# THE CORRELATION BETWEEN VISUAL, AUDITORY, AND KINESTHETIC (VAK) LEARNING STYLES ON LEARNING INDEPENDENCE OF 8TH GRADE STUDENTS IN STATE JUNIOR HIGH SCHOOLS IN YOGYAKARTA CITY, INDONESIA

**Syahrir[i],**
**Fahrul Arfandi M. Nur,**
**Musdalifa As,**
**Pujirianto**
Master Educational Technology,
Faculty of Education and Psychology,
Yogyakarta State University,
Yogyakarta, Indonesia

**Abstract:**
Learning styles are complex ways in which students most effectively understand, process, store, and remember what they are trying to learn. Students who know their type of learning style can make it easier for them to choose and sort out the right learning resources so that they can support students' independence in learning and help students develop metacognitive skills, namely the ability to understand and regulate their own learning process or with the term self-regulated learning. This research aims to: 1) Describe students' learning styles; 2) describe students' learning independence; and 3) analyze the correlation between students' learning styles and students' learning independence. The research method used is quantitative research of correlational type with associative method. This research was conducted at State Junior High Schools 14 of Yogyakarta and State Junior High Schools 15 of Yogyakarta. The study population was 8th grade students with a sample size of 79 students. Data collection techniques and instruments used questionnaires designed based on learning styles (VAK). The results showed that: 1) Students' learning styles are dominated by visual learning styles as many as 47 students, auditory 23 students, and kinesthetic 9 students. 2) learning independence with a presentation above the average 7.9%, average 19%, below average 30.02%, and low 9.48% so it can be concluded that the learning independence of 8th grade students is below average. 3) The chi-square statistical test shows (chi-square = 3.774, df = 6, p = 0.707) from the results it can be concluded that there is no significant relationship between "learning style" and "learning independence".

**Keywords:** learning style, student characteristics, learning independence

[i] Correspondence: email syahrirukkas@gmail.com

## 1. Introduction

Education grows and develops along with technological advances (Santos-Meneses & Drugova, 2023). This can be seen from the wide variety of technologies (Fitriyana et al., 2020) that teachers can use to facilitate students in achieving learning objectives (Privitera et al., 2023). In learning, students need to be equipped with four 21st century skills: critical thinking, creativity, collaboration, and communication (Santos-Meneses & Drugova, 2023). Therefore, teachers must prepare lessons that can develop these skills.

In designing a lesson, teachers should use the classification of learning variables as a guideline and foothold (Budiningsih, 2015). By this learning can be effective, efficient, and engaging (Pribadi B.A., 2023). Learning variables (Reigeluth, 1983) are classified into three main variables, namely: learning conditions, learning methods, and learning outcomes. The learning condition variable consists of the objectives of the field of study, the constraints of the field of study, and the characteristics of the learners (Miarso, 2004). The characteristics of the lesson include what objectives are to be achieved in the lesson, as well as what are the obstacles to their achievement. The method variable consists of the organization of teaching materials, delivery strategies, and management of activities (Khawarizmi et al., 2020). Meanwhile, learning outcome variables are classified into three (3), namely teaching effectiveness, efficiency, and learning attractiveness (Pribadi, B.A., 2023).

From the description above, it can be concluded that in designing a lesson, teachers need to understand the learning objectives to be achieved. By knowing clear objectives, teachers can design learning activities and materials that are relevant and in accordance with student needs, so that learning can improve students' understanding, knowledge, skills and motivation (Almomani et al., 2023). In addition, by understanding learning objectives, students can identify their strengths and weaknesses in learning, as well as develop effective strategies to achieve their learning objectives (Zrudlo, 2023).

The unique and diverse characteristics of students in terms of their prior knowledge, motivation and learning style are important concerns in designing learning because students are the subject of learning (Pribadi. B.A., 2023). One of the uniqueness of students is that they have different learning preferences, and not everyone is suitable for one type of learning (P.-J. Lee & Wu, 2022). Learning styles are the dominant ways used by individuals in managing learning information (Lyle et al., 2023). Meanwhile, according to Yotta (2023), learning style is the way that students typically prefer to learn. From some of these definitions it can be concluded that learning styles are the complex ways in which students most effectively understand, process, store and remember what they learn.

According to Rubin et al. (2022), students have preferred learning modalities such as Visual, Auditory, Kinesthetic abbreviated as (VAK), Ezzeddine et al. (2023) visual learning style tends to understand and remember information better through the use of pictures, concept maps, and other visual materials. According to Goosen & Steenkamp,

(2023), auditorial learning style as the way individuals prefer to assimilate information by listening to and processing sounds. They tend to understand and remember learning material better when it is presented in oral form, such as lectures, conversations, or voice recordings, whereas auditory learning style is the way individuals prefer to assimilate information by listening and processing sound (Yotta, 2023). Kinesthetic learning style refers to an individual's preference for understanding and remembering information through physical experience and movement. Individuals with kinesthetic learning styles tend to learn more effectively when they engage in physical actions, practices, experiments or explorations that allow them to 'feel' and 'do' (Goosen & Steenkamp, 2023).

## 2. Literature Review

### 2.1 Learning Style
Each individual has diverse intelligence potential and different learning preferences. Intelligence is not only limited to intellectual or academic intelligence, but also includes various aspects such as emotional, social, kinesthetic and other intelligences. Therefore, an effective educational approach should take this diversity into account by recognizing and supporting different types of intelligence and learning styles. This allows each individual to optimize their potential and achieve maximum understanding and achievement through learning methods that suit their intelligence characteristics and learning preferences (Agrawal & Vardhan, 2023).

VAK (Visual, Auditory, Kinesthetic) learning style theory suggests that individuals have certain preferences in terms of how they most effectively process information and learn. These learning styles fall into three main modalities: visual, auditory and kinesthetic. Individuals with visual preferences prefer to process information through pictures, graphs or visualizations. They tend to learn better through whiteboards, diagrams, or visual presentations. Meanwhile, auditory individuals dominate in learning through hearing and sound. They can better understand material through lectures, discussions, or audio recordings. Kinesthetic individuals prefer to process information through physical activity or hands-on experience. They tend to learn better through hands-on practice, experiments or simulations. While this theory is popular, it is important to remember that each individual can have a combination of these three modalities, and a more holistic approach to learning styles is often more relevant (Rubin et al., 2022).

Visual learning style is a learning preference in which individuals are more effective at understanding and remembering information through visual stimulus. People who have a visual learning style tend to absorb knowledge better through pictures, diagrams, graphs and visual presentations. They can understand abstract concepts better when presented visually, and often use imagination and visual memory to reinforce their understanding of learning materials (Rubin et al., 2022).

Auditory learning style is a learning preference where individuals tend to be more effective at understanding and remembering information through hearing. People with an auditory learning style often process information best through hearing sounds, such as lectures, conversations, or spoken material. They may find understanding better through oral exposure, audio recordings, or verbal discussions, and use hearing as their primary means of capturing and processing learning information (Yotta, 2023)

Kinesthetic learning style is a learning style where people prefer to learn by using movement, physical activity and hands-on experience. They tend to understand ideas better through direct action, such as conducting experiments, participating in simulations, or using physical objects to understand and remember information (Lokare & Jadhav, 2023)

Learning style as a characteristic of cognitive, affective, and psychological behavior that serves as a relatively stable indicator in responding to the learning environment (Keefe R., 1979). Learning styles are useful to determine the potential for learning success because learning styles provide information about individual differences in preferences (Akhmad Sugianto et al., 2023), learning styles can suggest how learning can best be designed to support learning preferences (Akdemir & Koszalka, 2008). By modifying learning strategies by adjusting students' learning styles can make learning more effective and efficient (Zrudlo, 2023). This is in line with the research results (Aprita & Sari, 2014) shows that using a variety of learning strategies tailored to the VAK learning style model, can increase mostivation to learn as well as the potential for effective learning to occur if their preferred learning style is considered and catered for (Deng et al., 2022). In addition, from the research results Lyle et al. (2023), is shown that the learning process that is adapted to students' learning styles can increase the effectiveness of learning and help students understand the material better.

Students who know their learning style type can adjust independently to choose and sort out the right learning resources (Boland & Amonoo, 2021), so that it can support student independence in learning (Zrudlo, 2023), especially supported by a more effective learning environment (Pujiriyanto, 2021). One indicator of effective learning is if students are actively involved in learning activities (Mahbubi, 2021). In addition, effective learning can also help students develop metacognitive skills, which is the ability to understand and regulate their own learning process or self regulated learning (Karlen et al., 2023).

## 2.2 Learning Independence / Self-regulated Learning

Self-regulated learning is a cyclical process, where the learner becomes an active and reflective agent in their own learning (Zimmerman, 2002). Self-regulated learning is an independent process where learners proactively transform their mental abilities into academic skills by using various strategies to achieve learning goals (Guo et al., 2023). Self-regulated learning (SRL) is a learning strategy that gives students the freedom to effectively manage their own learning in various ways so as to achieve maximum

learning results (Breitwieser et al., 2023) . From the definition that has been described, it can be concluded that self-directed learning is a process where individuals actively control, organize their own learning and develop independence and become effective lifelong learners.

Gibbons. M. (2003) said that self-directed learning involves the active role of students in managing and guiding their own learning process. Providing autonomy in the learning process can be an effective approach to unleashing an individual's creative potential. Autonomy in learning involves giving individuals the freedom to organize how they learn, explore topics that interest them, and develop projects that reflect personal interests (Liu et al., 2023). Emphasized the importance of empowering adolescent students to not only be recipients of information, but also to be initiators of learning, capable of designing and directing their learning experiences. Self-directed learning, according to Gibbons, creates an environment where students become independent in their exploration of material, develop self-skills, and take full responsibility for their educational development, creating a solid foundation for academic excellence and self-development (Gibbons M., 2003).

Yumna et al. (2020) affirm that there are several characteristics of self-regulated learning, namely:

1) Work independently on tasks assigned to them and plan how to manage time and resources, both internal and external, when completing the tasks.
2) Having a need for challenge, which indicates that students have a tendency to adapt to the difficulties they face when completing their tasks and turn them into fun and interesting challenges.
3) Able to learn with perseverance and use specific learning strategies students who engage in self-directed learning when engaged in activities such as reading, writing, or discussing with other students tend to derive meaning or understanding from what they read, write, or discuss.
4) Realizing that one's ability is not the only thing that makes them successful in learning requires consistent learning strategies and effort.

Self-directed learning is essential in preparing students to become lifelong learners so that they can survive in the midst of disruptions in various fields of lif (M. Lee et al., 2023).

According to Zimmerman (2000), there are three phases of self-regulation, namely:
1) the forethought phase to analyze a task as well as setting goals, strategic planning, and preparing oneself with motivational confidence,
2) the performance control phase to manage and monitor one's progress based on the goals and plans set in the forethought phase, and
3) the self-reflection phase to evaluate one's results and feedback on the self-reflection information in the forethought phase. There are certain skills required for self-directed learning, such as skills in self-evaluation, a sense of appreciation,

skills in applying self-reinforcement and cooperation, and a willingness to learn independently (Almomani et al., 2023).

Motivated and purpose-driven learning is a very important part of expanding the knowledge of learners of all ages. Motivational and cognitive processes play a crucial role in shaping lifelong learning that is based on internal motivation and clear goals. The two processes work together from childhood to adulthood, it is important to further understand the relationship between motivational and cognitive aspects in the lifelong learning journey, so as to improve the effectiveness of learning strategies and self-development of learners from different developmental stages (Cronin-Golomb & Bauer, 2023).

Each grade level brings unique challenges in adapting self-directed learning (SDL). The specifications for each grade show an evolution from the introduction of SDL activities in Grade 8 to higher levels such as self-directed learning in Grade 12. In Grade 8, students are introduced to SDL activities, while by Grade 9, they are expected to start thinking independently. At the next level, students are increasingly invited to manage their own learning (Grade 10), plan themselves (Grade 11), and ultimately, be self-directed (Grade 12). The highest achievement is the ability of students to undertake a year of fully self-directed learning, which involves the ability to negotiate a learning contract. This suggests that the development of SDL skills is a gradual and profound process that culminates at the final level of secondary education (Gibbons M., 2003).

Self-directed learning enables the development of metacognitive skills i.e. self-understanding of how they learn. (Puteh & Ibrahim, 2010). These skills can be applied in various aspects of life, helping individuals become more efficient and effective in achieving their goals (Martínez-López et al., 2023). Seeing the importance of independent learning that has been described above, therefore the researcher wants to know whether there is an influence of student learning styles on the learning independence of 8th grade students at the junior high school level as an initial introduction to independent learning.

The results of research named "The relationship between self-directed learning and learning style" conducted by Canipe (2001) showed that there is no significant relationship between self-directed learning readiness and learning style, the results occurred in all types of learning. The learning style studied by Canipe uses the Learning Style Inventory (LSI) learning style model, where people with a high level of self-directed learning can adapt easily so that learning style is not the main thing that affects a person's self-directed learning ability. However, from the results of research conducted by Aljohani & Fadila (2018) and supported by the results of recent research by (Ballad et al., 2022) which shows a correlation between learning style and self directed learning readiness.

Based on the results of the literature study above, researchers need to make observations to find out the correlation between learning styles and learning independence of 8th grade junior high school students. From the results of observations at State Junior High Schools 14 of Yogyakarta and State Junior High Schools 15 of

Yogyakarta, information was obtained that students did not understand the characteristics of their learning styles and did not know the strategies and ways to receive learning information that were more effective with their learning styles.

Based on the above problems, researchers are interested in conducting research with the title "Correlation Between Visual, Auditory and Kinesthetic (VAK) Learning Styles Towards Learning Independence of 8th grade Junior High School Students".

The objectives of this study are:
1) Describe student learning styles;
2) describe student learning independence; and
3) analyze the correlation between student learning styles and student learning independence.

## 3. Material and Methods

The research method used is quantitative research of correlational type with associative method. According to Sugiyono (2022), quantitative research is a research method based on the philosophy of positivism, used to research on certain populations and samples, data collection using research instruments, data analysis is quantitative / statistical with the aim of testing predetermined hypotheses. While correlational research is a type of research with problem characteristics in the form of a correlational relationship between two or more variables, the data collection techniques and instruments used are questionnaires. Questionnaire is a data collection technique where respondents are presented with a series of statements or questions in writing to answer (Haryanto, 2020).

This research was conducted at State Junior High Schools 14 of Yogyakarta and State Junior High Schools 15 of Yogyakarta; the population in this study were 8$^{th}$ grade students. The sample in this study were 8$^{th}$ grade students which amounted to 79 students while the sampling technique was stratified random sampling.

The research was conducted by distributing learning style questionnaires and learning independence questionnaires. The learning style questionnaire used in this study refers to the student learning style questionnaire developed by the teacher Akhmad Sugianto (2021).

Based on the table of reliability test results, it is known that the Cronbach's alpha value is 0.783, where this value> 0.60 is declared to have a high level of reliability and is consistently used in research, while the lattice of student learning style instruments is described in Table 1.1 as follows:

**Table 1.1:** Student Learning Style Grid

| No | Aspect | Indicator | Answer Options |
|---|---|---|---|
| 1. | Visual Learning Style | 1. How to learn by reading<br>2. Likes to take notes<br>3. Reads quickly and diligently<br>4. Easily remember what is seen rather than what is heard<br>5. Not distracted by noise<br>6. Often answers questions with yes/no<br>7. Fast speech pattern<br>8. How to work following drawing instructions and a good long-term plan 8.<br>9. How to communicate directly/see facial expressions<br>10. Preferred activity is demonstration<br>11. Prefer art over music | A |
| 2. | Auditorial Learning Style | 1. Learn by listening<br>2. Difficulty in writing/recording but good at telling stories<br>3. Read aloud<br>4. Easily remembers what is discussed/explained rather than what is seen<br>5. Easily distracted by noise<br>6. Often answers questions at length<br>7. Moderate and rhythmic speech patterns<br>8. Works while talking and can mimic voice changes<br>9. Likes to communicate over the phone<br>10. Preferred activity is discussion/talking<br>11. Prefer music over art | B |
| 3. | Kinesthetic Learning Style | 1. How to learn fun with a practical model<br>2. Lots of writing without re-reading<br>3. Reading by using finger as a pointer<br>4. Remember by writing information many times<br>5. Unable to sit still for long periods of time<br>6. Often answers questions with body movements | C |

The data obtained through the questionnaire was analyzed using descriptive statistical analysis. Descriptive statistics are statistics used to analyze data by describing or describing the data that has been collected. After obtaining the correlation coefficient, conclusions are drawn as the purpose of this study. The data obtained were analyzed using bivariate analysis. This bivariate analysis is used to determine whether there is a correlation or relationship between the 2 variables studied.

Both analyses were carried out with the help of the SPSS 17.0 program.

## 4. Results and Discussion

Based on the results of research conducted at Junior High Schools 14 and 15 Yogyakarta in 8th grade which amounted to 79 people divided into 3 classes. The case processing Summary data is as follows:

**Table 1.2** Case Processing Summary

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| Learning Styles * SDLRS | 79 | 100.0% | 0 | 0.0% | 79 | 100.0% |

Researchers can collect data through questionnaires filled out by students, then given a score on each statement item so that the data can be analyzed descriptively. after the data has been analyzed, then calculate the number of scores obtained from each learning style (Visual, Auditory, and Kinesthetic). To find out the dominant learning style in each class, use the percentage formula, namely:

$$P = \frac{F}{N} * 100$$

Description:
P = Presentation to be sought,
F = Number of students in each aspect,
N = Total number of students.

Furthermore, see the highest score among the three student learning styles. Based on the highest score, each student is classified whether they belong to the Visual, Auditory, or Kinesthetic learning style tendency.

The results of classifying students based on their learning style tendencies can be seen in the following table:

**Table 1.3:** Learning Styles * SDLRS Crosstabulation

| Count | | | | | | |
|---|---|---|---|---|---|---|
| | | SDLRS | | | | Total |
| | | Low | Under Avergae | Average | Above average | |
| Learning Styles | Visual | 9 | 23 | 9 | 6 | 47 |
| | Auditory | 2 | 11 | 8 | 2 | 23 |
| | Kinesthetic | 1 | 4 | 2 | 2 | 9 |
| Total | | 12 | 38 | 19 | 10 | 79 |

Based on the picture above, it can be seen that the percentage of Visual learning style is 37.13%, the percentage of Auditory learning style is 18.17%, and the percentage of Kinesthetic learning style is 7.11%, so it can be concluded that the tendency of learning styles of 8th grade students of State Junior High Schools 14 of Yogyakarta and State Junior High Schools 15 of Yogyakarta is Visual learning style.

**Tabel 1.5:** Chi-Square Tests

|  | Value | df | Asymptotic Significance (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 3.774[a] | 6 | .707 |
| Likelihood Ratio | 3.681 | 6 | .720 |
| Linear-by-Linear Association | 1.200 | 1 | .273 |
| N of Valid Cases | 79 |  |  |

Chi-square or chi square test aims to determine the relationship between variables contained in rows and columns, the type of data used in the chi square test is categorical data or frequency data (Sutrisno, 2000).

Based on the results of the chi-square statistical test (chi-square = 3.774, df = 6, p = 0.707), it can be concluded that there is no significant relationship between "Learning Style" and "learning independence", meaning that students' learning styles, whether visual, auditory and kinesthetic, have no correlation with students' learning independence.

**Tabel 1.6:** Symmetric Measures

|  |  | Value | Asymptotic Standard Error[a] | Approximate T[b] |
|---|---|---|---|---|
| Interval by Interval | Pearson's R | .124 | .116 | 1.097 |
| Ordinal by Ordinal | Spearman Correlation | .135 | .112 | 1.194 |
| N of Valid Cases |  | 79 |  |  |
|  |  |  |  | Approximate Significance |
| Interval by Interval | Pearson's R |  |  | .276[c] |
| Ordinal by Ordinal | Spearman Correlation |  |  | .236[c] |
| N of Valid Cases |  |  |  |  |

Based on the data above, the symmetrical measure data shows a very weak and insignificant relationship between learning styles and SDLRS scores. The Pearson's R for the interval-to-interval relationship was 0.124, and the Spearman's correlation for the ordinal-to-ordinal relationship was 0.135, both indicating a very weak positive correlation. However, the estimated significance values for these correlations were 0.276 and 0.236 respectively, indicating that they were not statistically significant at the conventional alpha level of 0.05. This suggests that the observed correlations are most likely due to random chance and not due to an actual relationship between learning styles and SDLRS scores.

In addition, the Chi-Square test results showed that the relationship between learning styles and SDLRS scores was not statistically significant. This further supports the conclusion that there is no strong relationship between the two variables. In summary, the statistical test results show that there is a very weak and insignificant relationship between learning styles and SDLRS scores. This suggests that the two variables may not be strongly related to each other.

## 5. Recommendations

Based on the results of the study, it is recommended that teachers make adjustments in using methods and strategies to facilitate student learning, to support students' learning independence, adjustments in teaching methods and strategies are needed to suit the diverse learning style tendencies among students. Teachers are expected to actively adjust their approach by taking into account the different learning styles of students, so that learning can be more effective and relevant to each individual's needs. Through these adjustments, learning objectives can be better achieved, and students are given support to develop independence in their learning process. By paying attention to learning style variations, teachers can create an inclusive learning environment, allowing each student to feel recognized and well facilitated in the achievement of learning objectives.

In designing learning in classrooms with students who have diverse characteristics, especially those with predominantly visual learning styles, teachers should consider several recommendations. First, it is important to present learning materials with strong visual support, such as pictures, diagrams or graphs, to facilitate the understanding of students with visual learning styles. In addition, teachers can integrate learning activities that involve the use of visual media, such as videos or interactive visual presentations, to enrich the learning experience. In this case, allowing students to draw or create concept maps can also be an effective approach. Furthermore, teachers can design tasks that incorporate visual elements to increase student engagement and ensure a thorough understanding of concepts. Providing options in assessment, such as visual projects or presentations, can give students the opportunity to express their understanding according to their visual learning style. This approach will help create a learning environment that supports students with diverse and predominantly visual learning style characteristics.

## 6. Conclusion

Based on research conducted at State Junior High Schools 14 of Yogyakarta and State Junior High Schools 15 of Yogyakarta, the data results presented in this paper reveal the distribution of learning styles among the participants, with visual learning style being the most common. Furthermore, statistical tests conducted showed that there was no significant relationship between learning styles and the level of SDLRS (Self-Learning Readiness Scale). In addition, the symmetrical measure showed no significant correlation between the two variables. It can be concluded that there is no significant relationship between students' learning styles (visual, auditorial, and kinesthetic) and students' learning independence. This study also found that students in grade 8th grade of State Junior High Schools 14 of Yogyakarta and State Junior High Schools 15 of Yogyakarta have a tendency to have a visual learning style, so there is a need for teacher adjustments in using methods and strategies in learning. In addition, it is also important to understand

learning objectives, student characteristics and student learning styles in designing learning, because by understanding individual characteristics, a teacher can adjust teaching methods, learning materials, and evaluation approaches to create a learning environment that suits student needs. This not only improves understanding of the material, but also builds students' intrinsic motivation, so that students can be more involved and active in the learning process.

**Conflict of Interest Statement**
The authors declare no conflicts of interest.

**About the Authors**
**Syahrir** is a postgraduate student in the master of educational technology program, Faculty of Education and Psychological Sciences, Yogyakarta State University, Indonesia.
**Fahrul Arfandi M. Nur** is a postgraduate student at the master of educational technology program Faculty of Education and psychology, Yogyakarta State University, Indonesia.
**Musdalifa As** is a clinical pharmacy student at Gadjah Mada University, Yogyakarta Indonesia who contributed to the writing of this article.
**Pujiriyanto** is a professor working at Yogyakarta State University, Indonesia. He researches learning technology, education, child development, self-directed learning and educational psychology.

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