Interactive Digital Media Based on Our-Space Website in Geography Learning : ICT, Media Skills, and Learning Styles

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Abstract: This study aims to identify the availability of IT facilities and teacher characteristics towards the application of interactive digital multimedia, identification of media needs for students, and student learning styles in learning. This research was conducted at an alliance of geography teacher groups and two excellent schools in Surakarta City and Karanganyar Regency. The method used was descriptive qualitative with respondents consisting of 17 geography teachers of Surakarta City and 16 geography teachers of Karanganyar Regency, 34 students of grade XI of Surakarta 3 public high school, and 35 students of grade XI of Karanganyar 1 public high school. The data collection technique was carried out using observation techniques and questionnaires. The data analysis technique uses the Interactive Analysis Model, while the questionnaire analysis uses percentages. The results showed that: 1) teachers' experience in making IT-based media innovation and applying it in the classroom as much as 64.71% of geography teachers in Surakarta City and 81.25% of geography teachers in Karangayar Regency responded that they had never done it; 2) The need for digital-based multimedia as much as 94.12% of grade XI students in public high school 3 Surakarta and 100% of grade XI students in public high school 1 Karanganyar were interested in learning geography using integrative websites; 3) The average learning style characteristics of ninth-grade students in public high school 3 Surakarta and public high school 1 Karanganyar were 73% and 66% had a visual learning style. Based on the study's results, it was known that the low ICT skills of geography teachers could result in students' digital learning multimedia needs not being appropriately met, so integrative multimedia innovations such as the Our Space website are needed that can be tailored to student learning needs.

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Introduction

Education is one of the bridges for students to face the realities of life in the 21st century, so the education system must prepare learning patterns that follow the times students face (Nisa Humairah, Zainuddin Muchtar, 2020). In today's digital era, technology and information are developing very rapidly and have entered the world of education. A good education can adapt and apply technological developments in learning activities (Kemendikbudristek, 2022). One of the high school subjects that requires a variety of media and digital technology assistance is Geography. *Geography* is a subject that needs the help of media and spatial information technology to understand the dynamics of the geosphere on the earth's surface. Geography is one of the subjects that is classified as difficult, uninteresting, and boring for some students in Indonesia. Materials that are considered difficult by students are abstract, conceptual understanding, applicative, and mathematical operations (Meyzilia et

al., 2019). To improve students' understanding of geography learning, a creative and structured approach is needed so that it can open up students' knowledge after carrying out learning activities. Technology-based learning media is a supporting factor for the learning process in the Merdeka Belajar curriculum. The development of multimedia technology has a positive impact on learning changes by obtaining, adjusting, and using information in the learning process. The application of technology in the field of learning is believed to improve student learning abilities (Nisa Humairah, Zainuddin Muchtar, 2020).

Along with the development of digital technology, it becomes an intermediary to demand teachers to utilize technology in creating and developing learning multimedia. Learning activities that use multimedia have a positive effect on student learning outcomes. In the learning and teaching process, physical facilities considered as learning resources play an essential role for students and teachers in educational activities. Because of this importance, many studies focus on the relationship between school facilities and teaching and learning outcomes, and these studies have various target objectives. For example, (Figueroa et al., 2016) emphasized the role of facility features and conditions on student achievement, while (Uline & Tschannen-Moran, 2008; Mansor et al., 2021) tried to explore the impact of school environment quality on teacher attitudes, behavior, and performance. The results confirm a relationship between school facilities and the results of teaching and learning activities. School facilities are very important to shaping teacher creativity in learning technology innovation producing adaptive multimedia according to student learning styles and performance.

According to Djoyo Negoro in (Widjaja, 2021)), Good and complete school facilities are one of the characteristics of superior schools in Indonesia. An excellent school is an exceptional school with more value than other schools, both in terms of physical and non-physical. To determine which school group is superior or not, the Ministry of Education and Culture annually conducts surveys and rankings to determine the achievement and quality level of schools. The classification of excellent schools is assessed from several components, namely, 1) Academic and non-academic achievements 2) facilities and services 3) learning system and time 4) the minimum limit value of registration selection 5) the number of applicants compared to class capacity; 6) school fees. With the advantages, including complete school facilities, it is expected that teachers and education personnel who handle must be superior in terms of mastery of subject matter, teaching methods, and commitment in carrying out their duties. However, (Dawabsheh et al., 2020) good learning facilities if not accompanied by qualified teaching staff will cause gaps. This opinion is related to what is described by (Miftah, 2018) that the teaching staff in Indonesia lacks innovation in multimedia production due to a lack of time in making multimedia, a lack of class learning hours, and a lack of skills in making IT-based multimedia. Using inappropriate media makes "...learning becomes dry and less meaningful". Therefore, learning media is essential in the learning process to make the material presented more meaningful (Nurrita, 2018; Anita Adesti & Siti Nurkholimah, 2020).

Learning media aims to install students' thoughts, feelings, and interests to follow the learning process so that information can be absorbed optimally (Ayu Sulastri et al., 2021). To achieve this, interesting and interactive learning media are needed so students are interested in learning (Anggraeni et al., 2021). In addition, students can develop their achievements in cognitive, affective and psychomotor aspects (Wahyuningtyas & Sulasmono, 2020). At the level of class XI senior high school semester 2 there is a geography subject with mandatory disaster mitigation and adaptation material presented in Basic Competency 3.7 analyzes mitigation and adaptation of natural disasters with geography studies. Disaster

mitigation material is used for disaster risk reduction efforts by saving yourself from the threat of disaster. However, school disaster mitigation and natural disaster adaptation material has not been delivered optimally (Rizaldy, 2021). To understand the subject, media or props are needed because the use of media or props can help students understand concepts and eliminate student boredom in learning because the material is abstract (Mufti et al., 2020). With the existence of learning media, it will facilitate communication between teachers and students in understanding the subject (Nurrita, 2018). Therefore, the media used must be integrated and have an attractive appearance so that it affects students' interest in learning (Wulandari, 2020).

One of the media in the form of integrated studies that is currently developing is a website. Website is a collection of interconnected pages (Kateryna et al., 2020) in which several items, such as documents, images, and videos, are stored on a web server. *Websites* are media repositories that facilitate hosting and sharing resources to support do-it-yourself services. One of the Google sites that facilitates the creation of a free website is Google Sites. Google Sites allows non-technical users to organize and share digital information such as Web links, calendars, photos, videos, presentations, attachments, and other documents in an easy-to-manage site (Roodt & De Villiers, 2012). This website can be accessed through smartphones, laptops, iPhones, and other digital devices. Integrating material content, data, and spatial information in a Google sites media website called Our-Space is expected to be used as one of the solutions to overcome geography learning. This Our-Space website offers various new things in the form of presenting digital learning integrated with spatial information sites and presenting content that is systematically designed so that learning becomes effective.

The purpose of the Our-Space Website media is to present a concept called the information age learning space. Based on the emerging philosophy of teaching, education, and learning theory has refocused the concept of "classroom" in the form of virtual learning sites to include a wider range of contexts. This study aims to identify the availability of IT facilities and teacher characteristics towards the application of interactive digital multimedia, identification of media needs for students, and student learning styles in learning. This study is important to provide guidelines for researchers regarding the analysis of digital multimedia needs required by teachers and students, adjusted to the context of the material and student learning styles.

Research Method

The research method used descriptive with a qualitative approach. Qualitative research is an effort to explore and understand what happens to several individuals or groups, which comes from social or humanitarian issues (Creswell, Aalberg et al., 2017). This research was conducted on a group of geography teachers and two excellent schools located in Surakarta City and Karanganyar Regency where the two cities are close together, based on the administrative area of Central Java Province. The two schools chosen in this study are Public High School 3 Surakarta and Public High School 1 Karanganyar; both schools were chosen because they became superior schools in the area concerned based on the ranking results from the Ministry of Education and Culture in 2022. These two schools have very complete IT facilities compared to other schools and generally have superior learning quality compared to schools in the lower ranks. The selection of excellent schools as research samples can be used as a maximum picture of the analysis of learning needs that are a problem. This research was conducted by a group of geography teachers in Surakarta City and X1 grade students in public high school 3 Surakarta on February 2, 2023, and a group of

geography teachers and XI grade students in public high school 1 Karanganyar on July 7, 2023.

This study used multiple variables, namely identification of teachers' teaching experience and analysis of digital multimedia needs for students. Data collection was done by random sampling and using questionnaire techniques. The questionnaires were completed by 17 geography teachers in Surakarta City and 16 geography teachers in Karanganyar Regency. Thirty-four students of grade XI of public high school 3 Surakarta and 35 students of grade XI of public high school 1 Karanganyar majoring in social science. The questionnaires were used to determine the teaching experience of teachers, the level of need for digital multimedia, and the characteristics of students' learning styles. The questionnaire on teachers' teaching experience and the level of need for digital multimedia was a closed questionnaire. The characteristics of student learning styles are measured using a Likert scale with 4 answer options consisting of always, often, sometimes, and never. The results of the questionnaire were analyzed using the percentage formula beside that the data analysis technique in this study used the Miles and Huberman model consists of data collection, data reduction, data display, and conclusions (Syawaludin et al., 2019).

Results and Discussion
Identification of ICT and teaching media skills in Geography teacher groups in public senior high schools in Surakarta City & Karanganyar Regency

Given that teachers are key agents in the process of educational change and innovation who decide when and how to conceptualize ICT to assist classroom learning, it is important to recognize that teachers are the key agents in the process of change and innovation (Yusrizal et al., 2019). Therefore, teachers' teaching experience is very important in utilizing ICT in the teaching and learning process as a mechanism to improve the quality of learning in the classroom, which creates interactivity and flexibility in the teaching and learning process. Teachers with good teaching experience can create ICT into innovative media and learning resources for students (Gutiérrez Martín et al., 2022). Students can access the results of these learning innovations anywhere and anytime. Students can choose what they want to learn, when and where to learn, and it gives them greater independence, which characterizes lifelong learning. The role of ICT in learning can strengthen cognitive and creative abilities and communicative skills. However, technology alone does not add value if teachers cannot combine technology, pedagogy, and competence through one learning platform, now known as integrative multimedia (Gómez-Galán, 2020).

The success of ICT in education depends heavily on the digital competencies teachers acquire, their professional development, and the training provided to teachers (Yushau & Nannim, 2020). Among all these conditions are teachers' attitudes towards ICT, ICT skills, and training in relation to utilizing IT-based multimedia in the current educational environment. In this context, identifying the ICT-based teaching experience of a group of teachers is important to discover the learning characteristics they bring into the classroom during the learning process (Semerci & Aydın, 2018). To identify teachers' teaching experiences in utilizing technology for their teaching activities. It is necessary to consider the tools applied in the classroom and teachers' experiences, habits, knowledge, and difficulties in applying learning technology. The following are the results of the identification of the teaching experience of geography teacher groups in Surakarta City and Karanganyar Regency:

Table 1: Results of identification of ICT skills and digital teaching media in a group of geography teachers in secondary schools in Surakarta City and Karanganyar Regency

Question	Alternative Answer	Senior High School 3 Surakarta		Senior High School 1 Karanganyar		Question	Alternative Answer	Senior High School 3 Surakarta		Senior High School 1 Karanganyar	
		f	%	f	%			f	%	f	%
Teacher experience in learning technology training	a. Never	4	23.53	3	18.75	Frequency of teachers using spatial-based media (WebGis, Photo image, google earth, etc.) in geography learning at school	a.Never	5	29.41	4	25
	b.been 1-2 times	7	41.17	8	50		b.Sometimes	10	58.82	11	68.75
	c.been 3-4 times	3	17.65	2	12.5		c.Often	2	11.77	1	6.25
	d. => 5 times	3	17.65	3	18.75		d.Always in learning	0	0	0	0
Frequency of teachers using learning resources from the internet in geography learning	a. Never	0	0	0	0	Teachers' understanding of the concept of GeoCapabilities (21st century geography learning paradigm)	a. Don't know yet	13	76.47	14	87.5
	b. Sometimes	2	11.76	3	18.75		b.Somewhat familiar	4	23.53	2	12.5
	c. often	11	64.71	12	75		c.Already understand	0	0	0	0
	d.always in every lesson	4	23.53	1	6.25						
Frequency of teachers producing and applying IT-based multimedia innovations (websites, applications, e-learning etc.) in geography learning in the classroom	a. Never	11	64.71	13	81.25	If you have understood the concept of Geocapabilities, how can it be applied in geography learning at school?	a.Always apply	0	0	0	0
	b. Sometimes	4	23.53	2	12.5		b.Often apply	3	17.65	4	25
	c. often	2	11.76	1	6.25		c.Sometimes apply	14	82.35	12	75
	d. always in every lesson	0	0	0	0		d.Never applied				
Availability of learning support facilities (WIFI, infocus, digital technology, for IT-based learning) at school	a.Very sufficient	5	29.41	3	18.75	Do you (the teacher) have difficulties in delivering geography lessons at school?	a. There are no difficulties,	6	35.29	2	12.5
	b.Quite available	9	52.94	10	62.5		b. yes, there are still difficulties,	11	64.71	14	87.5
	c.Less available	3	17.65	3	18.75						
	d.Very insufficient	0	0	0	0						
The condition of digital technology availability (smartphone, tablet, laptop, iOS, etc.) owned by students for geography learning activities	a.Very sufficient	3	17.65	2	12.5	Have you ever used google sites to create integrated multimedia learning innovations?	a. Yes, ever	1	5.88	0	0
	b.Quite available	11	64.70	11	68.75		b. Never	16	94.12	16	100
	c.Less available	3	17.65	3	18.75						
	d.Very insufficient	0	0	0	0						
						Are you interested in using digital learning media in the form of "Our Space" website based on google sites that integrates media, materials, practice questions, other literacy sources and also spatial information to help you teach geography in the classroom?	a. Yes, attracted	17	100	15	93.75
							b. Not interested	0	0	1	6.25

Source: Adopted from (Gutiérrez Martín et al., 2022); (Yusrizal et al., 2019); (Topchyan & Woehler, 2021); (Brooks, 2021); (Yushau & Nannim, 2020) and modified by the author.

Based on the results of the questionnaire above, several findings can be discussed, namely:

Utilizing the internet for learning is familiar to some geography teachers in Surakarta City and Karangantar Regency. As many as 64.71% of geography teachers in Surakarta City and 75% of geography teachers in Karanganyar Regency stated that they often utilized the internet as a learning resource for students in class. Internet utilization in learning was also supported by IT-based learning facilities in Surakarta City high schools as much as 52.94% were classified as quite available, 29.41% were classified as very sufficient and in Karanganyar Regency high schools 62.5% were classified as quite available, and 18.75% were classified as very sufficient. The availability of digital devices at this time is very important, because it is part of the characteristics of 21st century learning. Where ICT is not additional, it must be applied to all subjects, which aims to support the implementation and improve the quality of student learning. In order to be in line with this, teachers must understand the 21st-century learning paradigm, especially in the field of geography called GeoCapabilities. Based on the identification results in the group of geography teachers in

Surakarta City, 76.47% are classified as unfamiliar, and 23.53% of teachers already know a little about the 21st-century geography learning paradigm called GeoCapabilities.

In connection with the lack of understanding of the concept of GeoCapabilities, it affects the use of geospatial technology media (WebGis, photo images, and Google Earth) in geography learning at school, 58.82% of geography teachers in Surakarta City and 68.75% of Geography teachers in Karanganyar Regency responded sometimes in utilizing geospatial media. The Karanganyar Regency geography teacher group revealed difficulties in delivering geography learning in the classroom. In this case, several factors hinder teachers in developing digital creativity in learning. Most of them utilize ICT to collect teaching materials, find references and learning resources, and to make quizzes. Based on the interview results obtained, the internal and external factors of teachers that hinder the development of digital media innovations include limited time to make digital multimedia because learning uses a full-day school system, the teacher's administrative burden is very much so that it drains time and thoughts are quite high, age factors and busy households that require teachers to be smart in dividing time between homework and school.

Geography teachers in Surakarta City often hold associations, discussion forums, workshops, seminars, and trainings that are held at least once a month on an ongoing basis. However, in its application, internal and external obstacles reduce teachers' motivation and willingness to apply the results of the technology training. Based on the above problems, it is necessary to identify a needs analysis for teachers in using integrated digital multimedia between media, materials, practice questions, other literacy sources, and spatial information called Our Space Website. It aims to make it easier for teachers to deliver learning materials. The results of the respondents showed that 100% of the Surakarta City geography teacher group and 93.75% of geography teachers in Karanganyar Regency needed. They were interested in applying the Our Space website to geography learning. The conclusion from the results of this study can provide enlightenment for educational planners in the classroom to actively participate in ICT training programs.

However, teachers must apply the competencies gained from training through digital multimedia works or projects packaged as teacher assignments. Why is this so important to apply? In this way, the teacher's internal motivation will develop and affect the quality of learning in the classroom.

Needs Analysis of Integrative Digital Media in the Form of Website "Our Space" in Geography Learning

Media needs analysis is related to school facilities' availability and condition. School facilities cannot be ignored as they are significantly related to teaching quality. From the literature review, it is concluded that adequate school facilities can affect the quality of teaching. If teachers are provided with adequate resources, they will likely be more productive and positive in their work (Lopes et al., 2019) in addition to the availability of good school facilities, the main driver of student learning is the quality of teachers in schools. Survey results in some of these schools show that students who study under high-performing teachers make three times more progress than students who study under low-performing teachers. The way teachers teach and how they handle the classroom does influence and improve student learning. Consequently, this adds up to an overall positive improvement in the quality of education and learning (Yushau & Nannim, 2020). Therefore, teachers with excellent school facilities should be able to improve their teaching, especially in learning technology innovation, to make it easier for students to understand the material in the learning process (Thuan & Liu, 2018; Dawabsheh et al., 2020)**.**

To find out the needs of integrative digital media, a questionnaire was prepared through indicators adopted from (Miftah, 2018) dan (Yunus & Fransisca, 2020). The following is the development of an instrument in the form of a questionnaire used for data collection. The results of filling out the questionnaire filled in by 34 students can be seen in table 2. Media needs analysis is related to school facilities' availability and condition. School facilities cannot be ignored as they are significantly related to teaching quality. From the literature review, it is concluded that adequate school facilities can affect the quality of teaching. If teachers are provided with adequate resources, they will likely be more productive and positive in their work (Hernandez, 2019). According to the findings of (Lopes et al., 2019), in addition to the availability of good school facilities, the main driver of student learning is the quality of teachers in schools. Survey results in some of these schools show that students who study under high-performing teachers make three times more progress than students who study under low-performing teachers. The way teachers teach and how they handle the classroom does influence and improve student learning. Consequently, this adds up to an overall positive improvement in the quality of education and learning (Yushau & Nannim, 2020). Therefore, teachers with excellent school facilities should be able to improve their teaching, especially in learning technology innovation, to make it easier for students to understand the material in the learning process (Thuan & Liu, 2018; Dawabsheh et al., 2020). A questionnaire was prepared through indicators adopted from (Miftah, 2018) dan (Yunus & Fransisca, 2020) to determine the needs of integrative digital media. The following is the development of an instrument in the form of a questionnaire for data collection. The results of filling out the questionnaire filled in by 34 students can be seen in Table 2.

Table 2. Results of Indicator Analysis of digital technology-based learning media needs in geography class XI in public high school 3 Surakarta and public high school 1 Karanganayar

Question	Alternative Answer	Senior High School 3 Surakarta		Senior High School 1 Karanganyar		Question	Alternative Answer	Senior High School 3 Surakarta		Senior High School 1 Karanganyar	
		f	%	f	%			f	%	f	%
Do you have a digital device such as a laptop/smartphone/tablet or similar?	a. Yes, have b. Do not have	34 0	100 0	35 0	100 0	What are the reasons you feel the need to use digital technology in your learning process?	a. Fun b. Learning is easier	8 26	23.53 76.47	18 17	51.43 48.57
Do you use your laptop/smartphone/tablet regularly?	a. Yes b. No	33 1	97.06 2.94	28 7	80 20	Do you have any difficulties in understanding Geography subject?	a. Yes b. No	11 23	32.35 67.65	26 9	74.29 25.71
How long have you been using your laptop/smartphone/tablet?	a. 2 - 10 years b. >10 years	20 14	58.82 41.18	29 6	82.86 17.14	Is the explanation from the teacher enough for you to understand the geography material?	a. Yes, it is enough b. Not enough	22 12	64.70 35.30	18 17	51.43 48.57
Approximately how many hours do you use your laptop/smartphone/tablet every day?	a. 3 -12 Hours b. >12 Hours	22 12	64.70 35.30	22 13	62.86 37.14	Does the teacher need to use media to support your understanding of geography material?	a. Yes, necessary b. Not necessary	30 4	88.24 11.76	35 0	100 0
How many hours do you use your laptop/smartphone/tablet to study every day?	a. 1 - 7 Hours b. >7 Hours	33 1	97.06 2.94	32 3	91.43 8.57	In learning geography, what media are often used by teachers?	a. Visual Media b. Digital Media	26 8	76.47 23.53	23 12	65.71 34.29
Does your school have adequate internet/wi-fi network facilities?	a. Yes, have b. Do not have	30 4	88.24 11.76	35 0	100 0	Which media do you like the most?	a. Visual Media b. Digital Media	9 25	26.47 73.53	8 27	22.86 77.14
Have you ever used digital technology-based learning media (laptop/smartphone/tablet) in the geography learning process?	a. Yes, ever b. Never	27 7	79.41 20.59	25 10	71.43 28.57	Are you interested in learning geography using digital-based multimedia?	a. Yes, Interested b. Not Interested	32 2	94.12 5.88	35 0	100 0
How often does your teacher use digital technology-based media in the learning process in the	a. Every lesson b. Sometimes	4 30 0	11.76 88.24 0	3 24 8	8.57 68.57 22.86	How accessible is the media you want for learning activities?	a. Android only b. All digital technologies	2 32	5.88 94.12	4 31	11.43 88.57

classroom?	c. Never					(Android, tablet, PC, iOS, etc.)					
Does the teacher explain the use of digital-based technology in Geography learning?	a. Explains b. Did not explain	25 9	73.53 26.47	11 24	31.43 68.57	Are you interested in learning using digital learning media in the form of "Our Space" website based on google sites that are integrated between media, material, practice questions, literacy resources and spatial information that helps you understand geography material?	a.Yes, Interested b.Not Interested	34 0	100 0	34 1	97.14 2.86
Has the use of digital technology-based learning media become a necessity for you?	a. Yes b. No	32 2	94.12 5.88	27 8	77.14 22.86	What are the reasons you are interested in using integrated digital learning resources?	a. Learning is easier b. Learning is more optimal c. Fun d. Interesting	20 8 5 1	58.82 23.53 14.71 2.94	18 6 7 4	51,43 17.14 20 11.43

Source: Adopted from (Miftah, 2018); (Yunus & Fransisca, 2020); (Anggraeni et al., 2021); (Priadi, 2023) and modified by the author

In this media needs questionnaire, 100% of 11th-grade students of Public Senior High School 3 Surakarta strongly agreed and supported the creation and development of digital learning media in the form of a Google sites-based "Our Space" website that is integrated between media, materials, practice questions, other literacy sources and also spatial information that makes it easier for students to understand geography material. Based on these data, researchers believe that website media whose integrated learning resources are made interestingly and not boring, then 58.82% of students will learn more easily, 23.53% of students will learn more optimally, and 14.71% of students will learn more enjoyable and 2.94% of students find learning more interesting. The results of the media needs questionnaire in class XI students of Public Senior High School 1 Karanganyar, as many as 97.14% of students strongly agree and support the creation and development of digital learning media in the form of a Google sites-based "Our Space" website that is integrated between media, material, practice questions, other literacy sources and also spatial information that makes it easier for students to understand geography material. Based on these data, researchers get confident that a website with integrated learning resources that are made clearly, interestingly, and not boring, then 51.43% of students choose learning will be easier, 17.14% of students will learn more optimally, and 20% of students learn more enjoyable and 11.43% of students find learning more interesting.

The two favorite schools, namely public senior high school 3 Surakarta and public senior high school 1 Karanganyar, have good facilities, around 52.94% and 62.5%. However, the frequency of applying digital technology-based media in class is classified as rare, around 88.24% in public senior high school 3 Surakarta and 68.57% in public senior high school 1 Kranganyar. These results indicate that the availability of good IT-based school facilities is not always significantly related to the quality of learning technology in the classroom. So, in the future, it is necessary to improve and increase the quality of Geography learning in public high school 3 Surakarta and public high school 1 Karanganyar. Actions that can be taken are improving teacher competence in designing and developing integrative ICT-based learning media and procuring teaching materials that can increase student learning motivation, especially in understanding natural disaster adaptation and mitigation.

Identification of Student Learning Style Characteristics

The power of adaptive interactive multimedia is that it delivers content to learners by tailoring it to their needs and learning styles. Adapting to learning styles can help improve acquiring knowledge and experience and develop students' higher-order thinking skills (Ali et al., 2019). Learning style is a parameter for designing adaptive interactive multimedia environments (Mahdi et al., 2019).). Learning styles are very influential in improving the

quality of learning and selecting appropriate learning media. Teachers need to know in advance what type of learning style the student has (El-Sabagh, 2021). It aims to assist teachers in selecting learning models, and media designs students need. The selection of professional teachers is essential to support the achievement to form quality learning. One way to improve the quality of learning is by knowing the learning styles that exist in students. By knowing students' learning styles, the teacher will know the learning media that is suitable for students so that the learning process in the classroom runs effectively and efficiently.

Each individual's learning style is different when interacting with the content presented to them because many studies emphasize the relationship between interactive multimedia and learning styles to build a motivation to improve student learning outcomes (Ali et al., 2019). The word "learning style" refers to the process by which a learner organizes, processes, represents, and incorporates information and stores it into his or her cognitive aspects. Information and experiences are then represented by learning styles that reflect techniques for communicating them (Jaleel, Sajna & Thomas, 2019). Various learning styles according to (Li et al., 2016), There are three learning styles: visual (learning by seeing), audiotorial (learning by hearing), and kinesthetic (learning by moving, working and directing). To identify the characteristics of learning styles, students fill out a questionnaire that is compiled based on indicators adopted from (Li et al., 2016), (Cholifah, 2018), (Ali et al., 2019), and (El-Sabagh, 2021).

The following are the results of calculating the learning style characteristics of students in class X1 of public senior high school 3 Surakarta and class XI of public senior high school 1 Karanganyar:

Figure 2. Learning Styles of Students in Grade XI of Public Senior High School 3 Surakarta and Public Senior High School 1 Karanganyar

Based on the questionnaire's results on students' learning styles in class XI of public high school 3 Surakarta, it shows that there are differences in students' learning styles. From 34 students, each student has the following percentage:

The above research results show that 73% or as many as 25 students in grade XI in public high school 3 Surakarta tend towards a visual learning style. The results of identifying learning styles of grade XI students in public high school 1 Karanganyar show that 66% or as many as 23 students have a visual learning style tendency. Students with a visual learning style will tend to remember things more efficiently based on their vision, better understand an order if they read the order, like reading activities, and can even enjoy reading even though they are in the middle of a commotion. According to Deporter and Mike in (Azis et al., 2022) It is mentioned that the visual learning style is learning by using a concept or idea in the form of data and information by displaying images or writings that can be seen. The characteristics of the visual learning style indicate that students prefer learning that has visual animation, whether illustrations, pictures, photos, or videos accompany the material. This condition is very suitable with the character of the learning media on the Google sites website with the

name Our Space, which will be developed by displaying visual impressions consisting of illustrative images accompanied by writing and audio to clarify and convey information.

Meanwhile, 15% or as many as 5 students in class XI at public senior high school 3 Surakarta have auditorial learning style tendencies. In addition, the identification results at public high school 1 Karanganyar show that as many as 14% or as many as 5 grade XI students have auditorial learning tendencies, where students are more easily distracted by commotion. Therefore, students with auditorial learning style tendencies will have difficulty reading material when their friends are busy in class, cannot concentrate if there is a commotion, and cannot even focus on learning if there is music playing at a large volume. It is because grade XI students in public high school 3 Surakarta and public high school 1 Karanganyar with an auditorial learning style are more likely to use their ears as a learning medium so that if other sounds come from outside the focus of learning, they will not be able to concentrate on learning.

Then 12% or as many as 4 XI students in public high school 3 Surakarta have kinesthetic learning style characteristics. Whereas in class XI students at public high school 1 Karanganyar, 20% or 7 students were identified as having kinesthetic learning style tendencies, which students with this learning style tend to be very weak in verbal activities and are always active in learning based on physical activity and movement. Students who have this learning style find it easier to grasp lessons if they move, feel, or take action. It is what makes students X in public high school 3 Surakarta and public high school 1 Karanganyar tend to have a kinesthetic learning style that cannot remember material by memorizing, preferring to be in physical contact when talking to others, even speaking very slowly when making presentations in class.

Learning styles are based on the fact that students have different styles of receiving knowledge and thinking to help them recognize and combine information in their minds and acquire experiences and skills. Adaptive interactive multimedia focuses on the student's learning experience, and learning styles play a vital role. According to the findings (Alshammar Mohammad T. & Qtaish, 2019) adaptation is based on a combination of learning styles and information levels that result in much better learning gains. This point becomes very important for researchers to personalize the interactive multimedia experience using characteristics such as students' personal learning styles. Such learning challenges can be addressed with adaptive learning programs, which provide learners with various learning content that suits their specific needs, such as their learning styles. Because every student has a different learning style. For this reason, in delivering lesson content and being presented in multimedia, a teacher's creativity is also needed to create an enjoyable learning experience for all students.

Conclusion

Based on the results and discussion above, it can be concluded that the results showed that: 1) teachers' experience in making IT-based media innovation and applying it in the classroom as much as 64.71% of geography teachers in Surakarta City and 81.25% of geography teachers in Karangayar Regency responded that they had never done it; 2) The need for digital-based multimedia as much as 94.12% of grade XI students in public high school 3 Surakarta and 100% of grade XI students in public high school 1 Karanganyar were interested in learning geography using integrative websites; 3) The average learning style characteristics of ninth-grade students in public high school 3 Surakarta and public high school 1 Karanganyar were 73% and 66% had a visual learning style. Based on the study's results, it was known that the low ICT skills of geography teachers could result in students'

digital learning multimedia needs not being appropriately met, so integrative multimedia innovations such as the Our Space website are needed that can be tailored to student learning needs.

Recommendation

The results of this study are expected to provide input for several parties; 1) teachers are expected to apply interactive digital multimedia in the learning process, 2) for school principals are expected to ensure the availability of IT facilities to support learning activities and improve teachers' ICT competencies through training in interactive digital multimedia production and its application in the classroom, 3) for other researchers are expected to conduct similar research with different regional subjects. To obtain a comparison and description of the condition of teachers' ICT skills and the use of website-based interactive digital media in learning.

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