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IDENTIFYING LEARNERS LEARNING STYLES USING THE VARK MODEL

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ABSTRACT

Understanding students' learning styles and personality traits is essential for creating effective learning strategies tailored to their needs and enhancing their ability to learn independently. Learning styles encompass various aspects of human cognition, perception, behavior, and cognitive traits that influence how students acquire, process, and retain information.
To enhance the efficiency and effectiveness of educational interventions, educators must grasp each student's learning style and select teaching approaches that align with their individual characteristics. This not only enhances academic performance but also fosters student engagement, participation, and collaboration.
While numerous learning style frameworks have been proposed in research, the VARK model (Visual, Auditory, Read/Write, Kinesthetic) stands out as a widely utilized, practical, and easily applicable model. According to the VARK model, students are categorized into visual, auditory, reading/writing, and kinesthetic learners based on their preferred mode of information intake.
This research aims to identify students' learning styles, evaluate their impact on academic success, and explore avenues for optimizing instructional practices and enhancing learning outcomes.

KEYWORDS

Learning Styles, VARK Model, Visual Learner, Auditory Learner, Reading/Writing Learner, Kinesthetic Learner, Learning, Learning Methods

CITATION

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Introduction.

Each individual has their own unique learning style. In 1984, psychologist David Kolb introduced his theory of learning styles, which posited that a person's learning style is influenced by genetics, lifestyle, and experience. Learning styles are shaped by a person's decision-making approach and emotional orientation. Approximately 45% of men and 65% of women have an emotional orientation. The aim of learning should be to provide a clear structure that effectively conveys the type and depth of knowledge (R. Tyler, 1949). Throughout each stage of development, individuals continuously learn and enhance their ability to receive and process information (D. Kolb). This process involves four key activities: accumulating experience, engaging with reality, reflecting, and generating abstract ideas. Let's take a look at what types of learning styles exist in the following section.

1. Perceptual Learning style:

According to Vester (1975), our sensory organs develop differently from the very beginning. Among the various learning styles, the tactile or mnemonic style is well-known to teachers and students. Vester suggested that taking these styles into consideration in teaching can enhance students' learning achievement. He categorized tactile styles into three groups: auditory, visual, and kinesthetic. These styles are described as follows:

Visual learners have a strong memory and prefer reading and writing tasks over listening and speaking. They excel in remembering information they see, read, and engage with. Visual learners typically perform well in reading and writing activities and prefer structured and precise environments. They benefit from detailed explanations on the board and find visual aids such as graphics, diagrams, and presentations helpful in understanding concepts. Learning materials for visual learners include books, pictures, presentations, and videos.

Auditory learners are skilled in speaking and listening, excel in oral tasks, and have a strong ability to memorize information. They enjoy activities involving reading, speaking, and listening, but may be easily distracted by external noise. Listening exercises, conversations, and interviews are effective learning tools for auditory learners.

Tactile-Kinesthetic learners prefer hands-on activities and tasks that involve movement, such as games, drama, and hands-on projects, over traditional desk-based activities like reading, writing, or speaking. They may find it challenging and uninteresting to sit at a desk for extended periods in conventional teacher-centered classrooms.

2. Personality-based learning style:

Personality-based learning styles, as a psychological concept, are characterized by stability and remain consistent in various learning situations due to their connection to an individual's traits. Therefore, the style that reflects personality remains constant throughout life and is unaffected by external influences.

An extroverted learner enjoys social interactions and is attentive to their surroundings. They prefer studying with others, make decisions quickly, and are open to experimentation, learning through trial and error.

On the other hand, an introverted learner is reserved, prefers solitude for studying, and is more comfortable working alone. They are attentive listeners in group settings, value discipline, respect authority figures, and prioritize knowledge and skills imparted by teachers.

3. Cognitive Learning style:

Cognitive style, as previously mentioned, is a psychological concept discussed in this chapter regarding the importance of different styles in foreign language learning.

Predictive style: Individuals with a predictive or intuitive style exhibit creativity and explore various perspectives to understand reasons. They are imaginative, curious, and prefer to discover things on their own rather than rely on explanations from others. In conversations, they generate new ideas and are open to suggestions from others. They enjoy guessing and predicting unknown information.

Control or concrete style: Learners with a control or concrete style prefer clear instructions, order, and logical progression. They appreciate structured exercises provided by the teacher and follow instructions diligently. They find off-topic conversations distracting and rely on memorization. They focus on the present and are not inclined towards future-oriented thinking. They carefully read and follow instructions before using any materials.

4. Information Receiving Learning Style:

Global: Students with this learning style focus on grasping the main idea or general concept, often overlooking specific details. They prefer learning through discussions and interactions with others, emphasizing listening, speaking, and practical exercises. They tend to prefer concise answers over lengthy explanations and prefer working with an overview or general plan of the problem.

Analytic: Students with this learning style are comfortable with technical language and prefer learning with clear guidelines and detailed instructions. They pay close attention to the finer details of problems and prefer independent learning. They value their own understanding as well as the expertise of their teachers. They prioritize discipline and may take longer to form close relationships with others.

Accepted Learning Theories in Educational Research

Learning theories serve as the basis for understanding how individuals acquire, process, and retain knowledge. These theories have developed over years of research and continue to shape modern educational practices. This article explores ten widely accepted learning theories that have had a significant impact on contemporary education.

Behaviorism Theory emerged in the early 20th century through the work of pioneers such as B.F. Skinner, John Watson, and Ivan Pavlov. This theory views learning as observable behavior change explained through stimulus-response mechanisms. Behaviorists emphasize classical and operant conditioning, reinforcement and punishment systems, and the importance of repetition in habit formation. This approach focuses on external factors that influence learning rather than internal mental processes.

Cognitive Theory emerged as a response to the limitations of behaviorism, with Jean Piaget, Jerome Bruner, and Robert Gagné leading the way. Cognitive theorists suggest that learning is a mental process involving information processing, understanding, and memory storage. Key principles include the information processing model, schema formation and structuring, and metacognitive awareness. This theory highlights how learners actively process and organize information.

Constructivist Theory builds on cognitive principles, with contributions from Jean Piaget, Jerome Bruner, and John Dewey. Constructivists argue that learners actively construct knowledge by connecting new information with their prior knowledge and experiences. The theory emphasizes active knowledge construction, connection with prior experience, and situated learning in authentic contexts.

Social Development Theory, developed by Lev Vygotsky, emphasizes that learning occurs through social interaction and develops within cultural contexts. Central concepts include the Zone of Proximal Development (ZPD), social mediation, and collaborative learning. Vygotsky's work underscores the importance of social interaction in cognitive development.

Learning by Observation Theory, also known as Social Learning Theory, was pioneered by Albert Bandura. This theory explains how children learn by observing and imitating others, following social models. Key components include modeling, attention, memory and reproduction, and motivation. Bandura's research demonstrated that learning can occur without direct reinforcement.

Neuroscience and Brain-Based Approaches applications in education draw from researchers like Eric Kandel and Michael Gazzaniga, who study learning mechanisms at the biological level through brain structure and function analysis. This approach examines neural connections and plasticity, memory mechanisms, and the functions of different brain regions. Neuroscience provides empirical evidence for understanding how the brain learns.

Right Brain vs. Left Brain Theory, developed by Roger Sperry, suggests that the two hemispheres of the brain have different functions, with individuals tending to favor one side. According to this theory, the left brain handles logic, language, and mathematics, while the right brain processes creativity, arts, and spatial information. However, modern neuroscience has challenged the strict dichotomy of this theory.

Brain-based Learning Theory, promoted by Renate Nummela Caine and Geoffrey Caine, proposes that learning effectiveness improves when environments and methods align with the brain's natural functioning. This approach emphasizes creating safe and supportive environments, presenting

Multiple Intelligence Theory, developed by Howard Gardner, challenges traditional views of intelligence by proposing that humans possess multiple types of intelligence, each with its own learning approach. Gardner identified eight types of intelligence: linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic. This theory has significantly influenced differentiated instruction practices.

Learning Styles Theory, with contributions from David Kolb and Neil Fleming, suggests that each person has preferred learning styles with distinct strengths, requiring appropriate teaching methods. Common categorizations include visual, auditory, and kinesthetic learners, with Fleming's VARK model (Visual, Auditory, Read/Write, Kinesthetic) being widely recognized.

These learning theories collectively inform evidence-based educational practices. While each theory offers valuable insights, effective teaching often requires integrating multiple theoretical perspectives to address diverse learner needs. Contemporary educators increasingly recognize that learning is a complex process influenced by behavioral, cognitive, social, and neurological factors.

Understanding these theories enables educators to design more effective instructional strategies, create supportive learning environments, and accommodate individual differences among learners. As educational research continues to evolve, these foundational theories remain relevant while being refined and expanded through ongoing investigation.

The VARK learning style

The **DOMINANT** style in the learning process is determined by the following test/question/. This test is called the VAK model and was developed by Neil Fleming in 1987.

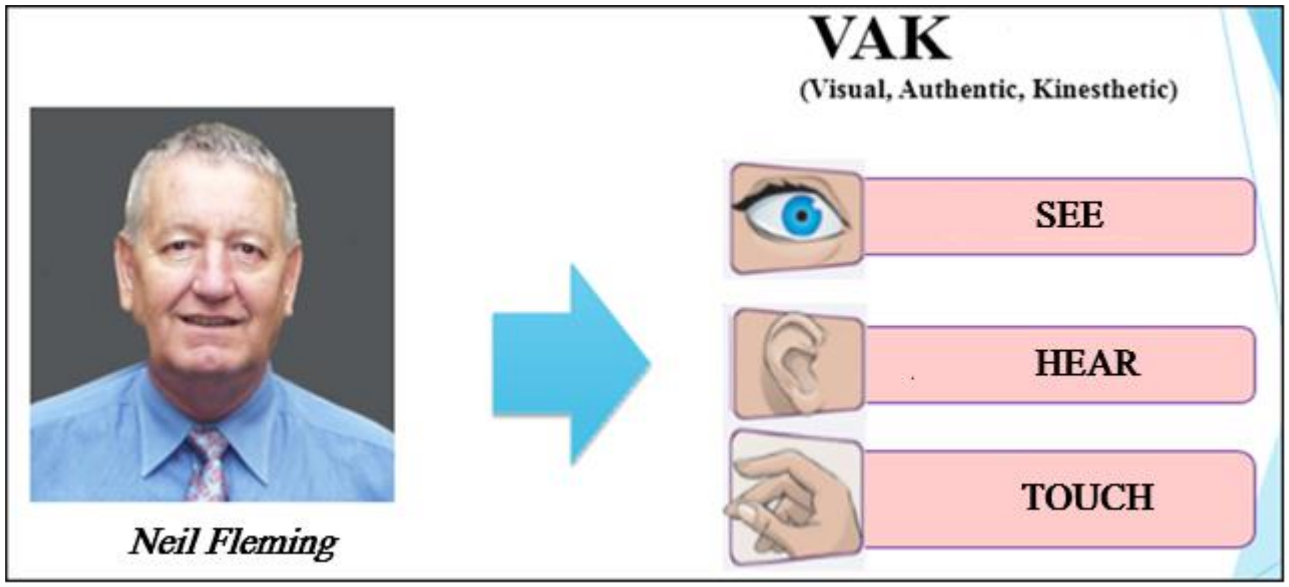


Fig. 1. *VAK model developed by Neil Fleming*

The VARK model provides a framework for identifying and addressing the individual learning preferences of students and encourages teachers to employ a variety of instructional strategies to cater to those diverse preferences.

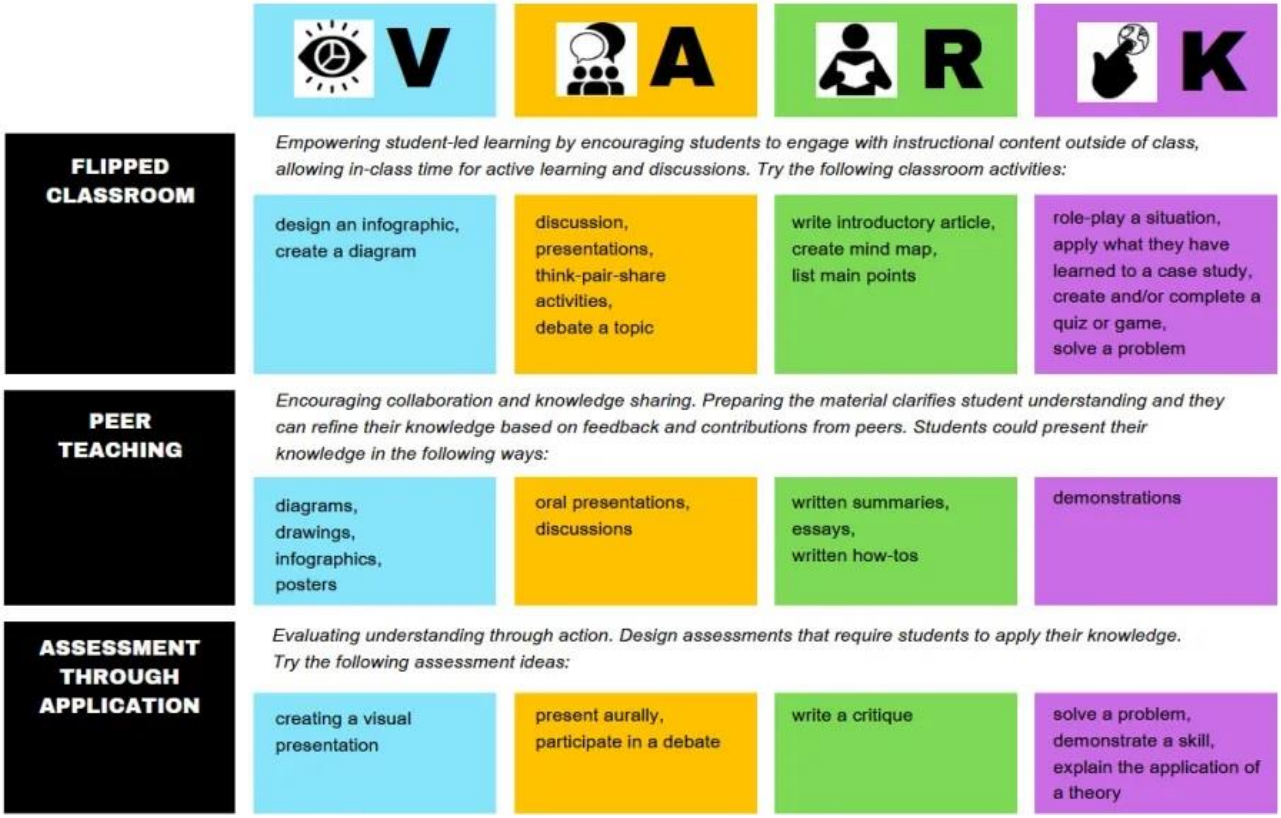
VARK introduces four modalities, (VISUAL, AURAL, READ/WRITE, and KINESTHETIC) for learning and communication preferences. Incorporating all four VARK® modalities into teaching practices will have observable benefits for student learning, which include:

Here are some examples of the ways that content can be presented using each of the four VARK modalities:

Visual learners, according to the VARK learning style, are individuals who learn best by seeing how something is done. They benefit from visual aids such as pictures and objects when learning new information. If your child is a visual learner, you can enhance their learning experience by incorporating visual materials into your teaching methods.

Visual learners process information more effectively through visual aids like graphs, charts, diagrams, and other visual representations. Here are some characteristics that can help you identify visual learners:

- Preference for visual materials: Visual learners prefer using visual tools to understand and retain information. They rely on visuals like graphs, charts, and videos to enhance their learning experience.
- Strong visual memory: Visual learners have a good memory for visual details and can easily recall information they have seen. They may remember specific images or illustrations from their learning materials.
- Interest in visual arts: Visual learners often enjoy activities that involve visual perception and creativity, such as drawing, painting, or photography. They may be drawn to art-related projects or electives.
- Observational skills: Visual learners have strong observational skills and can easily notice patterns, colors, and shapes. They may excel at finding specific information in visual documents or presentations. By recognizing these characteristics, you can better support visual learners in their learning journey and help them thrive in their educational pursuits.



[1]***Fig. 2.*** *The development of VARK learning model.*

Strategies for Visual Learners

For visual learners or those with visual learning preferences, here are some effective strategies to optimize the learning process:

Utilizing Visual Aids and Materials: Integrate visual aids like charts, diagrams, and images into your learning materials. These visuals aid in comprehension for visual learners. For instance, when exploring the water cycle, utilize a colorful diagram to depict the various stages and processes.

Creating Mind Maps: Develop a mind map to organize thoughts and establish connections between ideas. This visual tool assists in grasping the overall concept and interrelations among different elements.

Utilizing Color Coding: Employ color coding to emphasize crucial details, categorize content, and distinguish key concepts. Color coding aids visual learners in processing and retaining information more effectively.

Engaging in Storytelling: Incorporate storytelling activities using visuals like pictures, props, or videos to create a narrative that aligns with the lesson content. For example, when delving into historical events, utilize photographs or primary sources to visually narrate the story and evoke emotional connections.

Visual Reflection and Expression: Visual learners benefit from expressing their comprehension through visual mediums. Consider creating a visual presentation, image, or diagram to showcase your understanding. For instance, post-reading a book, you can craft a visual representation of a favorite scene or sketch a comic strip summarizing the key events.[2]

[1] Source of: https://vark-learn.com/what-does-effective-teaching-look-like/
[2] https://ithalisasyamimi.wordpress.com/2018/07/28/chapter-1-ready-to-learn-and-learning-style-inventory/

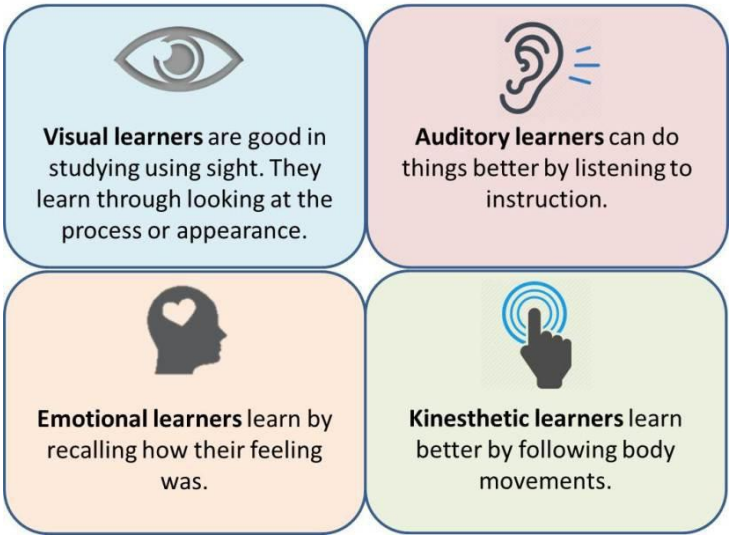


Fig. 3. *Characteristic of visual, auditory and kinesthetic learner*

Auditory Learners - VARK Learning Style

An auditory learner is someone who learns best through listening. These individuals can grasp information more effectively when it is presented verbally and can retain it better when they hear it spoken aloud. Therefore, when teaching a child, they are likely to learn more quickly if the information is explained to them verbally.

Auditory learners excel in listening and verbal communication. Here are some key characteristics:

- Prefer verbal instructions: They favor verbal instructions over written or visual materials and may seek clarification or discussion. They often ask for explanations to be given aloud rather than read silently.
- Strong listening skills: They actively engage in listening during lessons or conversations, showing attentiveness through eye contact, nodding, and responding.
- Enjoy participating in discussions: They enjoy expressing their thoughts, asking questions, and engaging in dialogue to deepen their understanding. In a classroom setting, they may eagerly participate in discussions and share ideas with their peers.
- Appreciate oral activities: They enjoy activities involving listening, such as audiobooks, podcasts, or storytelling. They actively seek out opportunities to engage with spoken content.

Learning strategies for auditory learners

If you are an auditory learner, you can enhance your learning experience by using the following strategies:

Participate in group discussions: Engage in group discussions, activities, or study groups where you can explain and discuss concepts with others. This verbal interaction can help reinforce your understanding of the material.

Utilize audio resources: Incorporate audio materials like audiobooks, podcasts, or recorded lectures into your learning routine. These resources provide auditory reinforcement of the material you are studying.

Read aloud: Reading aloud can help reinforce your comprehension of written text by combining visual input with auditory processing.

Use mnemonic devices: Utilize mnemonic devices, such as rhymes, acronyms, or jingles, to aid in remembering key information and concepts.

Reading/Writing Learners - VARK Learning Style

Students who are reading/writing learners learn best through written materials, note-taking, and creating written summaries. They often use textbooks, handouts, and written assignments to enhance their understanding. To identify reading/writing learners, observe the following characteristics and preferences:

- Reading Preference: They enjoy reading books, articles, and written materials to acquire knowledge and insight. They may spend their free time engrossed in books or feel enthusiastic when presented with written information.

- Strong Note-Taking Skills: They excel at taking detailed notes during lectures or study sessions. They meticulously record key points using bullet points, headings, and subheadings to organize their notes.
- Proficiency in Written Assignments: They perform well in writing tasks such as essays, reports, and writing projects. They can effectively research, analyze, and present information in written form.
- Memorization through Writing: They may find that writing down information aids in memorization and retention. They use rewriting or summarizing as a study technique to remember important details.

Strategies for Reading/Writing Learners

Below are effective strategies for reading/writing learners:

Highlighting and Underlining: While reading, highlight or underline crucial information to enhance focus and retention.

- Utilize colored highlighters or underline key phrases in textbooks or study materials.
- Develop Study Guides or Flashcards: Organize essential concepts and information in written form to actively engage with the content and reinforce comprehension. Include definitions, key terms, and examples in your study guide or flashcards.
- Utilize Writing Prompts: Incorporate writing prompts related to the subject matter to stimulate critical thinking and written exploration. These prompts can be in the form of thought-provoking questions, scenario-based prompts, or open-ended statements.
- Write a practice essay or journal entry: Practice your writing skills by writing an essay or journal entry on a relevant topic. This activity gives you the opportunity to express your thoughts, reflect on what you have learned, and strengthen your ability to effectively express your ideas in writing.

Kinesthetic learners -VARK learning style

Kinesthetic learners, according to the VARK learning style, acquire knowledge through active participation. For instance, teaching children through singing, playing games, and engaging in physical activities can facilitate their learning process. These learners require movement to maintain focus, and extended periods of sitting still can diminish their interest in learning.

- Kinesthetic learners prefer a hands-on approach to learning, benefiting from physical activity, movement, and direct experiences.
- To identify kinesthetic learners, observe the following characteristics and behaviors:
- Enjoy hands-on activities: Engage in activities involving physical movement, object manipulation, and practical application of concepts, such as science experiments, model building, sports, and physical exercise.
- Need for movement: Struggle to remain seated for prolonged periods, often fidgeting, tapping feet, or using gestures while learning. They may frequently change positions, walk around, or use hand movements to express themselves.
- Enhance learning through physical engagement: Retain information better when physically interacting with it, like reenacting historical events or using physical objects to demonstrate mathematical concepts.
- Use gestures and body language: Communicate thoughts and ideas through gestures, body movements, and facial expressions.

Learning Strategies for Kinesthetic Learners

Practical Activities: Engage in hands-on activities such as experiments, modeling, and physical tasks to directly experience the concepts being taught. For instance: Instead of just reading about chemical reactions in science class, conduct a hands-on experiment to observe and feel the changes happening.

Participate in sports or physical activities: Join sports or physical activities that involve coordination and movement to challenge and stimulate your learning style. For example: Try taking a dance class, playing a team sport, practicing yoga, or learning martial arts to enhance your learning experience.

Incorporate movement into learning: Integrate physical movement into your study routine by pacing while reading, using gestures to reinforce ideas, or arranging flashcards physically to make connections. For instance: When learning vocabulary, walk around while reciting the words or use hand movements to link meanings to each word.

Take physical breaks: Kinesthetic learners benefit from short breaks, so make sure to stretch, walk around, or do light exercise to stay focused and attentive.

What Is Your Learning Style?
(Research Sheet)

Please take a few minutes to fill out the questionnaire below to identify your learning style. Read the words in the left column and select the response that most closely matches you from the three columns on the right. Circle your chosen response. Add up the number of circled responses in each column and write the total score under that column. Your score on the questionnaire will help you determine your learning style.

Table 1. The questionnaire to identify your learning style.

	A	B	B
When I try to concentrate...	I start to get distracted by sounds and movements, and I start to notice things about what's going on around me that other people don't.	I am distracted by noise. I also try to control the volume and nature of the noise around me.	I can't stand being overwhelmed by restlessness or emotions.
When I imagine...	I see the image in my mind in clear detail.	I hear sounds in my thoughts.	I create animated images in my thoughts.
When I talk to others...	I find it difficult to listen to people talk for long periods of time.	I like to listen, or I don't like to talk much.	I use hand gestures a lot in my conversations.
Total points:	Identify by sight: _____	Listen and recognize:_____	To feel (to touch): _____

If you're main learning style is Visual:

- Use visual aids such as drawings, graphs, and descriptive texts. Try to visualize the topic and how it progresses in your mind.

If you're main learning style is Auditory:

- Listen to the words as you read them. Practice speaking the text in your own voice. Don't hesitate to read out loud.

If you're main learning style is Kinesthetic:

- Highlight important sentences and ideas. Keep a journal of the information in a corner of the book or on your notebook/computer. Write down your thoughts. Hold the book in your hand while reading instead of placing it on a table. Walk around while reading to keep both your mind and body engaged. There are various active learning methods that cater to different learning styles.

This study primarily focused on the VARK learning style model among various learning styles. Students in grades 10A and 10B at Secondary School No. 44 of the School, as well as students in grades 12A and 12B at the same school, were given a 12-question test to identify their learning style at the start of the lesson. The study yielded the following results.

10A			**10B**			**12A**			**12B**		
See	Hear	Touch	See	Hear	Touch	See	Hear	Touch	See	Hear	Touch
11	2	7	**10**	4	6	**10**	8	7	5	**12**	10

The students were split into groups of three. Groups 12A and 10A were formed based on learning style, while groups 12B and 10B were formed based on interests and preferences.

By learning style	12A	10A
At the request of the students	12B	10B

At the conclusion of the course, the students' scores were tallied and then compared to those of their peers in the same class and program.

Score	12A	12B	Score	10A	10B
A	11	3	A	10	6
B	14	9	B	4	3
C	-	9	C	3	1
D	-	4	D	1	6
F	-	2	F	3	4
Success	100	93	Success	90	80
Quality	100	44	Quality	70	45

Identifying the learning styles of students in grades 10A, 10B, 12A, and 12B according to the VARK model and tailoring lessons to their styles yielded the following outcomes:

- Enhanced student engagement and participation
- Improved comprehension and retention of lesson content
- Marked improvement in learning quality and grades, underscoring the significance of aligning teaching approaches with individual learning styles.

Conclusions

It is widely recognized in modern educational science that individuals have unique ways of acquiring knowledge and processing information. This study thoroughly explores the theoretical and practical foundations for identifying students' learning styles, understanding their differences and characteristics, and developing appropriate teaching methods tailored to each style.

The findings of the study indicate that students' learning styles vary not only in terms of sensory perceptual traits (visual, auditory, kinesthetic) but also in terms of psychological (extroverted, introverted), cognitive, and information-processing tendencies (global, analytical). These styles have been shown to significantly impact the speed of knowledge acquisition, depth of comprehension, active engagement in classes, and independent learning capabilities of students.

By recognizing their learning style and implementing learning environments and methods that align with their characteristics, students can:

- Acquire knowledge more effectively in a manner that suits them
- Enhance their capacity for independent learning
- Learn with self-awareness and satisfaction
- Facilitate accurate decision-making regarding their future career paths,
- Develop a better understanding of their role within a team setting.

To enhance the quality of education and deliver personalized learning experiences that cater to each student's needs, it is recommended to identify students' learning styles through research and analysis and align the curriculum and instructional approaches accordingly.

Thus, this study underscores the importance of accurately identifying learning styles and implementing adaptable and personalized learning strategies that cater to students' needs by educational institutions, teachers, and researchers to drive tangible advancements in the quality of learning and student development.

Recommendation

1. Consistently assess the learning styles of individual students and adapt teaching methods accordingly based on research findings.
2. Offer professional development workshops for educators on learning style theory and the VARK model to enhance their instructional strategies.
3. Promote the creation and utilization of teaching materials that cater to the diverse learning styles of students.
4. Customize group and individual teaching approaches to align with the specific learning preferences of students.
5. Educate students on identifying and managing their own learning styles to enhance their academic performance and critical thinking skills.

Conduct further research to evaluate the effectiveness of the VARK model in various educational settings and student populations.

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