Std. Deviation	10.571	9.650	11.687	12.185	11.945	8.368
Most Extreme Differences	*Absolute*	.114	.121	.079	.109	.158	.158
	Positive	.114	.121	.067	.109	.158	.158
	Negative	-.097	-.069	-.079	-.103	-.111	-.097
Kolmogorov-Smirnov Z		.701	.744	.484	.772	.866	.919
Asymp. Sig. (2-tailed)		.710	.638	.973	.590	.442	.368

a. *Test distribution is Normal.*

b. *Calculated from data.*

The results of the One-Sample Kolmogorov-Smirnov Test on the post-test scores of learning outcomes show the value of Asymp.Sig. (2-tailed) all treatment groups are greater than 0.05, namely: (1) Asymp.Sig price. (2-tailed) media variation group; the group using interactive media was 0.710, the group using presentation media was 0.638, and the group using textbook media was 0.973; and (2) Asymp.Sig prices. (2-tailed) learning style group; the group of students with a visual learning style is 0.590, the group of students with an auditory learning style is 0.442 and the group of students with a kinesthetic learning style is 0.368. This means that the value of learning outcomes in all treatment groups is normally distributed or the assumption of normality is met.

b. Variant Homogeneity Test

The second requirement that must be fulfilled in the statistical analysis of variance is the homogeneity test. The homogeneity test aims to determine whether the post-test variance values of individual learning outcomes are homogeneous between treatment groups. The variance homogeneity test uses the Levene's Test statistic, namely to assess the similarity of the variants of different subject groups.

The results of the inter-group variance homogeneity test on the post-test learning outcomes data are shown in Table 4.6.

Table 4.6 Results of the Homogeneity of Variance Test with the Levene's Test Method

Levene's Test of Equality of Error Variances[a]

Dependent Variable: PASCATES HASIL BELAJAR

F	*df1*	*df2*	*Sig.*
1.292	8	105	.256

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. *Design: Intercept* + Variasi_Media + Gaya_Belajar + Variasi_Media* Gaya_Belajar

In Table 4.6 it can be seen that the significance value of the dependent variable in post-test learning outcomes is 0.256 or greater than 0.05. This means that the assumption of homogeneity of variance is fulfilled and it can be concluded that the data group of learning outcomes between students who are taught with a variety of media in inquiry learning and learning styles have the same variance.

4. CONCLUSIONS

Based on testing the research hypothesis, it can be concluded that there is an interaction between the use of various media in inquiry learning and learning styles on learning outcomes, meaning that there are differences in learning outcomes, from the interaction between the use of media variations in inquiry learning and learning styles.

The use of interactive media in the inquiry learning strategy shows significant results in improving the physics learning outcomes of class X SMA. However, research findings report that the effectiveness of using this technology in terms of learning outcomes is still inconsistent. The suitability of media characteristics with content is one aspect that still needs to be studied. Thus, the study of the use of interactive media for learning in other fields of science really needs to be done

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