

Styles of Learning Based on the Research of Fernald, Keller, Orton, Gillingham, Stillman , Montessori and Neil D Fleming

MR. SREENIDHI S K¹, MS. TAY CHINYI HELENA²

¹The Managing Director of Oscar Murphy Life Strategists, Bangalore, India

²The Executive Director of Oscar Murphy Life Strategists, Bangalore, India

Email - sree@oscarmurphy.com

Abstract: *This article helps the readers to understand the different learning styles like visual, auditory and kinesthetic, based on the research work of Fernald, Keller, Orton, Gillingham, Stillman , Montessori and Neil D Fleming. Learning styles are different approaches or ways of learning. Most people would have a preference to identifiable method of interacting with, taking in, and processing information. It involves personalizing the educating methods, particular to an individual that are presumed to allow that individual to learn best.*

This article explains the importance of Based individualized "learning styles" that originated in the 1970s. Learning styles are influenced by many factors such as individual experience, different intelligences and personality factors such as a preference for learning alone or in a group. Our learning style will influence how we cope with regular tasks in our life such as reading a map, reading book, a project plan etc. This article throws lights on the usage of this concept by students and adults to understand their learning style and use this knowledge to their advantage in order to excel in their life.

Key Words: *learning styles, visual, auditory, kinesthetic, interacting, processing information, personalizing education methods.*

1. INTRODUCTION:

Learning styles are various approaches or ways of learning. They involve educating methods, unique to each individual that are presumed to allow him/her to learn best. Most people prefer an identifiable method of interacting with, taking in, and processing stimuli or information. Based on this concept, the idea of individualized "learning styles" originated in the 1970s, and acquired enormous popularity.

Learning styles are influenced by many factors such as individual experience, different intelligences and personality factors such as a preference for learning alone or in a group. Our learning style will influence how we cope with regular tasks in our life such as reading a map or cooking a meal. A useful example to help understand this concept better is how we learn to use a new piece of technology. We can approach it either by sitting alone, reading instructions from beginning to end before or take a 'hands on' approach like pressing the different controls to discover through trial and error or learn by seeing others using the same. This example helps to reflect about how learning preferences vary among individuals. This said however, circumstances may also determine how each person learns something new.

Such examples help us to think about how we have preferences for the manner in which we learn. Thus, understanding learning styles approaches helps us to consider an individual's dominant or preferred way of thinking in turn helping us to learn better in lesser time.

2. HISTORY OF LEARNING STYLES:

Early History:

In the beginning, research focused on the relationship between memory and oral or visual methods. In 1904, Alfred Binet, a French psychologist, developed the first intelligence test, which spawned interest in individual differences. The study of learning styles was the next step: In 1907, Dr. Maria Montessori, who invented the Montessori Method of education, began using materials to enhance the learning styles of her students. Dr. Montessori believed that students do not demonstrate mastery of subjects through a multiple-choice answer sheet, but through their actions.

1950 to 1970:

The study of learning styles declined for approximately 50 years before re-emerging in the 1950s. The decline was due to the rise in emphasis on IQ and academic achievement. In 1956, Benjamin Bloom developed a system known as

Bloom's Taxonomy, which took another step toward defining learning-style differences. Further advancement was made when the Dunn and Dunn Learning Style Model was introduced in 1976, generating diagnostic instruments for evaluation.

1980 to Present:

From the 1980s to the present day, different learning-style models have been developed building on previous discoveries. In the '90s, the emphasis was placed on having teachers address learning styles in the classroom through adjustments in curriculum that incorporate each style, giving an equal chance for students to learn.

Recent History:

Pedagogy, which refers to the method of teaching according to learning styles, has been used to train teachers to accommodate different learning styles in the classroom. Since teachers are accustomed to teaching in their individual style, the move has been to introduce other styles into the classroom. With the introduction and increased usage of online courses, the importance of learning styles has grown; tests are administered to tailor courses to the individual.

Recent years have seen a change in the trends of education from pedagogy to andragogy i.e. from a teacher-centred learning to a student-centred learning. Therefore, it is not only desirable but also essential for educators to recognize that students have different learning styles and that they should tailor instructions to the characteristic ways in which they prefer to learn.

Theoretical Basis for VAK:

Since each of us has a natural preference for the way in which we would like to receive and impart information, this is largely determined by our genes. However, that being said, it is also susceptible to change/development, particularly when we are young (whilst our neural pathways are still being established). There are various ways in which preferred processing modes become apparent and some simple ways in which we can enhance the effectiveness of our communication once we are aware of them.

Learning styles classify different ways people learn and how they approach information. In more complex terms, some experts define different learning styles as the preferred processes students use when they learn, and some believe that, unlike intelligence, students' particular learning styles are fixed. In other words, students will find it easier to learn in their preferred learning style, and will find learning easier if the conditions are present to allow them to use their learning style.

One of the most common and widely-used categorizations of the various types of learning styles is Fleming's VARK model (sometimes VAK - an acronym for the Visual (V), Auditory (A), and the Kinaesthetic (K) sensory modalities) which provides the learners with a profile of their learning styles, based on the sensory modalities which are involved in taking in information. This model expanded upon earlier Neuro-linguistic programming (NLP) models. In NLP the senses are split into three groups (Visual, Auditory and Kinesthetic) which are referred to as Representational Systems (rep systems). This term relates to the fact the brain uses the senses to build our internal representation, or model of the world around us.

People commonly have a preferred learning style which may be a blend of all three senses. Some people have a very strong preference while others have an even mixture of two or three styles. When an individual knows his or her preferred learning style(s), he or she is able to understand the type of learning that best suits him/her. This enables him/her to choose the types of learning that work best.

Some people learn by seeing (Visual); some people learn by hearing (Auditory); some people learn by doing (Tactile/Kinesthetic). During childhood, each person advances through various stages of each style. Young children are all kinesthetic learners. Visual and auditory preferences emerge later. Each person is born with tendencies toward one main style. The dominant style may not always be the same, across different settings. It may vary or be combined with others, according to the nature of the activity.

3. CHARACTERISTIC PATTERNS OF EACH LEARNING STYLE:

All the three learning styles have their own set of characteristics which are presented below:

3.1 Visual Learning:

Visual learning is a teaching and learning style in which ideas, concepts, data and other information are associated with images and techniques. It is one of the three basic types of learning styles in the widely-used Fleming VAK/VARK model.

Prevalence:

Making up about 60%-65% of the general population, visual learners absorb and recall information best by seeing.

Characteristics of Visual Learners:

Individuals who prefer this style of learning are those who learn through seeing things. They prefer to see information & instructions and may forget information that has only been heard. With the ability to visualize, they tend to see pictures and images when they remember things and may use mind maps. They have a predisposition for writing, drawing, imagining and prefer to create their own notes and to read for themselves.

They have an inclination to see a concept as whole rather than individual parts. They benefit from seeing the aims and objectives of learning sessions or from understanding the purpose of the session. Relying heavily on their senses and enjoying working in groups where they observe non-verbal cues from colleagues, they learn through role play and watching others perform or demonstrate a skill. Moreover, they also tend to have good control over sign language.

While visual learners tend to be good at spelling, they may forget names. Preferring a less formal setting to learn, a traditional classroom environment may not be highly beneficial to them. They are usually organized and observant but can be distracted by movement of others when they are trying to concentrate. With a tendency to daydream while reading, they are likely to visualize what they are hearing. Visual Learners tend to be fascinated with colour and have the ability to understand complex maps, graphs and charts. Hence, they may use colour coding, diagrams and symbols to revise and help recall, or by re-writing pieces of text or other information in their own style.

Suggestions for Visual Learners:

- Write things down
- Jot down key points on post-it notes and display around the house
- Copy what's on the board
- Sit near the front of the classroom to see instructor clearly
- Write key words
- Create visual reminders of auditory info
- Use mind maps to summarize large tracts of information
- Take notes
- Make lists
- Watch videos
- Use flashcards
- Use highlighters, underlining, etc.

Preferred Test Styles for Visual Learners: Essays, Diagramming, Maps, Demonstrating a process

3.2 Auditory Learning:

Auditory learning is a learning style in which an individual learns through listening. An auditory learner depends on hearing and speaking as the primary style of learning. Auditory learners must be able to hear what is being said in order to understand and may have difficulty with instructions that are written. They also use their listening and repeating skills to sort through the information that is sent to them.

Prevalence:

Making up about 30% of the population, **auditory learners** absorb information best through the sense of hearing.

Characteristics:

They may struggle to understand a chapter they have read, but then experience a full understanding as they listen to the class lecture. They have the ability to follow verbal instructions readily and prefer to hear information rather than read it. With a tendency to adopt a theoretical style of learning, they need to understand small parts and the relationships between these parts in order to create a bigger picture and gain a deeper understanding. An auditory learner is skill oriented, memorizes tasks well and benefits from traditional styles of teaching /lectures/ question and answer sessions.

While they are able to orally communicate well, they may have difficulty communicating in written form. Auditory learners are good at writing responses to lectures they have heard. They are also good at oral exams and learn effectively by listening to information delivered orally, in lectures, speeches, and oral sessions. They may be reluctant to make their own notes or conduct personal research and may prefer delivering presentations to a written report.

Auditory learners tend to have a knack for ascertaining the true meaning of someone's words by listening to audible signals like changes in tone. When memorizing a phone number, an auditory learner will say it out loud and then remember how it sounded to recall it. They tend to recall accurately what has been spoken, but may gain little benefit from additional reading or writing out facts. They enjoy explaining their learning to others in the group and learn from discussion.

Proponents claim that when an auditory/verbal learner reads, it is almost impossible for the learner to comprehend anything without sound in the background. In these situations, listening to music or having different sounds in the background (TV, people talking, etc.) will help learners work better.

Suggestions for Visual Learners:

- Record class notes and then listen to the recording, rather than reading notes.
- Use audiotapes for learning languages.
- Remember details by trying to "hear" previous discussions.
- Participate in class discussions and group activities.
- Ask questions and volunteer in class.
- Read out loud.
- Repeat facts with eyes closed.
- Ask questions.
- Avoid auditory distractions.
- Whisper new information when alone or describe aloud what is to be remembered.
- Put information into rhythmic patterns, such as a song or poem.
- An auditory learner may also be benefited by using the speech recognition tool available on PCs.

Preferred test styles for auditory learners: Writing responses to lectures, oral exams

3.3 Kinesthetic Learning:

Kinesthetic learning is a learning style in which learning takes by the student actually carrying out a physical activity, rather than listening to a lecture or merely watching a demonstration. It is also referred to as **tactile learning**. People with a kinesthetic learning style are also commonly known as **do-ers**.

Prevalence:

Making up about 5% of the population, tactile and kinesthetic learners absorb information best by doing, experiencing, touching, moving or being active in some way.

Characteristics:

According to Fleming's learning style theory, students who have a predominantly kinesthetic learning style are thought to be natural discovery learners. They prefer learning by doing as opposed to having thought first before initiating action. With a tendency to prefer exploring concepts through experimentation, they may not benefit from learning by reading or listening. Moreover, such students need few verbal or written instructions and are confident in participating in hands on activities. Thus, kinesthetic learners would enjoy making things and learning through practical activities and learn best in a laboratory, workshop, gymnasium, simulated or real environments where they can be active.

The kinesthetic learner usually does well in things such as chemistry experiments, sporting activities, art and acting. They also may listen to music while learning or studying. It is common for them to focus on two different things at the same time. Kinesthetic learners' short- and long-term memory is strengthened by their use of their own body's movements. They will often remember things by going back in their minds and visualizing their own body's movements. They also have very high hand-eye coordination and very quick receptors.

In an elementary classroom setting, these students may stand out because of their constant need to move; high levels of energy which may cause them to be agitated, restless and/or impatient; fidgeting a lot but may be unaware of this and not distracted by their own 'fidgeting'.

Suggestions for Kinesthetic learners:

- Create a model.
- Demonstrate a principle.

- Practice a technique.
- Participate in simulations.
- Engage in hands-on activities.
- Study in comfortable position, not necessarily sitting in a chair.

Preferred Test Styles for Kinesthetic Learners: Multiple choice, short definitions fill in the blanks

4. METHODOLOGY:

PURPOSE OF THE ASSESSMENT

The VAK offers a relatively simple methodology and acts as a tool that aids in understanding the preferred learning style of an individual. It also helps people structure data in order to comprehend, recall and associate with new ideas.

TARGET AUDIENCE

The VAK Assessment is applicable and used by individuals from various backgrounds, with children below 8 years of age being an exception.

QUALITY OF THE ITEMS

The quality of the test is enhanced as it is an easy to use assessment with the items catering to a wide range of audiences. The items do not include any racial or gender stereotyped comments, while the interpretation and scoring of the test is simple and easily comprehensible. The derived test score is reliable, as the test is administered under standardized settings and extraneous variables such as test instructions and the test administrator have a minimal influence on the variation in test scores as these are standardized across situations.

The test also meets requisite practical aspects as it includes the following considerations:

1. The items are formulated in simple layman English
2. The test is legible (can be easily understood)
3. The test material is durable (does not change across time)
4. Is applicable irrespective of gender, race or culture

NATURE OF THE ITEMS

All the items in the questionnaire belong to the content domain which facilitate in assessing an individual's learning style. The 15 items in the questionnaire describe multiple situations in which an individual is most likely to respond in various environments through which his learning style will be displayed. The items are repetitive in a way so as to track the individual's response to certain stimuli which best predicts his learning style across situations. The items are standardized as they are the same for every respondent with respect to the content, form and order.

ASSESSMENT ADMINISTRATOR QUALIFICATIONS

The user needs to have an average of 2 years work experience in managing people, or a PG in Psychology/Sociology or an MBA.

SIMILARITIES AND DIFFERENCES WITH SIMILAR TESTS

Assessments such as the Index of Learning Styles (ILS; Felder & Silverman, 1988) and Kolb's Learning Style Inventory (Kolb, 1984) indicate an individual's preference for a learning style. The ILS focuses on preferences with respect to active/reflective, sensing/intuitive, visual/verbal, sequential/global learning styles while the Learning Style inventory assesses preferences with regard to Kolb's experiential learning theory. While the aforementioned tests identify an individual's preferred learning style, the VAK indicates the mode in which individuals learn best (Visual, auditory, Kinesthetic). For example, while an individual may prefer an 'active' learning style, he or she may employ that style best in the form of a kinesthetic mode/ learning-by-doing.

INSTRUCTIONS FOR THE TEST ADMINISTRATOR

- Make sure the subject is seated comfortably in a well-lit and ventilated room
- Build rapport with the subject, make him feel at ease
- Educate the subject on the confidentiality element of the test
- Give instructions of the test (as specified below)
- Reconfirm if instructions are clear and doubts to be cleared if any
- After test completion give instructions on the scoring methodology
- Interpret the scores and clear doubts that may arise

INSTRUCTIONS FOR TEST TAKERS

- In the given 15 questions, you are given 3 points for every set of 3 statements and all you need to do is to distribute the 3 points
- You can give (1,1,1) or (2,1,0) or (3,0,0). You need to allot points according to your preferences
- There are no correct or wrong answers; you just need to indicate your preferences

SAMPLE ITEM

1. When operating new equipment for the first time I prefer to:

- a) Read the instructions
- b) Listen or ask for an explanation
- c) Have a go and learn by 'trial and error'

SCORING OF THE TEST (FOR PAPER-PENCIL FORMATS ONLY, AS THE ONLINE SCORES ARE AUTO-GENERATED)

Each statement corresponds to one of the three learning mode preferences. There are 15 items for each learning style (i.e. Visual, Auditory & Kinesthetic).

Step 1: Add up the scores for all fifteen items for each learning styles (1, 2 and 3 which correlates with Visual, Auditory and Kinesthetic in a random manner).

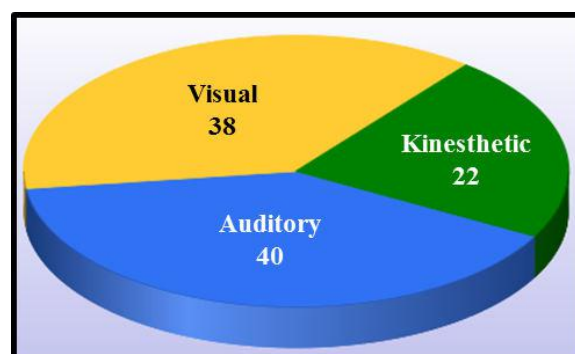
Step 2: Divide each score by 45

Step 4: Multiply each score by 100

Step 5: The total of all three learning style should add up to 100.

4. FINDINGS AND ANALYSIS:

The Visual-Auditory-Kinesthetic learning styles model, usually abbreviated to VAK, provides a simple way to explain and understand your own learning style (and learning styles of others) to assess your preferred learning styles, and most importantly, to incorporate learning methods and experiences that match your strengths and preferences. There is no right or wrong learning style. The fact is that there are different types of learning styles that suit different people.

Sample Report of “A”:

Learning preference: The subject primarily learns through information presented in the Auditory and/or Visual mode

Auditory:

- The subject would benefit from reading aloud, as he/she can hear his/her own voice and learn simultaneously
- Strong listening skills; he/she has the ability to easily grasp information when heard. Thus, can learn best through the classroom mode, wherein he/she can hear the teacher's lectures
- He/she displays the ability to pick up on sounds that others may miss out on
- Being sensitive to sound, he/she would be able to distinguish between changes in pitch, tone, etc.
- He/she prefers any material to be presented in the auditory mode, or supported with audio information

Visual:

- Information presented through visual aids such as books, notes, articles or write-ups would enhance his/her learning experience
- He/she exhibits the ability to create mental images with ease to support learning, visualizing pictures of texts when he/she remembers things
- He/she benefits from seeing the objectives of the lesson first or reading a synopsis/summary.
- He/she would enjoy reading and would much prefer having textual information being presented to him/her
- He/she is observant of environmental detail and would be able to pick up on cues that others may miss.
- He/she tend to learn best through role play and watching others perform or demonstrate a skill

Norms:

Norms are standard models or patterns regarded as being typical. A norm of one type or the other is a basic requirement of all tests. A norm-referenced test / NRT is a type of test, assessment, or evaluation which yields an estimate of the position of the tested individual in a predefined population, with respect to the trait being measured.

This estimate is derived from the analysis of test scores and possibly other relevant data from a sample drawn from the population of secondary school students. A cross sectional study was conducted on 810 randomly selected secondary school students (465 females and 345 males) who were enrolled in different schools across Singapore & India.

Reliability and Validity:

Establishing reliability, validity and norms of an instrument is extremely essential for any psychometric instrument as it ensures that the results are consistent with the person's true behavior. Therefore, the data collected through research enables one to establish sound psychometric properties of assessments, irrespective of the construct they are designed to measure.

Reliability:

Reliability refers to the consistency of a test, or the degree to which the test produces approximately the same results over time under similar conditions. Ultimately, reliability can be seen as a measure of a test's precision.

Validity:

Validity refers to the degree to which a test measures what it claims to measure. A test is valid to the extent that inferences made from it are appropriate, meaningful and useful. One of the methods of establishing validity is through construct validity, which refers to the ability of the instrument to measure a non-observable trait – in this case – learning modes. The results obtained from the cross-sectional study showed that 61% students had multimodal learning style preferences and that only 39% students had single mode preferences. Amongst the multimodal learning styles, the most preferred mode was bimodal, followed by the tri-modal. Of the 39% students who had single mode learning styles, 26% preferred the kinesthetic mode, 7% preferred the visual mode, and 6% preferred the auditory mode. Thus, these figures are representative of the construct validity of the assessment.

Additional Research Implications:

According to the VAK model, the students' learning styles are dependent on how they prefer to perceive/receive information. They may prefer a single mode, two modes (bimodal), or all three modes (tri-modal) of the information presentation.

Proponents say that teachers should assess the learning styles of their students and adapt their classroom methods to best fit each student's learning style, which is called the 'meshing hypothesis', that a student will learn best if taught in a method deemed appropriate for the student's learning style.

The research study showed that most preferred VAK mode was the kinesthetic and the most preferred teaching—learning method was practical/activity. A positive correlation (Pearson's correlation coefficient, $r = 0.752$) was observed between the preferences of the VAK modes and the teaching learning methods.

It was also observed that a significantly higher number of female students preferred the auditory mode of the learning style as compared to the males; whereas a significantly higher number of male students preferred the kinaesthetic mode (p value <0.05).

The VAK is applicable to an array of contexts. In addition to its traditional usage in education contexts, the VAK facilitates communication in sports coaching, workplace dynamics and even personal relationships.

Multiple Benefits of the Assessment:

- Provides a head start and maximizes learning potential.
- Understanding preferring mode of learning.
- Discover the sort of instruction and teaching style an individual is most likely to benefit from.
- Allows individuals to learn through their own best strategies.
- Provides customized techniques for students to score better on tests and exams.
- Shows how to overcome the limitations of poor instructors.
- Reduces the stress and frustration of learning experiences.
- Expands existing learning and studying strategies.
- Illustrates how to take advantage of natural skills & inclinations.
- Demonstrates how to manage teams more effectively.
- Helps create competent teams with balanced talent mix for efficient completion of specific assignments.
- Gives guidelines with regard to delivering effective presentations to diverse audiences.
- Makes people aware of their:
 - Inherent Potential,
 - Tendencies,
 - Needs and
 - Type of Reinforcement valued
- Conflict resolution between people – Helps understand the differences in their styles, values, ways of communicating and expressing their feelings.
- Marriage/relationships - Creates greater understanding of the partners and the dynamics involved in their relationship, exploring priorities and values, and resolving and preventing conflict.
- IDP / Career and Vocational Guidance – Identifies an individual's preferences in order to determine the factors that are responsible for his/her satisfaction.

REFERENCES:

1. Bloom B.S. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*. New York: David McKay Co Inc.
2. Coffield, F., Moseley, D., Hall, E., Ecclestone, K. (2004). *Learning styles and pedagogy in post-16 learning. A systematic and critical review*. London: Learning and Skills Research Centre.
3. Dunn, R., Dunn, K., & Price, G. E. (1984). *Learning style inventory*. Lawrence, KS, USA: Price Systems.
4. Felder, R.M., & Silverman, L.K. (1988). Learning and teaching styles in engineering education [Electronic Version]. *Engr. Education*, 78(7), 674-681. Retrieved on July 24, 2009 from: <http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/LS-1988.pdf>
5. Fleming, N.D., Mills, C. (1992). Not Another Inventory, Rather a Catalyst for reflection to improve the academy. *Professional and Organisational Development Network in Higher Education*. pp. 137–55. Retrieved on July 14, 2014 from: <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1245&context=podimproveacad>
6. Jackson, C. J. (2005). *An applied neuropsychological model of functional and dysfunctional learning: Applications for business, education, training and clinical psychology*. Cymeon: Australia
7. Kolb D.A. (1984) 'Experiential Learning experience as a source of learning and development', New Jersey: Prentice Hall
8. Stahl, S. A. (2002). Different strokes for different folks? In L. Abbeduto (Ed.), *Taking sides: Clashing on controversial issues in educational psychology* (pp. 98-107). Guilford, CT, USA: McGraw-Hill.

AUTHOR'S BIOGRAPHY**MR. SREENIDHI S K**

The Managing Director of Oscar Murphy Life Strategists, Bangalore. He is a sought-after Motivational Speaker and Keynote Speaker offering various life & leadership trainings for both small & large scale organisations across the globe. He has 30 years of experience in the business world as a Life Strategist, Behavioural Master Trainer, Coach, Change Catalyst, Business Owner and Entrepreneur. His key expertise lies in conducting sessions on Motivation, Leadership, Spirituality, Business Leadership and People Empowerment for cross cultural leadership teams and resonates powerful positive energy while interacting with individuals from across the world.

He is the most sought-after Motivational Speaker, and also a Keynote Speaker who offers various life & leadership trainings for both small & large scale organisations. He is popularly coveted with the title of “Guruji” the one who lends direction for seeking souls, instilling the seeds of hope, nourishing them with knowledge and lending wings to a hundred thousand dreams while engraving self belief, passion and a zest for life

MS. TAY CHINYI HELENA

The Executive Director of Oscar Murphy Life Strategists, Bangalore, which delivers high value L&D programmes to businesses across multiple sectors. Chinyi has trained and coached executive directors, managers and leaders in areas of Strategic Consulting, Leadership, Team Development, Human Resource Optimisation, Performance Management, Coaching and Mentoring across the globe. She helps individual leaders amplify natural strengths and transform limitations to achieve personal, professional and business success. Her stay in Singapore, India and her journey around the globe has helped her realize the commonality and diversity between people in terms of attitudes, thinking, emotions, behaviours etc irrespective of differences in language, culture, lifestyles and a score of other aspects. She is extremely acclaimed world over for sharing deep insights with her coachees and intertwines the missing links that often are the obstacles towards achieving optimal performance at the personal and professional frontiers.