

Synthesis of The Visual Auditory Kinaesthetic Model in Indonesia Higher Education

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ABSTRACT

This bibliometric study seeks to explore emerging opportunities and trends in research focusing on visual, auditory, and kinesthetic learning styles among students in Indonesia, utilizing the Vos Viewer tool. Employing bibliometric analysis, it gathers article data spanning from 2019 to 2023 via Google Scholar and the Publish or Perish 1,000 journal software application. The findings suggest promising avenues for future investigation into visual, auditory, and kinesthetic learning styles among Indonesian students, with potential developments across various domains from 2021 onwards. These include research subjects, learning style methodologies, and the practical integration of visual, auditory, and kinesthetic approaches in Indonesian educational contexts.

Keywords: *Visual model, Auditory model, Kinaesthetic model.*

1. INTRODUCTION

Education holds significant importance in mirroring the identity of a nation. It serves as a gateway to unlocking and nurturing human potential, thereby facilitating individual and societal development. Education should not only aim at improving the academic field but also pay attention to non-academic issues. Education is provided comprehensively for both the intellectual and personal development of the student (Irawati et al., 2021). Learning can take place anywhere, including participating in summer school activities or student exchange activities. The learning process is an activity that takes place in the learner's nerve center. A learning process can be observed if there is a behavior change that is different from before. The behaviour in question is that there are three behaviours in the learning process, namely cognitive behaviour, affective behaviour, and psychomotor behaviour (Nuralan Sitti et al., n.d.)

Understanding learning styles is crucial for enhancing performance in various settings such as work, school, and interpersonal interactions. Awareness of one's own and others' information processing methods enables effective communication. Learning style pertains to an individual's capacity to comprehend and assimilate lessons, encompassing a spectrum of speeds ranging from rapid to gradual acquisition of knowledge. (Utomo, 2022)

(Yuwanita et al., n.d.) Learning styles are habits that reflect the way we interact with the experiences and information we receive. Everyone has a different learning style. Not everyone follows the same path. Although each has differences, researchers can categorize them.

Various learning styles exist, each characterized by distinct traits. Rudini & Agustina (2021) elucidate three primary modes of learning styles: visual, auditory, and kinesthetic. Visual learners gravitate towards letters, images, diagrams, and tangible items, often favoring text and imagery for learning. Auditory learners prioritize learning through hearing, finding oral instruction particularly effective. Kinesthetic learners, as highlighted by Perumal et al. (2022), engage in learning through movement, preferring hands-on activities to absorb information.

Every student has their own distinct learning approach, one of which is the visual learning style. Individuals with a visual learning preference concentrate on visual cues for assimilation of information. To aid comprehension, it is beneficial for these students to be directly presented with tangible and realistic visual representations. (Yustitia & Juniarso, 2020)

The visual learning style involves learning by seeing and observing. More specifically, the type of visual learning is learning by looking at something, be it a photo or diagram, show, or video. Students tend to like learning and receiving information by watching and reading. After watching or reading, students find it easier and faster to process information and manage new information (Lestari & Djuhan, 2021)

(Cheng et al., 2019) One of the main characteristics of the visual learning style is the use of the eye sensory modality. This means that students understand, meaning concrete evidence that students must pay attention to first. Students with a visual learning style need to capture and understand information visually before they can comprehend it.

The auditory learning style is characterized by a preference for receiving information primarily through the sense of hearing (audio). Consequently, students who exhibit an auditory learning style excel in learning through methods such as lectures, tutorials, audio recordings, group discussions, and verbal explanations of material (Latanya Sianturi & Tuahman Sipayung, n.d. 2023). This learning style underscores the significance of the ear as a vital sensory organ, comprising structures such as the earlobe, ear canal, eardrum, cochlea, and semicircular canals. These components work collaboratively to transmit sound stimuli to the brain for processing into meaningful information. (Rambe Soleh Malim & Yarni Nevi, 2019)

Students who have an auditory learning style use hearing as the main tool to absorb and understand information. Individuals who have characteristics of an auditory learning style find it easier to receive and understand material through sounds and words. According to Hidayat, A. F. (2020), several characteristics of individuals with an auditory learning style are as follows: 1) All information can only be absorbed through hearing; 2) Have difficulty absorbing information in written form; and 3) Have difficulty writing and reading.

(Adawiyah et al., 2020), The kinesthetic learning style entails learning through movement and tactile experiences. Students with this learning preference thrive in environments that incorporate physical activities. They achieve success in learning when provided opportunities to engage with multimedia and acquire new information through interactive experiences. Individuals with a kinesthetic learning style typically prefer an active approach to learning and may find it challenging to remain seated for extended periods.

According to (Restianim et al., 2020), indicators of kinesthetics learning style. (1) Learning through physical activity. Students with a kinesthetics learning approach learn through movement, touch, and action. They can't stand listening to lessons for long and believe that they will learn better if they do some physical activity in the process. (2) Kinesthetics learning makes students more sensitive to expressions and body language because they practice body movements and body language while walking. (3) kinesthetics students who are physically oriented and move a lot usually have large muscle development initially. They also often use their fingers as pointers when reading, use a lot of body gestures, and enjoy practicing. (4) Likes to try new and irregular things. Students learn through practice and manipulation, possibly poor writing. (5) Weak in verbal activities. Tends to speak slowly, so needs to stand close when talking to other people.

The aim of this research is to see the development of research trends related to visualization, auditory and kinesthetics learning styles in Indonesian students so that it becomes a reference or point of reference for researchers in determining the themes to be taken, especially in the field of "Synthesis learning styles, visualization, auditory and kinesthetics learning styles in Indonesian students."

2. METHODS

This research method uses bibliographic analysis and bibliographic visualization methods. The structure of the research era is described through bibliographic visualization techniques according to (Narayani et al., 2023). Descriptive bibliometric is the method used in this research, which analyses literature to determine its characteristics. Qualitative methods were used in this research to compare information obtained through Google Scholar searches. The method is based on a search of articles developed using bibliometric analysis. Data were collected using Publish or Perish (PoP) and visualized using VOS viewer (Maulani Soraya & Muhammad, 2023). The keywords visual, auditory, and kinesthetic learning styles were entered in the search year 2019-2023, with a maximum number of results of 1,000. This search powers on the database of articles indexed by Google Scholar. The open-source nature of the database led to the choice of Google Scholar as the search engine.

To achieve the objective of this study, the researchers used the Publish or Perish application as a means of searching for publications. The process of searching data for articles published by Google Scholar using Publish or Perish has been explained in previous research (Patricia, 2021). This study was carried out according to the following steps: 1. Collect publication data using Publish or Perish application, 2. Process bibliographic data of registered articles using Microsoft Excel application, 3. Perform computer directory mapping of published data using VOS Viewer application, 4. Describe the results of computer map analysis. VOS viewer is software for building and viewing network directories. These bibliographic networks have the capacity to encompass individual journals, researchers, or publications, and can be constructed based on citations, bibliographic visualization, co-citations, or relationships between articles. VOS viewer additionally offers text mining capabilities, enabling the creation and visualization of networks or flows that map literacy from various sources. Network map visualization shows relationships and keyword groups in search. Overlay visualization used to identify year of implementation of related research topic (Alicia Sianipar, 2023)

3. RESULT AND DISCUSSION

3.1. Data Collection Results Publish or Perish

Based on the research process using the previous steps, researchers collected 510 research papers on the Visual Auditory Kinesthetics learning style related to students in Indonesia. Google Scholar is the source for this article, which was taken through a search and data collection process using the Publish or Perish application. Metadata is extracted from each article, which includes information about the article title, author, publication date, journal, number of citations, and associated URLs. The results of the collection on Google Scholar using Publish or Perish software from 2019 - 2023, there are 510 articles published about auditory learning style, kinesthetics learning style, visual learning style in learning outcomes, 4244 citations, 848.80 citations per year, 8.32 citations per article, 2.62 writings per article, with 31 H index, and 53 G19 individual H index, 3.80 annual H index, 17 hA index. Researchers took the 10 articles with the most citations.

Table 1. Publication Data

No	Author	Article Title	Years	Citation
1	Chetty, N. D S., Handayani, L., Sahabudin, N. A., Ali. Z., Hamzah, N., Rahman, N. S. A, & Kasim, S	Learning Style and Teaching Style Determine Students' Academic Performances	2019	190
2	Darmayanti, R., Sugianto, R., Baiduri, B., Choirudin, C., & Wawan, W.	Digital comic learning media based on character value on student' critical thinking in solving mathematical problems in terms of learning styles	2022	140
3	Ziatdinov, R., & Cilliers, J.	Generation Alpha: Understanding the next cohort of university student.	2022	80
4	HJ Leslie	Trifecta of Student Engagement: A framework for an online teaching professional development course for faculty in higher education	2020	70
5	N Khan, A Sarwar, TB Chen, S Khan	Connecting Digital Literacy in Higher Education to the 21st Century Workforce	2020	67
6	Mozaffari, H. R., Janatolmakan, M., Sharifi, R., Ghandinejad, F., Andayeshgar, B., & Khatony, A	The relationship between the VARK learning styles and academic achievement in dental student	2020	62
7	Hasanudin, C., & Fitriani, A.	Analisis gaya belajar mahasiswa pada pembelajaran flipped classroom	2019	46
8	B Widharyanto, H Binawan	Learning style and language learning strategies of students from various ethnics in indonesia	2020	45
9	NM Bokhari, M Zafar	Learning style and approaches among medical education participants	2019	33
10	E Kusumawarti, S Subiyantoro	The Effectiveness of Visualization, Audiotory, Kinesthetic (VAK) Model toward Writing Narrative: Linguistic Intelligence Perspective	2020	23

From the article data that researchers found, there was a list of 10 articles that researchers would screen using the criteria that researchers were looking for and researchers would exclude articles that did not match the screening criteria (Ajinegara & Soebagyo, 2022).

The research on learning styles among Indonesian students, published in journals indexed by Google Scholar, yielded a total of 510 articles on auditory, kinesthetic, and visual learning styles and their impact on learning outcomes from 2019 to 2023. In 2019, there were 95 articles published on Google Scholar. However, there was a slight decrease in 2020, with a total of 87 articles focusing on auditory, kinesthetic, and visual learning styles among Indonesian students. Subsequently, in 2021, there was an upsurge in publications, with 102 articles addressing these learning styles. The trend continued to rise in 2022, with 110 articles published. Finally, in 2023, the number of publications peaked at 116 articles, marking it as the year with the highest number of articles published on auditory, kinesthetic, and visual learning styles among Indonesian students.

3.2. Development of Scientific Publishing

Mapping the results of the development of scientific publications on auditory, kinesthetic and visual learning styles for students in Indonesia from 2019 to 2023, using the binary method with a minimum number of words displays of 10 out of 2360 words and only 25 that meet the upper threshold, and eliminating 5 keywords. The total number of keywords relevant to "Auditory, kinesthetic and visual learning styles in Indonesian students" selected is 20 words which form 4 clusters. The visualization displays nodes (circles) that identify authors, and edges (networks) to indicate author relationships. In the network, the size of the circles indicates the number of variables being examined concurrently. A larger circle suggests a higher number of variables being considered simultaneously. (Narayani et al., 2023)

Each existing cluster shows the correlation between its keywords. Meanwhile, mapping visualization analysis consists of three parts with different functions and objectives: network visualization, density visualization, and overlay visualization.

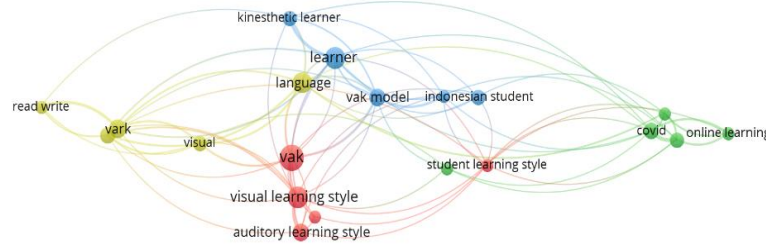


Figure 1. Output Path Diagram

1. Cluster 1 has 8 word items and is marked in red, namely the words Auditory learning style, Motivation, Student learning style, Vak
2. Cluster 2 has 11 word items and is marked in green, namely the words Covid, Kinesthetic Student, Online, Online learning, Pandemic
3. Cluster 3 has 8 word items and is marked in blue, namely the Indonesian words student, Kinesthetic learner, Learner, Performance
4. The Cluster 4 VAK model has 4 word items and is marked in yellow, namely the words Language, Read write, Style model, Vark, Visual

Figure 1 shows the relationship between concepts which are realized through interconnected images. Figure 1 shows evidence of the clusters, each of which is the most commonly studied cluster. Namely a study of students in Indonesia with auditory, kinesthetic and visual learning styles. From the network visualization cluster, research on auditory, kinesthetic and visual learning styles shows that learning outcomes can be divided into several main keywords: vak, visual learning style, auditory learning style, kinesthetic style, vak model, covid.

3.3. Learning Styles framework

This overlay visualization displays trending topics and searched keywords over a certain period of time. Based on the visualization, research on auditory, kinesthetic and visual learning styles among students in Indonesia shows an evolution of topic focus which changes over time. From 2019 to 2021, research on auditory, kinesthetic and visual learning styles among students in Indonesia focuses on student development and various learning styles such as auditory and kinesthetic. Trends Emerging in 2021-2023 Vak Research, Indonesian Students, Covid, Pandemic, and Online Learning.

According to (Fitria et al., 2022) Based on density visualization, the repetition of keywords in research papers increases along with the brightness of the yellow color and the size of the circle around it. Based on the density visualization obtained by researchers from VOSViewer, the text "Vak, Vark, Learner, Visual Learning style, Auditory Learning Style" has the yellowest and widest color, so this topic is usually used for research purposes. Conversely, the closer the color is to the background color, the less research there is on this topic. There is quite intensive discussion in research regarding the terms vak, auditory learning style, visual learning style, and kinesthetic learning style.

Tabel 2. Variable

Variabel	Sub Variabel
Vak	Style Model, Language, Visual, Learner,Indonesia Student,Motivation
Visual Learning Style	Learner, Indonesia Student, Kinesthetic Style, Learning Style, Visual, Vark
Auditory Learning Style	Style Model, Motivation, Learner, Performance, Learning style
Kinesthetic Learning	Read Write, Language, Learner, Performance

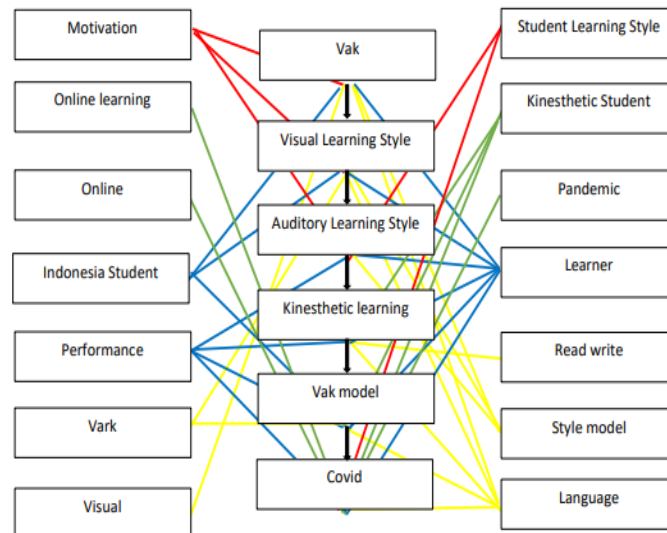


Figure 2. Framework

CONCLUSION

The research, aimed at dissecting research topics related to visual, auditory, and kinesthetic learning styles among Indonesian students through bibliometric analysis, indicates that investigations into these learning styles can further evolve across various domains beyond 2021. This includes the exploration of research subjects, learning style methodologies, and the practical application of visual, auditory, and kinesthetic learning styles within the Indonesian context.

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