

# Identifying the Learning Style and Learning Resource Preferences of Junior High School Students After the Covid-19 Pandemic in Surakarta

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**Abstract.** The successful learning of science education depends on multiple factors, including curriculum changes, educational facilities, diverse learning sources, and classroom instruction. Each student possesses a unique learning style. This study aims to identify the preferred learning styles and sources of junior high school students in Surakarta, serving as a preliminary step in module development. The research took place at SMP N 4 Surakarta with a sample of 56 purposively selected students. Data was collected through surveys and participatory observations. Based on VARK models, the analysis revealed that the primary learning style preference among junior high school students was visual (average = 41.07%). The secondary learning style preferences were kinesthetic (average = 32.18%), audio (average = 12.50%), and read (14.25%). Visual learners tend to read instructions before studying, learn effectively by reading teacher notes on the board, grasp information better through reading than listening, and favor reading textbooks over listening to teachers.

**Keywords:** Learning Style Preference, Learning Source Preference, Junior High School, Pandemic covid-19

## 1 Introduction

Student learning styles and learning resources are important factors that can influence student success in achieving learning outcomes [1]. Learning styles and learning resources are interrelated to each other. Students who have auditory learning styles will certainly be happier with learning resources that can be listened to and also apply to each student who is different in line with the learning resources used. Learning styles and learning resources differ in that learning styles are internal factors while learning resources are external factors. Both factors when combined properly can affect learning success.

The COVID-19 pandemic that has passed, has left the impact of changes in learning styles and learning resources used by students. During the covid pandemic, much learning was carried out

online, both synchronous and asynchronous [2]. In online learning, students are required to be independent in learning and responsible for the learning challenges to be mastered. However, the online learning process causes culture shock and boredom in students[3]. When offline learning or face to face learning is carried out, the government through the Ministry of Education implements an independent learning curriculum, this curriculum is designed to pay attention to the different backgrounds of students so that the term differentiated learning appears. Differentiated learning is the concept of the learning process that pays attention to the social background and learning styles of students included the process of tailoring lessons to meet each student's individual interests, needs, and strengths[4], [5]. The learning style map of students is a very important provision to determine learning resources, learning methods, and learning models that will be implemented by teachers. Observation of learning styles and learning resources is very important for teachers to determine the learning strategy to be designed.

Several studies related to learning styles and preferences of student learning resources have been carried out by several researchers. Altamimi (2022), uses regression techniques to predict student learning styles during the COVID-19 pandemic. The results showed the accuracy of the techniques used by 72 students and produced a profile of Visual, Audio, Reading, and Kinesthetic student learning style for lesson plan[6]. Furthermore, there is research on the effects of learning styles on learning outcomes during the COVID-19 pandemic which states that there is no significant difference in student learning achievement based on student learning styles[2]. Sulistyanto et al. (2023) has combined the VARK learning style with the hybrid learning model to demonstrate how this combination might help elementary school critical thinking abilities [7]. Li J (2019) Li J studies the relationship between learning styles and student learning outcomes in engineering laboratories and describes the typology of student learning styles. The results demonstrate a very low connection since student learning outcomes are influenced by evolving technology[8]. Based on research that has been conducted, it shows that there has been no research that explicitly dived into studies on student learning style preferences and learning resources after the COVID-19 pandemic especially in junior high school.

This study examines what learning styles junior high school students prefer after the COVID-19 pandemic, what learning resources are students' favorites after the COVID-19 pandemic. The findings of preliminary studies related to existing learning styles and learning resources can be used as basic data for product development such as textbooks for junior high school student.

## 2 Method

To determine the learning preferences and styles of junior high school pupils, a survey research design was employed in the study. The goal of survey research is to characterize an event, a group, or a phenomena in its natural environment, whether it be in the present or the past [9], [10]. The research participants consists of one junior high school in Surakarta with subject students in grade seven. During the pandemic, these participants experienced online learnings. The total number of participants was 56 students. Purposive sampling, also known as judgmental sampling, was the sample method employed in this investigation. As advised by the teacher, the pupils were selected to serve as the sample. The survey consisted of two sections; Student Learning Style Preferences and Student Learning Resource Preferences. Data were obtained by interview, observation, and filling out questionnaires. A teacher and a few students served as the study's informants, and the observation was conducted in a setting typical of a classroom or lab. A questionnaire is the research tool used in this study. According to theoretical research, the questionnaire items are structured based on markers of learning styles, specifically visual, auditory, and kinesthetic types. The data analysis used Miles and Huberman techniques (1994) namely data reduction, data display, verification / drawing conclusions [11].

## 3. Result and Discussion

### VARK Learning style

Learning styles are not the main source in developing a learning method but can be an alternative for teachers to provide various platforms, learning methods and learning models that can accommodate all student learning styles. The characteristics of the VARK learning style are as follows;

- a. Visual. The traits of students who like this learning style are those who have a tendency to see or watch things, including pictures, outlines, coordinators, illustrations, displays, whiteboards, stick exercises, instructional TV, YouTube, non-verbal communication, diagrams, exhibitions, shows, free bees, and movies. Students with this type usually use articulation to show something to themselves [12].
- b. Audio. The hallmark of the auditory learning style is having a tendency to exchange data through verbally expressed words, self or others, and sounds. Students with this learning style like tapes and podcasts or play YouTube but don't see it or just listen to it. Students with this learning style are able to absorb information from the description they hear well, besides that students with the type of audio learning style usually read aloud so that they can listen to the text they read [13].
- c. Read. Students with this learning style like or more easily absorb information from text or words. The text in question can be in print forms such as from modules, magazines, textbooks, reference books or non-print or electronic such as data on the internet, google, Wikipedia and others. students with this learning style usually like to underline text and mark important points in the text using colour pencils.
- d. Kinesthetic. This type of learning style is characterized by students who are physically active and tend to like to carry out direct experiences such as, feeling,

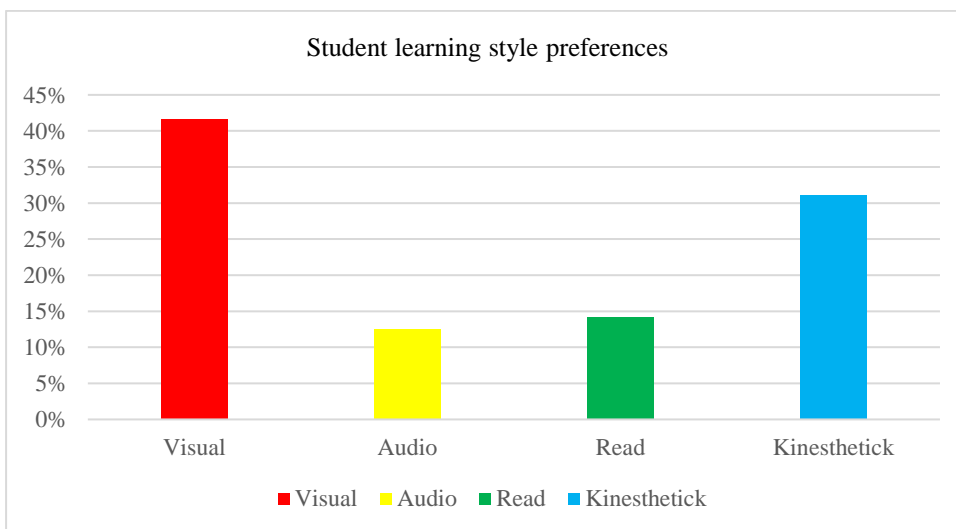
holding, working on lab projects or practicums, simulations, and educational games and group work[14].

Learning style preference data were obtained through the distribution of Visual, Audio, Reading, and Kinesthetic (VARK) learning styles. 12 questionnaire questions using Likert scales with a scale of 1 to 5 (1= strongly disagree, 2= disagree, 3= agree, 4= strongly agree), to obtain visual learning style data (questions 1,2,3) audio learning styles (4,5,6) reading learning styles (7,8,9) and kinesthetic learning styles (10,11,12) filled out by students resulting in data as follows:

**Table 1.** Student learning style preferences

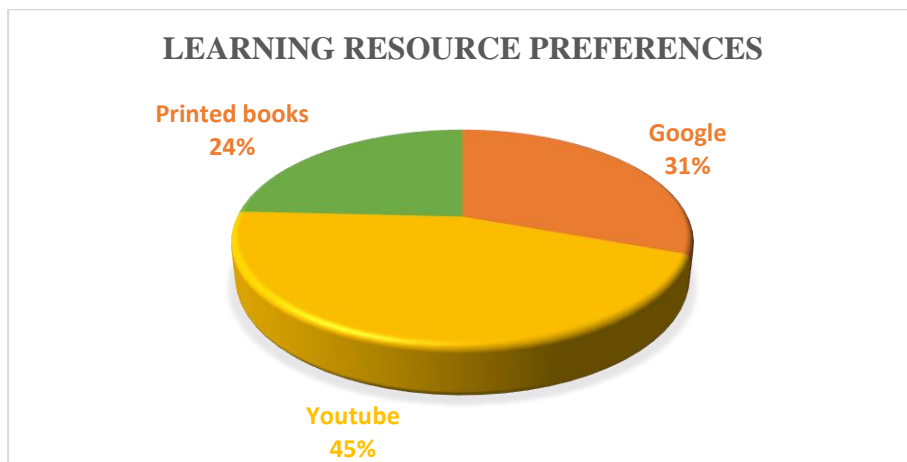
Number of respondents	Types of Learning Styles	Number of participants	percentage
56	Visual	23	41,07%
	Audio	7	12,50%
	Read	8	14,25%
	Kinesthetic	18	32,18%

From the 56 respondents that filled out the questionnaire, the data was then tabulated using an excel Microsoft so that it could be visualized, as shown in the figure. 1



**Fig. 1.** Student learning style preferences

Furthermore, for learning resource preferences, students are given 3 columns to independently fill in their favorite learning resources. Students are given the freedom to choose the same electives. The results of the survey of students' favorite learning resource preferences are presented in Figure. 2



**Fig. 2.** Learning resource preference by student

Based on the results of the analysis of learning styles that became student preferences after the COVID-19 pandemic, Table.1 showed that 29% or 23 Junior high school students liked visual learning styles, audio and reading learning style preferences showed very low scores, just 7 and 8 students or 12.50% and 14.25%. Furthermore, the kinesthetic type learning model was 32% of 18 respondents tended to like this learning style. The results of this study differ slightly compared to pre-pandemic preference results, pre pandemic kinesthetic learning preference tends to be low[1], [14], [15]. After the pandemic ended, the kinesthetic learning style experienced a significant rise due to the very strong desire of the students to never carry out kinesthetic learning processes during the pandemic.

Based on the results of random interviews with students, it shows that in the atmosphere of the COVID-19 pandemic, students prefer to learn using online learning resources. Listening to learning resources on YouTube is one of students' favorite learning activities. This learning style continues until the pandemic ends. This learning style preference cannot be applied to the synthetic learning method. because students use the YouTube platform using their parents' cellphones. Besides that, the school does not allow students to bring cellphones to school. so that the learning process via YouTube is often carried out by students independently without assistance from the teacher[16].

The dominance of audio learning styles correlates with the learning resources that students choose. As seen in Table 2. YouTube platform is the most chosen learning resource by students. The YouTube platform offers interesting learning resources and students find that videos are easier to understand and easy to find answers to learning questions on YouTube. In addition to YouTube, students also use Google to learn. Students use Google to search for several online learning platforms such as brain.ly and Zenius. The platform is often used by students to find reference answers to questions given by teachers[17].

Kinesthetic learning style is the number two favorite learning style preferred by students. Kinesthetic learning style refers to learning styles that involve physical aspects such as feeling, moving, touching and others[18]. A concrete example of this learning style is practicum. Further interviews were conducted to find out more about the deeper reasons regarding kinesthetic

learning preferences. The informant added that "During the Covid pandemic and online learning, we miss school, face to face learning and are eager to carry out practicum activities". Further observations obtained information that after entering school in the early days of school and online learning showed that practicum could not be carried out, this was because many practicum tools were damaged and not maintained. The two years pandemic has caused many practicum tools to be broken and dusty so that the implementation of practicum cannot be carried out in the early days of entering school after the pandemic, similar things not only happen in Indonesia but also in various regions in the world[19].

Based on the description of the research above, it needs to be reviewed related to learning style preferences in junior high school students after the COVID-19 pandemic. Research that has been conducted conditions respondents to choose one of the many existing learning styles, learning styles are a combination of absorption, and information processing in the learning process [20]. The tendency of student learning styles refers to the benchmark of the speed of knowledge acquisition supported by media and technology. In addition to aspects of existing learning style aspects of information processing such as analytical ability, and respond to new information also affect information reimagining[15].

The high audio learning style during the covid pandemic is a demand for the absence of a practicum learning process. Virtual experiments uploaded on YouTube and some science learning platforms are expected to help students to understand an experiment and gain new knowledge[21]. Some innovations made in what has been done include making a learning process using several computational tools and giving simple programs at home. The high enthusiasm of students in the implementation of practicum or kinesthetic learning leads students to carry out simple practicum at home. However, this condition does not apply to junior high school students, students tend to be confused when learning practicum independently, and students at the first middle school level tend to prefer to carry out practicum activities in groups[14].

The results of the study are different from some studies that have been reviewed[1], [14], [15]. The main factor of the difference certainly lies because of the Covid-19 pandemic which causes distance learning to be required. In addition, technological progress factors also affect student learning style preferences. Some different findings include research conducted by Albeta (2021) which examines the effect of student learning styles on learning performance during the COVID-19 pandemic, obtained data that informs auditory learning styles dominate compared to visual and kinesthetic learning styles. The difference occurs because the research subjects are different between junior high school students and college students. Audio-type learning styles during the Covid-19 pandemic dominated more during the Covid-19 pandemic among chemistry students in universities[2]. Studies have already confirmed the influence of students' learning styles on their academic achievement. A variety of learning-style frameworks have been implemented in various health science areas of study[22].

In order to carry out the process of obtaining information and gaining knowledge through learning resources or the environment, learning is often an individual activity. A person has to be able to feel, recall, think, and solve issues. They employ a variety of learning strategies to acquire knowledge[23]. With the Covid-19 pandemic, students are now experiencing something new when it comes to online learning. While student learning styles vary, there is no difference in learning performance, so students' ability to adjust to new circumstances is crucial. Baherimoghadam (2021), who asserts that having a solid understanding of learning can help

students adjust to their surroundings, concurs with this outcome. This study was carried out with online learning during the Covid-19 pandemic[22].

Findings from learning style preferences and learning resources that are students' favourites become the basic capital of further research, which is related to the development of science teaching materials. The development carried out should refer to the student's favourite learning style and learning resources. The learning model used in teaching materials also pays attention to students' learning style preferences.

#### 4. Conclusion

Based on the results of the study above, it shows that the most preferred learning style preference by students is Visual learning style. This learning style is also in line with YouTube which is the most favorite learning resource used by first middle school students. Kinesthetic style is the most desired source of learning for students after the pandemic. This research is still limited to preliminary studies for development research, further research on the learning styles of students at various school levels and their effects on learning outcomes still needs to be done.

#### References

- [1] Jamulia J, Feb. 2018 Identifying Students Learning Style Preferences At Iain Ternate *International Journal of Education* 10, 2.
- [2] Albeta S W Haryati S Futra D Aisyah R and Siregar A D, Jun. 2021 The Effect of Learning Style on Students' Learning Performance During the Covid-19 Pandemic *JTK (Jurnal Tadris Kimiya)* 6, 1 p. 115–123.
- [3] Ghodrat Abadi M, 2021 Understanding the Academic Shock of Covid-19: How are Students' Perceptions of Online Learning Evolving Over Time? in *2021 ASEE Virtual Annual Conference Content Access* p. 1–13.
- [4] Gibbs K, Jan. 2023 Differentiation in practice: an exploratory investigation in an Australian mainstream secondary school *Teaching Education* p. 1–19.
- [5] Lindner K-T and Schwab S, Sep. 2020 Differentiation and individualisation in inclusive education: a systematic review and narrative synthesis *International Journal of Inclusive Education* p. 1–21.
- [6] Altamimi A M Azzeh M and Albashayreh M, Feb. 2022 Predicting Students' Learning Styles Using Regression Techniques *Indonesian Journal of Electrical Engineering and Computer Science* 25, 2 p. 1177–1185.
- [7] Sulistyanto H Prayitno H J Utama Narimo S and Sutopo A, 2023 The Effectiveness of Hybrid Learning-Based Adaptive Media to Empower Student's Critical Thinking Skills: Is It Really for VARK Learning Style? *Asian Journal of University Education* 19, 1 p. 95–107.
- [8] Li J Han S and Fu S, Sep. 2019 Exploring the relationship between students' learning styles and learning outcome in engineering laboratory education *J Furth High Educ* 43, 8 p. 1064–1078.
- [9] Wu D and Li W, Nov. 2022 The Interim Characteristics of Large-Scale Online Education at Chinese Institutions of Higher Education—An Empirical Study Based on a Questionnaire Survey of Students, Instructors, and Administrative Personnel *Chinese Education & Society* 55, 6 p. 330–383.
- [10] Wilkinson S D and Penney D, Jul. 2023 A national survey of gendered grouping practices in secondary school physical education in England *Phys Educ Sport Pedagogy* p. 1–16.
- [11] Huberman A M , & M M B, 1994 *Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), Handbook of qualitative research* Thousand Oaks, CA: Sage.

- [12] Othman N and Amiruddin M H, 2010 Different perspectives of learning styles from VARK model in *Procedia - Social and Behavioral Sciences* 7 p. 652–660.
- [13] Aboe R M, 2018 Correlation Between Students Learning Styles and Their Learning Achievement in *Seminar nasional pendidikan* p. 1–10.
- [14] Adapa S N S K Gandi N and Mugili M, 2020, Collaborative Teaching by Identifying Students Learning Style, in *Innovative Teaching and Learning Process during COVID 19*, (IOR PRESS), p. 23–25.
- [15] Afrila D and Rahman A, Jul. 2019 Analisis Gaya Belajar Siswa pada Mata Pelajaran IPS di Kelas VII SMP Negeri 9 Kota Jambi *Jurnal Ilmiah Universitas Batanghari Jambi* 19, 2 p. 379.
- [16] Kamişli H and Özonur M, 2019 Students' learning styles in vocational education *International Journal of Curriculum and Instruction* 11, 1 p. 209–220.
- [17] Maya Ida F and Maksun H, 2020, Contribution of Learning Style, Learning Creativity and Exploratory Interest to Students' Simulation and Digital Communication Learning Outcomes during the Covid-19 Pandemic.
- [18] Sangvigit P Mungsing S and Theeraroungchaisri A, 2015 Correlation of Honey & Mumford Learning Styles and Online Learning media preference *Panarat Sangvigit et al ,Int.J.Computer Technology & Applications* 3, 3 p. 1312–1317.
- [19] Fox M F J Hoehn J R Werth A and Lewandowski H J, Jun. 2021 Lab instruction during the COVID-19 pandemic: Effects on student views about experimental physics in comparison with previous years *Phys Rev Phys Educ Res* 17, 1 p. 010148.
- [20] Bayu Firmansyah M Siswanto W and Tri Priyatni E, 2020 Multimodal Smartphone: Millennial Student Learning Style *Test Engineering and Management* 82, 1 p. 9535–9545.
- [21] Qiang Z Obando A G Chen Y and Ye C, Sep. 2020 Revisiting Distance Learning Resources for Undergraduate Research and Lab Activities during COVID-19 Pandemic *J Chem Educ* 97, 9 p. 3446–3449.
- [22] Baherimoghadam T Hamedani S mehrabi M Naseri N and Marzban N, Dec. 2021 The effect of learning style and general self-efficacy on satisfaction of e-Learning in dental students *BMC Med Educ* 21, 1 p. 463.
- [23] Cahya Ritonga N and Fitriah Rahma I, 2021 Analisis gaya belajar VAK pada pembelajaran daring terhadap minat belajar siswa *Jurnal Analisa* 7, 1 p. 76–86.