Multimedia Use and Learning Styles on Learning Achievement in Social Studies

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Abstract

The research aimed to find out the effect of the use of multimedia and the students learning styles on the students' achievement in social studies. The data were collected through surveys conducted at SMP Negeri 13 Mataram (public junior high school) for three months. The research involved 108 participants, systematically selected from the target population of 240 students. The data were collected through learning achievement test and then statistically analyzed using ANOVA. Research reveals that the use of multimedia effectively improved students' learning achievement in both visual and auditory learning styles. On the other hand, the use of conventional media did not show any significant effect on the students' achievement in both visual and auditory learning styles. The research findings suggest the teachers pay more attention to the use of multimedia in their classroom and take into account the students' learning styles.

Contents

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1. Introduction

Every child is endowed with different characteristics and brain capacities in absorbing, processing, and conveying information; thus, they are different in learning capacity. Learning constitutes mental activities that involve brain capacity in processing information. Learning is not merely memorizing facts but also processing different types of information and using them for varying purposes. In order for the learners to retain the information stored in their memory, they have to process and understand it well. The way they learn is influenced by both internal and external factors such as their learning styles and media they use to help them learn.

One of the learners' characteristics that relate to information processing is their learning styles. Learners with visual learning style learn very quickly by seeing others doing something or looking at how things are processed. These learners like systematic ways of providing information but dislike writing what teachers say or instruct. Contrast to this type of learners, auditory learners rely heavily on their hearing ability, while kinesthetic learners prefer direct involvement in a particular activity.

This research aimed at exploring the different learning achievements on social studies between students with visual learning style and those with auditory style related to the use of multimedia in the classrooms.

2. Research Method

This research used the quantitative method. It was conducted at SMP Negeri 13 Mataram from October 2016 to December 2016. Participants consisted of 224 students at grade eighth with visual learning type; 30 students were taken for instrument test. Research sample taken using random sampling technique consisted of 108 students, divided into two groups with an equal number, namely experimental group, and controlling group. While students in the experimental group were provided with multimedia, the students in the controlling group were treated with conventional media.

Data for the research were collected using an instrument of learning test and a questionnaire about learning styles. Data were then analyzed using both descriptive and inferential statistics. Inferential statistics were used for an analysis related to data normality, homogeneity, and multivariate statistics. Hypothesis testing in this research was conducted through F-test continued with *post-hoc* or Tukey-Test.

Theory

Related to different styles of learners, Siberman (2014) reports that in every 30 students, 22 of them can learn effectively during which the teacher presents an activity that combines visual, auditory, and kinesthetic senses. The rest of the children prefer one of those three styles, and as a result, they struggle to learn the lesson, which is not well structured to support learner's particular style.

Teachers and scholars have paid great attention to the children hereditary condition with varying characteristics. The hereditary background is believed to have an impact on the child's ability to hear, see, and move physically; thus, it contributes to the child's ability to learn. The availability of proper media can attract learners' attention, trigger their intake capacity, and strengthen their capacity to store information in their memory.

Research by Lim, Zhao, Thonder, and Thai (2013) showed that the adaptation of technological application at school is influenced and constrained by a number of factors including the condition of technological resources, school culture, experience and readiness of teachers and students in using technology, and the dynamics of social interactions within the school system.

In accordance with the aforementioned research, Sanisah (2013) reported that teachers in Mataram City often face difficulties in selecting and using learning media, appropriate methods and strategies, discussing particular teaching materials, and delivering methods that mostly attract the students. Consequently, they face difficulties in creating active, innovative, creative, educative, joyful, delightful, and quality learning. In her research on the use of media by 100 social studies teachers in Mataram, Sanisah reported that (1) 55% of the teachers use media in their teaching, (2) 23% of teachers have made a medium (teachers made media), (3) 97% make use of media available at school (ready-made media), (4) 12% teachers use video and television (audio-visual media), and (5) 9% teachers use computer and LCD projector (Sanisah, 2013, pp. 33-39).

Similarly, preliminary research conducted by one of our team in a number of junior secondary schools in Mataram shows a similar result. Social studies teachers are frequently encountered with barriers in delivering lessons and selecting media. As a subject matter, social studies are considered more complex as they comprise of sub-subjects including history, geography, and economics. This situation requires the teachers to have a comprehensive understanding of the subject matter as well as its composing elements. Considering the width and complexity of the materials taught in this subject matter, teachers are demanded to use attractive media or multimedia to avoid students' feeling of boredom.

Multimedia are products of the advancement in digital technology. These media are able to provide rich learning experiences for their users. Multimedia can present messages and knowledge in the forms of text, audio, graphics, video, and animation in a simultaneous manner. With this feature, multimedia can present extremely comprehensive information that the students need to learn.

The use of multimedia as a teaching aid can be modified according to the need and ability of the students as the users. Today, multimedia-based learning program has been integrated with the use of a computer, allowing the multimedia program to be used as an interactive program. There are a lot of strategies and methods that can be employed to design and produce a multimedia program that is effective for interactive learning media. The interactive feature of this type of media allows for more dialogic learning processes.

3. Results and Analysis

This experimental research with 2 x 2 design used two-factor analysis of variance (ANOVA). The following table presents a summary of the results.

Table 1
A summary of two-factor ANOVA with equal cells

Source	SS	dF	MS	F-cal	F-tab	Solution
Learning Media (A)	172,79	1	172,79	9,06	3,94	Reject H0
Learning Styles (B)	253,72	1	253,72	13,31	3,94	Reject H0
Interaction (AxB)	83,25	1	83,25	4,37	3,94	Reject H0
Error	1982,52	104	19,06	-	-	-
Total	2492,29	107	-	-	-	-

With reference to the above table (Table 1), average testing criteria, and interaction, some conclusions can be drawn as follow:

Reject H0 on Learning Media (A)

Research reveals a difference in the effect of learning media on the group of students with multimedia and a group of students treated with conventional media on students' learning achievement. In other words, learning achievement of students treated with multimedia differs from ones with conventional media.

Reject H0 on Learning Style (B)

Research reveals different effects on learning style between auditory students and students with visual style. In other words learning style has an effect on the difference in students' achievement.

Accept H0 on Interaction (AB)

It was revealed that there is an interaction between learning media and learning styles towards learning achievement. It means that the characteristics of style difference in every learning medium are different. It also means that the difference in learning achievement resulted from each of the learning media is inconsistent with each learning style. Moreover, the different learning achievement from each learning style is inconsistent in each of the media. Therefore, the result has to be further tested using a *post-hoc* test.
Post-hoc test in this research uses Tukey-test for the number of data between cells is equal. Results of Tukey-test conducted are presented in the table below.

Table 2
A summary of Tukey-test

Source	N	Q count	Q Table	Solution
Multimedia	27	5,738	2,902	H0 rejected
Conventional	27	1,558	2,902	H0 accepted
Visual	27	5,100	2,902	H0 rejected
Auditory	27	0,921	2,902	H0 accepted

There is a difference in learning achievement in Social Studies between students with visual learning style and ones with auditory

The experimental research conducted at SMP Negeri 13 Mataram that explored the difference in learning achievement in Social Studies between students with visual learning style and those with auditory one shows a significant result. This result parallels the result of data analysis for the second hypothesis. It shows the average learning achievement of students with visual style is higher than the average of achievement of students with auditory style. The result of data analysis reveals that learning achievement of students with visual style is $F_{Calculator}$ 13.31 > 3.94 value F_{Table} at the degree of freedom 0.05. It is apparent that the average achievement of students with visual style is 37.20, which is higher than the average of achievement of students with auditory style, which is 34.13.

This result parallels with some theories that students' hereditary condition with naturally different learning styles provides opportunities for optimal achievement as long as it is optimally used and managed. DePorter (2002) argue that one's learning style function as a key to develop work performance at school and in interpersonal relationships. Although different researchers use different terms to refer to the difference in learning styles and how to deal with it, they have arguably agreed upon how to absorb information easily (modality) and how to manage and process the information (brain dominance).

Further, if learners are aware of their own learning style, they can help themselves to learn more quickly and easily. Levie (2005), based on their annotations of research findings on learning through graphic stimuli, verbal and visual, conclude that visual stimuli yield better results for tasks such as remembering, identifying, recalling, and associating facts and concepts. Baugh (2005), have a similar view in this regard. They reported that the acquisition of learning achievement through sighting and through hearing shows a very significant difference. About 90% one's learning outcome is obtained through visual sense, 5% through auditory sense, and the remaining 5% through kinesthetic sense. Meanwhile, Dale (2005), estimated that learning happens through visual sense comprises of about 75%, through auditory sense about 13%, and through other senses including kinesthetic about 12%. This indicates that students' learning styles are different from one another, resulting in their different potentials to absorb information. To conclude, differences in learning styles result in different learning achievements.

Implication

As the result shows the application of multimedia results in different achievements of the students with visual and those with auditory style. This finding has an implication to the ways teachers make a decision about making use of multimedia in the classroom and to the way school manages to provide multimedia that support students learning at SMP Negeri 13 Mataram. The application of multimedia, which should be the choice for teachers in the current digital era, also needs to consider learning styles as another variance. This hereditary condition should be considered in order to create effective and efficient learning processes at school. This finding is supposed to have an impact on widening teachers' insights into educational management by making generalizations about the impacts of research variables in line with theories verified in the variant analyses.

In sum, the research findings have some implications to the side of teachers on how important for them to understand the variance of their students learning styles. The more detail the teachers have knowledge about the characteristics of their learners, the more easily they may provide treatments accordingly. The school tradition to provide an intelligence test at the beginning of the school year should provide adequate data related to students' learning styles.

The teachers' difficulties in delivering social studies lessons in integrated manners will continue to occur unless the teachers utilize multimedia in their teachings. At least the teachers should use innovative strategies and media in order to attract students' interest in learning social studies at school. Considering the complexity of social studies as an integrated course, the teachers are required to have a comprehensive understanding of the subject matter along with its composing elements.

4. Conclusion

Based on the research findings and discussion it can be concluded that there is a difference in the achievement of Social Studies between students with visual style and those with auditory style. It means that learning style contributes to learning achievement as a result of students, different ability in understanding the lesson or subject matter.

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Biography of Author

ARSYAD ABD GANI was born in Sila, Bima, Indonesia Province of West Nusa Tenggara on August 10, 1958. He is the fifth son of nine brothers from Abd Gani Hasan and Siti Mahani. He graduated from government-run Islamic elementary school (*Madrasah Ibtidaiyah Negeri [MIN]*) of Sila in 1971; Muhammadiyah junior high school (*Sekolah Menengah Pertama [SMP]* Muhammadiyah) of Sila in 1974; and Muhammadiyah teacher training high school (*Sekolah Pendidikan Guru [SPG]* Muhammadiyah] of Bima in 1977. He went to college at Mataram Institute of Teacher Training and Education (*Institute Keguruan dan Ilmu Pendidikan [IKIP]* of Mataram) majoring in curriculum and educational technology and graduated with a bachelor degree (*Doctorandus*) in 1988. Then, he managed to pursue a master degree at *Universitas Adibuana PGRI* of Surabaya majoring in learning technology and graduated with a master degree of education (*Magister Pendidikan [M.Pd.]*) in 2007. He is currently doing his doctoral degree at State University of Jakarta (*Universitas Negeri Jakarta*) focusing on the program of educational technology. Arsyad began his professional career as an elementary school teacher in Pujut District, Central Lombok on March 1, 1978. He held this profession until 1997 when he was elected a parliamentary member of Mataram City (*Dewan Perwakilan Daerah [DPRD] Kota Mataram*). He served as a kindergarten/elementary school supervisor in West Lombok District of Kediri between 1999 and 2001. Before he continued his professional career as a lecturer at Muhammadiyah University of Mataram, he had served as a bureaucrat in a number of government agencies, including Mataram City Department of Education and Culture between 2001 and 2003; special staff to the Governor of West Nusa Tenggara Province between 2003 and 2004; Head of West Nusa Tenggara Bureau of Public Welfare between 2008 and 2012; and Head of West Nusa Tenggara Body of Library and Archives between 2012 and 2014. During his tenure both as professional and bureaucrat, Arsyad has actively participated or chaired a wide range of social and political organizations, including Muhammadiyah, Bimanese family group (*Rukun Keluarga Bima [RKB]*), National Committee of Indonesian Youth (KNPI), political party *Golongan Karya,* and Indonesia Athletics Federation (*Persatuan Atletik Seluruh Indonesia [PASI]*). In relation to his formal jobs and social involvement, Arsyad has undergone a variety of workshops and training, including Training of Trainer for *Pedoman Penghayatan dan Pengamalan Pancasila (P4)*, *Penataran Kewaspadaan Nasional (TARPADNAS), SPAMA, SPAMEN, and LEMHANAS.* Arsyad got married to Hj. Siti Faridah and blessed with three children, namely Muhammad Zaidan Jauhari, Sigit Apriyanto, and Tri Utami Afriyanti. He has now had two grandchildren, namely Farah Nurraisyah Arsyad and Fahmi Haidar Arsyad.
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