Rethinking Engagement: VAK Learning Style Responses to Flipped Classroom Environments

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ABSTRACT

This study aims to investigate the impact of the flipped classroom method on students' learning engagement, especially visual, auditory and kinesthetic learning styles, considering their learning styles such as visual, auditory, and kinesthetic (VAK). Specifically, it compares students' engagement levels when learning occurs at home versus in the college classroom. Using a mixed-methods design, data were collected from 30 college students (aged 18-24) through a questionnaire consisting of 14 closed-ended and 1 open-ended question. The findings revealed that visual learners showed consistent positive engagement in both settings, with a preference for visual materials that supported their learning. Auditory learners demonstrated higher engagement during in-class sessions with live discussions, while kinesthetic learners exhibited higher engagement during hands-on activities in the classroom. The findings suggest that the flipped classroom model is particularly effective for visual learners, both at home and in the classroom. This research provides implications for educators to design inclusive flipped classroom experiences by incorporating learning media and activities tailored to diverse learning styles, ensuring effective engagement both at home and in the classroom.

Keywords: *college students; flipped classroom; learning styles; VAK*

INTRODUCTION

Modern education faces the demand for innovative and effective learning models that suit students' learning needs. One of the learning methods that gaining popularity is the flipped classroom, a model that promotes active learning by combining independent learning at home and practical application in the class. This method changes the traditional learning approach by placing self-learning activities before face-to-face classroom sessions. In other words, the flipped classroom model involves shifting traditional learning activities,

where tasks typically completed during class are assigned as homework, and activities commonly done as homework are tackled during class (Bergmann & Sams, 2012). At home, students study teacher-provided materials and complete readings or other learning activities as their primary source of knowledge. At school, students expand their knowledge through practical tasks (Tacer et al., 2021). In addition, they are also guided to engage in learning activities where they apply knowledge with the help of teachers or peers (Hwang et al., 2019).

The flipped classroom learning method is widely acknowledged for its potential to increase student engagement. By transforming the teacher's role into a facilitator, the method allows for more interaction between students and teachers, and encourages collaborative learning among peers Bergmann & Sams (2012). When applied appropriately, the flipped classroom method can increase student engagement, improve the quality of learning materials, utilize the knowledge students already have, and demonstrate the importance of knowledge for their current and future lives. It also encourages interaction, teamwork, and the application of concepts in a real-world context, all of which are elements that students want in their learning process (Tacer et al., 2021).

According to Fleming in Nidhi & Helena (2017), the VAK model, which stands for Visual (V), Auditory (A), and Kinesthetic (K), is among the most frequently utilized frameworks for categorizing learning styles. The visual learning styles involves understanding and processing ideas, concepts, data, and information through the use of images or visual representation. In Fleming's VAK model, this style involves students who prefer to see information and instructions rather than hear them. They tend to forget what they only hear, but remember well through visualization, such as pictures, diagrams, or personal notes. Visual students like to write, draw, take notes, and use colors to help understand and remember information. Auditory learners, on the other hand, understand information better through hearing. They rely on their listening and speaking skills to learn, so they understand verbal instructions more easily than written ones. Auditory students like discussions, lectures and question and answer sessions and often use their speaking skills to repeat information. Meanwhile, the kinesthetic learning style involves learning through physical activity or hands-on practice. These students learn by trying, preferring experiments or practical activities rather than listening to lectures or reading. They tend to be active, have good eye-hand coordination and are able to remember information through their body movements (Nidhi & Helena, 2017). These variations in learning styles demand special attention in the application of the flipped classroom method, especially regarding the way the material is presented and the form of interaction inside and outside the classroom. In this

case, the use of learning methods to the creativity of using technology-based learning media certainly has a great influence on the learning process for students (Fernandez et al., 2022).

In addition, the place of learning activities can influence how students engage with the flipped classroom method. At home, students rely heavily on passive materials such as videos and readings, which may not be suitable for auditory or kinesthetic learners who require verbal interaction or physical activity. In contrast, the classroom offers opportunities for live discussion, hands-on practice, and social learning, providing better engagement for these types of learners.

There are several previous studies that form the basis for this research. The first research was conducted by Puan Azchira Yazid, Edi Suprayetno, and Maitri Rahmadhani (2024) from the English Education Study Program, STKIP Al Maksum Langkat. The research was entitled *"The Effect of Flipped Learning Method on Students' Speaking of Auditory and Visual Learning Styles at Vocational High School".* This research investigates the impact of the flipped classroom model on the speaking abilities of students with visual and auditory learning preferences at SMK Al Maksum Stabat, while also comparing its effectiveness between these two groups. Employing a quasi-experimental method, the study involved 58 participants chosen through purposive sampling from a total of 446 students. The findings revealed that the flipped classroom method significantly enhanced speaking performance in both groups. Students with visual learning style showed an average improvement of 9.64 points, whereas those with an auditory style improve by 7.22 points. Furthermore, the comparison of mean scores indicated that the method had a slightly stronger effect on visual learners. The study concludes that the flipped classroom model is an effective strategy for enhancing speaking skills, with a marginally greater advantage for visual learners compared to auditory learners.

The second study was conducted by Mojtaba Tadayonifar and Mahnaz Entezari (2020) from Kashmar Higher Education Institute, Iran, entitled *"Does Flipped Learning Affect Language Skills and Learning Styles Differently?".* This study aims to evaluate the effectiveness of flipped learning method in improving language skills as well as analyzing the suitability of learning styles that are more optimal for this method. The study involved 40 Iranian EFL (English as a Foreign Language) learners who took the PET test as a pre-test, then were grouped based on their learning styles. After applying the FL method for one semester, paired samples T-Test results showed a significant improvement in students' proficiency in the post-test. One-way ANOVA analysis revealed that visual learning style showed better results than other learning styles. In addition,
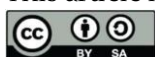
Mixed ANOVA found that the most significant difference in improvement occurred between speaking and writing skills. This study concluded that the flipped learning method significantly improved language skills, especially in students with visual learning styles, with the greatest impact on speaking skills.

The last research was conducted by Hasanudin & Fitrianingsih (2019) from IKIP PGRI Bojonegoro with the title *"Analysis of Student Learning Styles in Flipped Classroom Learning"*. This research investigates students' learning styles in reading skills courses that implement the flipped classroom model. Adopting a qualitative method, the study involved 35 first-semester students and lecturers teaching reading skills courses. Data collection was carried out through classroom observations and open-ended interviews. During the observations, the researcher documented detailed learning activities in the form of field notes. The interviews utilized open-ended questions to allow participants to respond openly. The findings revealed a variety of learning styles among students, with 28.6% identified as visual learners, 22.9% as auditory learners, and 22.9% as kinesthetic learners. This study concludes that flipped classroom can accommodate various learning styles of students, thus supporting a more effective and adaptive learning process.

The difference between the author's research and some previous studies lies in the focus of the study. While these studies provide important insights, they largely focus on performance outcomes or descriptive identification of learning styles. Few have critically examined how engagement varies not only across learning styles, but also between home and classroom environments within the flipped model. This gap forms the basis for the present study, which aims to explore how students with visual, auditory, and kinesthetic learning styles respond to the flipped classroom method in different learning contexts.

Therefore, this research is important to understand how students' learning styles affect engagement in the flipped classroom model when learning occurs at home versus in the classroom. It specifically aims to evaluate the engagements levels of college students aged 18-24 with different learning styles in both contexts. By filling this gap, the study seeks to support educators in developing more inclusive and adaptable flipped learning strategies that accommodate students' varying needs. This study is limited by the relatively small sample size, which may not represent the broader population. Additionally, as the data relies heavily on self-reported questionnaires, there is potential for bias due to participants' subjective perceptions and social desirability.

METHOD

This research uses a mixed-methods design that combines qualitative and quantitative aspects, incorporating philosophical assumptions and the application of these methods in an integrated study (Rofiqoh & Zulhawati, 2020). The data collection technique was carried out through a survey in the form of a questionnaire. Sugiyono (2017, p. 142) defines a questionnaire as a technique with a series of questions to answer. The participants in this study consisted of 30 college students with the criteria; (1) Students from a university with the age of 18-24 years, (2) They have applied the flipped classroom method in learning, (3) They know their type of learning style either visual, auditory, or kinesthetic. The data were collected by distributing 15 close-ended questions and 1 open-ended question. The first seven question focused on the implementation of the flipped classroom at home, and the second seven questions focused on its implementation in the classroom. Both sets of questions used a Likert Scale with five indicators: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree, to measure the alignment of students' learning styles with the flipped classroom approach in both environments. Additionally, the open-ended question allowed participants to share their personal experiences with the flipped classroom method.

The questionnaire was reviewed for clarity and relevance to ensure that the questions were easily understood by the participants. The researchers made minor adjustments to the wording and structure of the questions based on the feedback to enhance participants comprehension and ensure that the questions aligned with the research objectives. The open-ended responses were analyzed manually by reading through the answers and identifying common patterns that highlighted students' experience with the flipped classroom method and how it related to the learning styles.

FINDINGS AND DISCUSSION

The implementation of the flipped classroom method both at home and at in the classroom results in varying levels of student engagement, depending on the students' learning styles. Below are the results of the research on the implementation of flipped classroom at home and at college.

The Implementation of Flipped Classroom at Home

Table 1. Survey Results for the Suitability of Flipped Classroom Implementation at Home

Learning styles	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Visual	31.43%	57.14%	11.43%	
Auditory	5.71%	42.86%	37.14%	14.29%
Kinesthetic		52.86%	44.29%	2.86%

Based on the table above, student engagement in the flipped classroom at home varies significantly across learning styles. Visual learners demonstrated high levels of engagement when the flipped classroom was implemented at home. On the other hand, students with visual learning styles showed a very positive response. A total of 31.43% students strongly agreed, 57.14% agreed, and 11.43% were neutral indicating that the visual content such as videos, diagrams, and slide presentations captured their attention and helped them stay cognitively engaged. The ability to revisit materials at their own pace contributed to their sense of control and readiness for class. As Kristanto (2016) states, "Students who have a visual learning type will benefit more if learning uses visual media, such as pictures, diagrams, videos, or movies." This statement reinforces the finding that visual students find it easier to understand the material by using visual media that suits their needs. Their behavioral engagement was also evident as they actively reviewed the video in the preparation for class, which enabled them to apply the theories effectively during in-class learning activities.

Auditory learners showed mixed levels of engagement in the home-based flipped learning setting. While 42.86% of auditory students agreed that the method was suitable, 37.14% were neutral and 14.29% disagreed. These students often rely on spoken words and verbal interactions to process information. The lack of real-time conversations and limited auditory simulation from the video materials reduced their engagement. Hijriati et al. (2024) states that "Auditory learners tend to be more effective in remembering information when it is delivered orally or in audio form, such as lectures or conversations." In this case, many auditory learners found it difficult to stay focused and felt disengaged without opportunities for live discussion or feedback.

Kinesthetic learners reported the lowest engagement with the implementation of the flipped classroom at home. A total of 52.86% of them were neutral, 44.29% disagreed and 2.86% strongly disagreed on the compatibility of this method. While some may have appreciated the flexibility, the passive nature of watching videos did not provide sufficient physical involvement, leading to low behavioral and emotional engagement. According to Hijriati et al. (2024)

"Kinesthetic learners tend to understand information through physical action, movement, and direct experience. They will remember lessons better if they are involved in physical and practical activities and when they have the opportunity to experiment or interact with learning materials directly." The home environment lacked interactive, movement-based learning tasks, which are critical for keeping kinesthetic learners engaged.

The Implementation of Flipped Classroom at College

Table 2. Survey Results for the Suitability of Flipped Classroom Implementation at College

Learning styles	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Visual	24.29%	67.14%	8.57%		
Auditory	5.71%	45.71%	37.14%	11.43%	
Kinesthetic	17.14%	58.57%	24.29%		

Compared to the home setting, the flipped classroom implemented in the classroom setting obtained higher levels of students' engagement, especially for auditory and kinesthetic learners.

Visual learners remained consistently engaged during in-class flipped sessions. A total of 24.29% of visual learners strongly agreed, 67.14% agreed and 8.57% were neutral. They found that combining visual media at home with interactive learning in class supported deeper understanding. They in-class sessions allowed them to discuss or apply the visual materials they had already reviewed, enhancing both their cognitive and emotional engagement. Sutikno (2021) also supports this by stating that one of the benefits of using visual media is that it can increase the level of activeness or involvement of students in learning activities.

Auditory learners reported increased engagement during in-class flipped sessions compared to home-based learning. A total of 45.71% of auditory learners agreed and 37.14% were neutral. The classroom environment provided opportunities for live explanations, peer discussions, and instructor feedback, all of which are critical for auditory engagement. This is in line with Baroroh & Suyadi (2016) who stated, "With the discussion method, students will be directly involved with the material they learn so that students will easily remember what

they learn." This environment restored emotional and behavioral engagement for auditory learners who had previously felt disconnected during home-based learning.

Kinesthetic learners experienced a notable increase in engagement in the classroom setting. A total of 17.14% strongly agreed, 58.57% agreed and 24.29% were neutral to the implementation of flipped classroom. This percentage shows that when kinesthetic students can interact directly with the material through practical activities in class, they feel more involved and gain greater benefits. This is in line with the findings in the study by Gilakjani (2012) who stated that "Students with kinesthetic learning styles understand the material better through active participation, stimulation, and physical involvement during the learning process in the classroom". Thus, the flipped classroom method can still provide benefits for students with kinesthetic learning styles if classroom learning involves activities that allow them to learn practically.

Analysis of Flipped Classroom Implementation Based on Open-Ended Questions

The open-ended responses provided richer insights into the types of engagement students experienced in the flipped classroom. The answers given by each student showed different views based on their learning styles, whether auditory, kinesthetic or visual learning styles. The use of flipped classroom has a significant impact on their learning experience, which is expressed through their own statements.

Students with visual learning styles responded very positively to the implementation of the flipped classroom, both at home and in the classroom. They appreciated the opportunity to learn at their own pace using visual material provided by the lecturers, which they found conductive to comprehension and note-taking. One visual learner expresses that "Seeing the visual presentation at home makes it easier for me to remember the material" and noted that classroom activities reinforced what was learned at home. This finding is further supported by Kristanto (2016) who affirms that visual learners gain significant advantages from multimedia-rich environments. In both settings, visual learners-maintained engagement due to the alignment between their learning preferences and the flipped classroom method, indicating that the flipped model is very suitable for visual learners.

Auditory learners valued the repetition offered by the flipped classroom method, particularly when accessing video materials at home. However, they also expressed a strong need for interactive elements. Several students highlighted that while listening to the learning materials multiple times was

beneficial, the absence of real-time discussion limited their engagement. One respondent with auditory learning style stated, "This method helps me hear the explanation more than once because I can repeatedly access the learning materials, but I feel there is a limitation because there is no direct opportunity to ask questions when studying at home. I need interactive discussions to expand my knowledge. Therefore, flipped classroom will be more suitable for my learning style." This response shows that auditory students prefer learning that provides space for them to discuss so that they can gain a lot of knowledge based on the results of active discussions. This is in line with the statement of Bergmann & Sams (2012, p. 13) who note that a limitation of the flipped model is students' inability to ask immediate questions, which may hinder auditory learners' cognitive engagement. However, in the classroom, auditory learners responded more positively, as the environment allowed live discussion and collaboration learning, this meeting their engagement needs.

Kinesthetic learners displayed low engagement when learning occurred solely through passive means, such as watching videos or learning the materials at home. They reported that understanding was limited without the opportunity to physically interact with materials or participate in hands-on tasks. Students with kinesthetic learning styles also showed different views between the implementation of flipped classroom learning at home and at college. One of the kinesthetic students stated, "The learning videos at home are not enough to help me, but I feel more productive when learning through hands-on activities in class. I feel like I understand the material better through in-class activities because I can actively participate in the class. Overall, some parts of this method might match my learning style." This response emphasizes that engagement increased significantly when classroom activities involved movement and direct application. This supports by Gilakjani (2012) who argues that kinesthetic learners require physical involvement and sensory input for optimal learning. The findings suggest that the home-based portion of flipped classroom method should be supplemented with interactive or task-based components to support this learning style.

Based on the discussion above, the findings align with Kolb (1984) experiential learning theory, which proposes that individuals learn best when instructional methods are aligned with their preferred learning styles. This supports a constructivist perspective, where learning occurs through meaningful interaction with content in a contextual environment. Therefore, the lecturers should consider integrating more interactive components, such as discussions and hands-on activities, particularly for auditory and kinesthetic learners. Additionally, the use of visual media in the flipped classroom has
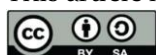
proven effective for visual learners. However, it is important to combine this approach with active classroom participation to further enhance learning outcomes. By tailoring the flipped model to accommodate different learning styles, lecturers can create a more inclusive and effective learning that maximize student engagement and retention.

CONCLUSION

The implementation of the flipped classroom showed different results based on students' learning styles, both at home and at college. Visual students showed consistently positive responses both at home and at college due to the use of visual media that they could access independently and in-class activities that further reinforced their understanding. Auditory students, while benefiting from this method, felt more connected to face-to-face learning that allowed them to discuss and listen to direct explanations. Meanwhile, kinesthetic students feel more engaged when learning is done at college involving practical activities, and find it boring to study the material at home as it does not suit passive learning. Therefore, it is important to consider students' learning styles when designing flipped classroom learning, by providing flexibility and providing learning tools that suit students' individual needs.

This study only involved learning style analysis based on the VAK model (visual, auditory, kinesthetic), so it did not include other learning style dimensions that may be relevant, such as the Felder-Silverman or Kolb models. The recommendations for future research can include more diverse learning styles and involve various levels of education. In addition, there needs to be research that develops more adaptive flipped classroom learning strategies to meet the needs of each learning style. The findings provide guidance to educators in designing flipped classroom learning that is more inclusive and responsive to students' needs. By providing diverse learning media and adjusting teaching methods according to students' learning styles, lecturers can increase students' engagement, both at home and in the classroom.

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REFERENCES

Baroroh, M., & Suyadi, B. (2016). Penerapan Metode Diskusi Berbantuan Media Audio Visual untuk Meningkatkan Aktivitas dan Hasil Belajar Siswa Kelas XI IPS 1. *Jurnal Pendidikan Ekonomi*, *10*(1). https://jurnal.unej.ac.id/index.php/JPE/article/view/3428

Bergmann, J., & Sams, A. (2012). *Flip Your Classroom: Reach Every Student in Every Class Every Day*. International Society for Technology in Education.

Fernandez, D. I., Nanning, & Jumrah. (2022). An Analysis of English Teaching Strategies Through Online Class During Pandemic Covid-19. *Inspiring: English Education Journal*, *3*(2), 133–143. https://ejurnal.iainpare.ac.id/index.php/inspiring/article/view/2705/1063

Gilakjani, A. P. (2012). Visual, Auditory, Kinaesthetic Learning Styles and Their Impacts on English Language Teaching. *Journal of Studies in Education*, *2*(1). http://dx.doi.org/10.5296/jse.v2i1.1007

Hasanudin, C., & Fitrianingsih, A. (2019). Analisis Gaya Belajar Mahasiswa Pada Pembelajaran Flipped Classroom. *Jurnal Pendidikan Edutama*, *6*(1). http://dx.doi.org/10.30734/jpe.v6i1.364

Hijriati, A. S., Rizaldi, D. R., Amrullah, Maryam, S. U., Nilwan, & Fatimah Ziadatul. (2024). Identifikasi Gaya belajar (Visual, Auditorial, Kinestetik) Pada Siswa MA Plus Nurul Islam Sekarbela. *ARJ*, *1*(1), 18–26.

Hwang, G.-J., Yin, C., & Chu, H.-C. (2019). The Era of Flipped Learning: Promoting Active Learning and Higher Order Thinking with Innovative Flipped Learning Strategies and Supporting Systems. *Interactive Learning Environments*, *27*(8), 991–994. https://doi.org/10.1080/10494820.2019.1667150

Kolb, D. A. (1984). *Experential Learning: Experience As The Source Of Learning And Development*. Prentice Hall.

Kristanto, A. (2016). *Media Pembelajaran*. Penerbit Bintang Surabaya.

Nidhi, S., & Helena, T. C. (2017). Styles of Learning VAK. *International Journal for Innovative Research in Multidisciplinary Field*, *3*(4), 17–24. https://www.researchgate.net/publication/317305325_Styles_of_Learning_VAK

Rofiqoh, I., & Zulhawati. (2020). *Metode Penelitian Kuantitatif, Kualitatif dan Campuran* (1st ed.). Pustaka Pelajar.

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. CV Alfabeta.

Sutikno, S. (2021). *Strategi Pembelajaran*. Penerbit Adab.

Tacer, B., Nagy, T., Marinensi, G., & Senden, R. (2021). *Flipped Classroom: Reinvent Your Teaching Practice*. STEP Institute.

Tadayonifar, M., & Entezari, M. (2020). Does Flipped Learning Affect Language Skills and Learning Styles Differently? *Sage Journals*, *17*(4). https://doi.org/10.1177/2042753020931776

Yazid, P. A., Suprayetno, E., & Rahmadhani, M. (2024). The Effect of Flipped Learning Method on Students' Speaking of Auditory and Visual Learning Styles at Vocational High School. *Journal IDEAS*, *12*(2). https://doi.org/10.24256/ideas.v12i2.5108