

LEARNING STYLES AMONG STUDENTS WITH AUTISM SPECTRUM DISORDER (ASD)

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Abstract

Learning styles make the framework through which learners acquire knowledge and use their preferred approaches to process information in order to learn successfully. Like everyone who has their own preferred learning style individuals with autism have their own preferred learning style too. As autism is a communication disorder the special educators must be mindful of this fact and think of different way as to ascertain the learning styles of their autistic students.

Keywords: learning styles, autism spectrum disorder, VAK

Introduction

The brains of individuals with autism spectrum disorder (ASD) are wired differently. They perceive the world differently. They also learn differently. They can learn if they are taught the way they understand. So it is imperative to know the learning style of the autistic learner. Different learning styles are present among the neuro-typical population and so also among the autistic population.

Learning styles

Learning styles concepts show that learning has cognitive, affective and behavioral characteristics, based on seeing, interacting and responding to methods in learning. Based on

all definition that has been given, it can be summarized that learning styles are styles or individual learning technique that act with its environment, to process, interpret and obtain information, experiences or desirable skills. An individual's learning style is based on their preference when engaging in the learning cycle [1]. Like everyone who has their own preferred learning style individuals with autism have their own preferred learning style too. As autism is a communication disorder the special educators must be mindful of this fact and think of different way as to ascertain the learning styles of their autistic students.

VAK learning Style

VAK theory is considered to be one of the classical learning theories in the educational field. The VAK learning Style uses the three main sensory receivers (Vision, Auditory, and Kinesthetic) to determine a person's dominate or preferred learning style. According to the VAK model the best way of lesson planning for a successful class should ideally incorporate activities that facilitate all three learning styles to cater to the needs of all pupils. Walter Burke Barbe and colleagues proposed three learning modalities, identified by the acronym VAK [2]. The first evaluation for teachers is to find out if student learns better by hearing, seeing, or moving information as a part of processing it. Every person's learning style is either or a combination of auditory, visual, or kinesthetic (tactile) in terms of the way he or she learns best. No particular style is better than the others; it is all about what works best for the individual.

Visual learners:

These learners need to see the teacher's body language and facial expression to fully understand the content of a lesson. During a lesson or classroom the learners often prefer to take detailed notes to absorb the information. They learn through seeing. They tend to prefer sitting at the front of the classroom. They may think in pictures and learn best from visual displays including: diagrams, illustrated textbook transparencies, videos, flipcharts, interactive whiteboards, and hand-outs. Visual learners absorb information primarily by seeing it, or by visualising it mentally.

VAK learning styles: visual

- Are imaginative and can easily picture complex scenarios, images or ideas without reference
- Enjoy art, aesthetics and the written word
- Are excellent at spelling
- Take frequent notes
- Revise well using colour coordination, mind maps and flashcards
- Love graphs, maps, diagrams, flowcharts and written instructions
- May struggle with verbal instructions
- Find themselves easily distracted by visual stimuli such as sitting beside a window or being bombarded with pop-ups on a computer

Auditory learners:

They learn best through verbal lessons, discussions, talking things through and listening to what others have to say. Auditory learners interpret the underlying meanings of speech

through listening to the tone of voice, pitch, and speed. Written information may have little meaning until it is heard. These learners often benefit from reading text aloud and using a tape recorder.

VAK learning styles: auditory

Auditory learners absorb information primarily by hearing it. They:

- Love verbal instructions and follow them easily
- Are sensitive to tone of voice, pitch and rhythm
- Understand and process information by talking it through
- Would rather record a lesson or lecture than take notes
- Are good at oral presentations
- Learn better with music on, provided that it is not distracting
- Thrive in group and panel discussions
- Are easily distracted by auditory stimuli such as background noise or being spoken to

Kinesthetic learners:

Kinesthetic learners learn best through a hands-on approach, actively exploring the physical world around them. They may find it hard to sit still for long periods and may become distracted by their need for activity and exploration.

VAK learning styles: kinaesthetic

Kinaesthetic learners absorb information primarily through movement in a physical way. They:

- Are good at hands-on problem solving
- Are physically coordinated and good at sport
- Enjoy expressing themselves physically and may engage in performing arts or dance
- Struggle with overly abstract or conceptual topics
- Have a good sense of direction
- May learn by drawing and doodling
- Excel at practical subjects such as construction, cooking and engineering
- May be restless or fidgety in the classroom

The VAK looks at visual, auditory, and kinesthetic styles of learning and assesses and enhances multiple modalities of the learner.

Summary of VAK modalities according to Lisle, 2007 [3] are given in Table I.

Table I. Summary of VAK Modalities

Sl. No.	Modalities	Characteristics
1	Visual learners	Prefers images, diagrams, charts and other visual information
2	Auditory learners	Uses aural communication, sounds, dialogue, discussion, rhythmic patterns and reading materials
3	Kinesthetic learners	Active listeners, prefers practical tasks and activities

Learning styles among individuals with autism

Three styles of learning for Autism Spectrum Disorders emerged in the literature. These styles are

- a. Specialized Brains,
- b. Learning and Communication Styles, and
- c. Visual, Auditory, Kinesthetic Learning Styles (VAK).

There are two behavioral theories influencing learning; these theories are

- i. Theory of Mind Thinking (ToM) and
- ii. Positive Support Behaviors (PBS).

Dr Temple Grandin, professor of Animal Science at Colorado State University met hundreds of families and individuals with ASD and she has observed there are actually different types of specialized brains. Dr Temple Grandin who is herself autistic wrote in her book 'Thinking in Pictures' [4] which was published in 2006 that brains of autistic individuals fall under any of the three categories of specialized brain viz.

- a. Visual: They think in photographically specific images. Their long-term memory recall is usually better.
- b. Music and Math thinkers: They usually excel in math, chess, and computer programming. They notice patterns and relationships. Very often they play music by ear, are good with numbers, facts, and music.
- c. Verbal logic thinkers: They usually love history, foreign languages, weather statistics, and stock market reports. Their strong long-term memory is better than short-term memory recall. They are usually good with words, lists, and numbers.

Some individuals may have combinations of these categories. Dr. Grandin's categories provide detail about how a person thinks and processes information.

In 2009 a book ‘Students with Asperger syndrome: A guide for college personnel’ by Wolf et al it was stated that the learning styles “should not be goals in and of themselves, but should provide a [5] baseline, with the ultimate goal of enabling the student to independently apply the steps and procedures identified in each setting he may encounter.’ In this book two Learning and Communication styles were identified as given in Table II.

Table II. Learning and Communication styles. Source: Wolf, Brown, & Bork, 2009 [5]

Sl. No.	Learning Style	Communication Style
1	Verbal	Explanation and written
2	Visual	Demonstrations, flow chart and guides

Behavioral theories influencing learning for individuals with autism

Theory of Mind Thinking

Theory of Mind Thinking is the ability to perceive what is being said or interpret a situation from another person’s perspective [6-8]. Dr Grandin states that the “single most important aspect of functioning that determines the level of social success” is being able to perceive what another person is thinking [6]. Dr. Temple Grandin suggests four “cornerstones of social awareness” that aid in social thinking and functioning [6].

The cornerstones according to Dr Temple Grandin are:

- Perspective-taking – making sense of the world by understanding the differences in people’s emotions and thinking
- Flexible thinking – being able to accept change and being flexible to changing situations and knowing alternatives
- Positive self-esteem – having a “can-do” attitude to be successful in many situations
- Motivation – moving toward goals and understanding that things happen, yet striving to be successful.

Positive Behavior Support

The PBS model is a scientific functional behavioral assessment to identify what behaviors are problematic, create positive behaviors for those situations, and identify behaviors to use in the workplace when stressful or anxious situation arise. Despite good job training, attention to detail, a high degree of accuracy, and a dedication to work, people with ASD are frequently underemployed and serially unemployed [9]. The end goal for PBS according to Schall is a “replacement [of] behavior that will functionally replace the problem behaviour.’

Experiential Learning Theory and Learning Styles Inventory

The Experiential Learning Theory (ELT) and Learning Styles Inventory (LSI) were created in 1984 by Kolb [10] and were based on the works of Lewin, Dewey, and Piaget, with theories

that analyzed how experience plays a role in the learning process. The ELT combines "experience, perception, cognition, and behavior" [10]. The model was further developed with Dewey's model, which took into account the higher-order of learning such as impulses, feelings, and desires to create concrete experiences.

Piaget outlines the stages of learning through life experiences and how these experiences create meaning. According to Kolb Experiential learning occurs between the person and their environment where "learning is the process whereby knowledge is created through the transformation of experience." New and existing experiences create learning [1]. This knowledge helps shape a person's development. Based on this theory, Kolb developed the Learning Styles Inventory.

The Learning Styles Inventory is a four stage cycle based on the foundation of Lewin's model of training and feedback [1].

The four stages are

- a. concrete experience (CE),
- b. reflective observation (RO),
- c. abstract conceptualization (AC), and
- d. active experiment (AE)

As people engage in different types of learning and experiences, people will use different styles [10, 11]. The "four styles of learning that are associated with different approaches to learning: diverging, assimilating, converging and accommodating" [1]. The styles are a paired combination of the CE, RO, AC, and AE to make up the "approaches to learning" which are divergent, assimilative, convergent, and accommodating [1].

VARK

VARK is an acronym made from the initial letters of Visual, Aural, Read/Write and Kinesthetic. These four communication modes are used in learning. Learners use them when they are taking in, or giving out information. It is an expanded version of the VAK learning model. The VARK package, initially developed in 1987 by Neil Fleming [12], was the first to systematically present a modal preferences questionnaire with VARK Helpsheets for learners, teachers, employers, trainers, employees and others to use when communicating. Fleming's model also posits two types of multimodality.

These four communication modes are used in learning. Learners use them when they are taking in, or giving out information. People benefit from knowing about their individualized ways of learning. Even the exercise of reflecting about learning (metacognition) is a useful technique for improving our communication. VARK is a tool for any learning task.

- a. Visual learners prefer maps, charts, graphs, diagrams, highlighters, different colors, pictures, word pictures, and different spatial arrangements.

- b. Aural learners like to explain new ideas to others, discuss topics with other students and their teachers, use a tape recorder, attend lectures, and discussion groups use jokes.
- c. Read/Write learners prefer lists, essays, reports, textbooks, definitions, printed handouts, readings, web-pages and taking notes.
- d. Kinesthetic learners like field trips, trial and error, doing things to understand them, laboratories, recipes and solutions to problems, hands-on approaches, using their senses and collections and samples.

However VARK is not a learning style. A learning style is an amalgam of preferences and VARK is not a learning style because it is only one of the preferences that make up a learning style. VARK is the part that deals with perceptual modes, which means that it is focused on the different ways that learners take in and give out or express information. Learners have different learning styles, they learn in different ways and one preference in a learning style is the preferences for the intake and the output of ideas and information. VARK is a questionnaire that provides users with a profile of their learning preferences.

Conclusion

Managers and practitioners should be familiar with all the styles of learning, engage the employee through conversation and observe to see what their styles may be, and use assessments to determine the style preferences. Simply put, performance management has evolved over the course of the last decade to be a tool for addressing many different variables within the larger picture of human resource management, including learning and performance [13].

Learning styles make the framework through which learners acquire knowledge and use their preferred approaches to process information in order to learn successfully. It is very important to remember that as no one person uses one style of learning exclusively, but they do have preferred learning styles. It is therefore important to attempt to cater for all learning styles during lessons to enable the most efficient learning to take place.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this work.

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