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Teaching Ways and Learning Ways Revisited

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Abstract: In learning and teaching of languages, numerous theories have been put forward. These theories, normally influenced by developments in the fields of linguistics and psychology, have inspired several approaches to the teaching of second and foreign languages. This paper revisits English language teaching approaches, both traditional and modern, as well as learning styles and teaching styles. Such learning style models as The Myers-Briggs Type Indicator (MBTI); Kolb's Experiential Learning Model; the Felder-Silverman Learning Styles Model are explored in-depth in this paper.
Keywords: teaching approach; learning style; teaching style

1. ENGLISH LANGUAGE TEACHING APPROACHES

In learning and teaching of languages, many theories have been proposed. These theories, normally affected by developments in the fields of linguistics and psychology, have inspired many approaches to the teaching of second and foreign languages.

1.1 Traditional English language teaching approaches

1.1.1 The grammar-translation method

This method began in Germany at the end of the 18th century and became popular in early years of the 19th century. It was historically used in teaching Greek and Latin and focused on grammatical rules, syntactic structures, along with learning vocabularies by heart and translation of literary texts. The key features of the grammar-translation method, according to Prator and Celce-Murcia (1979, cited in Brown, 1994) are as follows:

(1) Classes are taught in the students' mother tongue, with little active use of the target language.

(2) Much vocabulary is taught in the form of lists of isolated words.

(3) Long elaborate explanations of the intricacies of grammar are given.

(4) Grammar provides the rules for putting words together, and instructions often focuses on the form and inflection of words.

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(5) Reading of difficult classical texts is begun early.

(6) Little attention is paid to the content of texts, which are treated as exercises in grammatical analysis.

(7) Often the only drills are exercises in translating disconnected sentences from the target language into the mother tongue.

(8) Little or no attention is given to pronunciation.

The aims of the method are to make learners understand the grammar of the language, to provide them with a wide literary vocabulary, and to train them to write the new language accurately by regular practice in translating from the native language. This method's contribution to foreign language learning has been very limited; however, it is still one of the most popular and favorite model of language teaching and learning since it requires few specialized skills on the part of the teacher. Furthermore, tests of grammar rules and of translations are easy to construct as well as objectively scored.

1.1.2 The Direct Method

This method was developed initially as a reaction to the grammar-translation method in an attempt to integrate more use of the target language in instruction. In this method, oral skills are prioritized and explicit grammar teaching is rejected. The learners, it was supposed, picked up grammar in much the same way as children picked up the grammar of their mother tongue. Richards and Rodgers (1986) summarized the principles of this method as follows:

(1) Classroom instruction was conducted exclusively in the target language.

(2) Only everyday vocabulary and sentences were taught.

(3) Grammar was taught inductively.

(4) Oral communication skills were built up in a carefully graded progression and organized around question-and-answer exchanges between teachers and learners in small, intensive classes.

(5) The mother tongue was not used: lessons began with a dialogue using a modern conversational style in the target language which was easy for learners to understand.

(6) Correct pronunciation and grammar were emphasized.

(7) Both speech and listening comprehension were taught.

The objective of the method is to teach learners how to think and communicate in the target language and to use the language spontaneously and orally. Although The Direct Method became very popular at the beginning of the twentieth century, it started to decline since it was difficult to use. Its impractical usage makes it become less and less popular in the language teaching – learning situation because, to use the method in class, the teacher must be a native speaker or have native-like proficiency in the target language. Moreover, the constraints of budge, classroom conditions, time also made such a method difficult to use.

1.1.3 The Audio-lingual Method (ALM)

This method, which was first known as the Army Method, was very popular from the 1940s through the 1960s when the World War II happened and there appeared Americans' need to become orally proficient in foreign languages as part of its overall military operations. The Audiolingual Method is based on structural linguistics (structuralism) and behavioristic psychology (Skinner's behaviorism), and places heavy emphasis on spoken rather than written language. The characteristics of the ALM can be summed up as follows (cited in Brown, 1994):

(1) New material is presented in dialog form.

(2) There is dependence on mimicry, memorization of set phrases, and overlearning.

(3) Little grammatical explanations are provided. Grammar is taught inductively.

(4) Vocabulary is strictly limited and learned in context.

(5) There is much use of tapes, language labs, and visual aids.

(6) Skills are sequenced: Listening, speaking, reading and writing are developed in order.

(7) Great importance is attached to pronunciation.

(8) Successful responses are immediately reinforced.

(9) There is a great effort to get learners to produce error-free utterances.

(10)There is a tendency to manipulate language and disregard content.

(11) Very little use of the mother tongue by teachers is permitted.

The overall goal of the ALM was to create communicative competence in learners. The ALM had many years of popularity, and even to this day, its adaptions are found in contemporary methodologies. The popularity of the ALM decreased, however, because of its ultimate failure to teach long-term communicative proficiency.

1.1.4 Suggestopedia

This method is founded by Lozanov, who believed that we are capable of learning much more than we think. The prime objective of Suggestopedia is to tap into learners' mental potential in order to help them use their brain power and inner capacities to learn and use the target language for communication. The vital roles in the method are comfortable learning environment and music. Learners became suggestible when vocabulary, readings, role-plays, and drama were presented with classical music in the background and with sitting in comfortable seats. Suggestopedia suffered from a major setback. What will happen if the classrooms lack such things as comfortable seats and CD players? Evidence shows that this is indeed the case, and most classrooms lack such facilities.

1.1.5 The Silent Way

This method was founded in the early 70s by Caleb Gattegno, who believed that it is in learners' best interest to develop independence and cooperate with each other in solving language problems. It based on cognitive and was characterized by a problem-solving approach. The name of the method comes from the fact that the teacher typically stayed "silent" most of the time as part of his/her role as facilitator and stimulator. Language learning is usually seen as the learners' problem solving, both independently and as a group, and the teacher needs to stay out of the way in the process as much as possible.

The Silent Way is also well-known for its common use of small colored rods of varying length and color-coded word charts describing pronunciation values, vocabulary and grammatical paradigms. The objectives of the Silent Way are to help learners become highly independent and experimental learners and to encourage them to work as a group - to try and solve problems in the target language together.

1.1.6 Total Physical Response Method

The method was developed by James Asher, a professor of psychology at San Jose State University, California, and became well known in the 70s. The method looks at principles of language acquisition in young learners, most notably that the process involves a substantial amount of listening comprehension in combination with various physical responses (smiling, reaching, grabbing, looking, etc) well before learners begin to use the language orally. It also focused on the ideas that learning should be as fun and stress-free as possible, and that it should be dynamic through the use of accompanying physical activity. The primary objective underlying Asher's Total Physical Response Method was that learning needed to become more enjoyable and less stressful. He believed that a natural way to accomplish this was to

recreate the natural way children learn their native language, most notably through facilitating an appropriate “listening comprehension” period, and encourage learners to respond using right-brain motor skills rather than left-brain language "processing".

1.1.7 The Natural Approach

The Natural Approach was developed by Stephen Krashen and Tracy Terrell in 1983 and has had a wide influence on language teaching in the United States and in the rest the world. It based on Krashen's theories about second language acquisition.The approach focuses on comprehension input and the optimum affective state of the learners; on communication of ideas and no attention to grammar accuracy at the first stage since meaning is considered as the essence of language and vocabulary (not grammar) is the heart of language, on a wide range of activities including games, role plays, dialogs, group work and discussions.There are three generic stages identified in the approach: (1) Preproduction - developing listening skills; (2) Early Production - learners struggle with the language and make many errors which are corrected based on content and not structure; (3) Extending Production - promoting fluency through a variety of more challenging activities. The approach was analogous to Asher's Total Physical Response method in terms of emphasizing the need to make learners reduce anxiety as much as possible during the learning process. As part of the Natural Approach, learners listen to the teacher using the target language communicatively from the very beginning. It has certain similarities with the Direct Method: learners are allowed to use their native language alongside the target language as part of the language learning process. In early stages, learners are not corrected during oral production as the teacher is focusing on meaning rather than form (unless the error is so drastic that it actually hinders meaning). The Natural Approach led naturally into the new English language teaching approach: communicative language teaching.

1.2 A new English language teaching approach: The Communicative Language Teaching Approach

By the mid-eighties or so, the industry was maturing in its growth and moving towards the concept of a wide “approach” to the language teaching that contained various methods, motivations for learning English, kinds of teachers and the needs of individual classrooms as well as learners themselves. It would be the Communicative Language Teaching Approach (CLT). It is the generally accepted “norm” in the field of second and foreign language teaching.

The approach places great emphasis on the goal of creating “communicative competence”. Teaching learners how to use the language is considered to be as important as learning the language itself. The role of the teacher in CLT is quite different from traditional teaching methods. In the traditional classroom, the teacher is in charge of and "controls" the learning process. But, in CLT, the teacher serves as more of a facilitator, allowing students to be in charge of their own learning and that helps learners gain confidence in using the target language in general. Learners are more responsible managers of their own learning (Larsen-Freeman, 1986). Brown (1994: 77) aptly describes the "march" towards CLT:

> "Beyond grammatical discourse elements in communication, we are probing the nature of social, cultural, and pragmatic features of language. We are exploring pedagogical means for 'real-life' communication in the classroom. We are trying to get our learners to develop linguistic fluency, not just the accuracy that has so consumed our historical journey. We are equipping our students with tools for generating unrehearsed language performance 'out there' when they leave the womb of our classrooms. We are concerned with how to facilitate lifelong language learning among our students, not just with the immediate classroom task. We are looking at learners as partners in a cooperative venture. And our classroom practices seek to draw on whatever intrinsically sparks learners to reach their fullest potential”.

David Nunan (1991: 279) lists five basic characteristics of CLT:

(1) An emphasis on learning to communicate through interaction in the target language.

(2) The introduction of authentic texts into the learning situation.

(3) The provision of opportunities for learners to focus, not only on the language but also on the learning process itself.

(4) An enhancement of the learner's own personal experiences as important contributing elements to classroom learning.

(5) An attempt to link classroom language learning with language activation outside the classroom.

In spite of its great attraction, CLT has shown disadvantages: it can not be applied for learners at all levels; it has not overcome the psychological barriers which cripple learners and hinder the learning process; teachers may face important issues for teaching training, materials development as well as testing and evaluation. Unfortunately, although it is currently in use, teachers quickly get bored and resort to the old Grammar Translation Method.

2. LEARNING STYLES AND TEACHING STYLES

2.1 Learning styles

Although many researchers agree that learning styles play an important role in education, there is no single way to describe learning styles. According to Richard Felder, a professor at North Carolina State University, learners have different learning styles because “they preferentially focus on different types of information, tend to operate on perceived information in different ways, and achieve understanding at different rates” (Felder, 1993).

Learning styles can be generally described as “ individual’s preferred approach[es] to organizing and presenting information” (Riding & Rayner, 1998); “the way[s] in which learners perceive, process, store and recall attempts of learning” (James & Gardner, 1995); “distinctive behaviors which serve as indicators of how a person learns from, and adapts to his/her environment, and provide clues as to how a person’s mind operates”(Gregorc, 1979); “a gestalt combining internal and external operations derived from the individual’s neurobiology, personality and development, and reflected in learner behavior” (Keefe & Ferrell, 1990). And Reid (1995) defined learning styles as "natural, habitual, and preferred way[s] of absorbing, processing, and retaining new information and skills". In general, learning styles refer to the overall approach by which a learner learns “acquires, retains, and retrieves information” (Felder, 1993). One learning style is neither preferable nor inferior to another, but is simply different, with different characteristic strengths and weaknesses (Felder, 1998).

A learning-style model classifies learners according to where they fit on a number of scales pertaining to the ways they receive and process information (Felder, 1998). There are many different learning style models in literature. Each model proposed different descriptions and classifications of learning styles. The Table 1 below (adapted from Karagiannidis and Sampson, 2002) presents the most famous and used learning styles theories and models. In each model, the presentation includes: the learner categorisations proposed by each model; the existence of an assessment instrument for categorising each learner in the above categories; and indicative references for each model.

Table 1: Overview of Learning Styles

Name	Learners' Categorisation	Assessment Instrument	References
Kolb Learning Style Inventory	Divergers (concrete, reflective), Assimilators (abstract, reflective), Convergers (abstract/active), Accommodators (concrete/active)	Learning Style Inventory (LSI), consisting of 12 items in which subjects are asked to rank 12 sentences describing how they best learn.	Kolb, 1984; Kolb, 1985
Dunn and Dunn – Learning Style Assessment Instrument	Environmental, Emotional, Sociological, Physical factors.	(i) Learning Style Inventory (LSI) designed for children grade 3-12; (ii) Productivity Environmental Preference Survey (PEPS) – adult version of the LSI containing 100 items	Dunn & Dunn, 1978; Dunn & Dunn, 1999
Felder-Silverman – Index of Learning Styles	Sensing-intuitive, Visual-verbal, Indicative-deductive, Active-reflective, Sequential-global	Soloman and Felder questionnaire, consisting of 44 questions	Felder, 1996; Felder & Silverman, 1988
Riding – Cognitive Style Analysis	Wholists-Analytics, Verbalisers-Imagers	CSA (Cognitive Styles Analysis) test, consisting of three sub tests based on the comparison of the response time to different items	Riding & Cheema, 1991; Riding, 1994
Honey and Mumford – Learning Styles Questionnaire	Theorist, Activist, Reflector, Pragmatist	Honey & Mumford's Learning Styles Questionnaire (LSQ), consisting of 80 items with true/false answers	Honey & Mumford, 1992
Gregoric – Mind Styles and Gregoric Style Delineator	Abstract Sequential, Abstract Random, Concrete Sequential, Concrete Random	Gregoric Style Delineator containing 40 words arranged in 10 columns with 4 items each; the leaner is asked to rank the words in terms of personal preference	Gregoric, 1979; Gregoric, 1982
McCarthy – 4 Mat System	Innovative, Analytic, Common sense, Dynamic	-	McCarthy, 1980; McCarthy, 1997
Gardner – Multiple Intelligence Inventory	Linguistic, Logical-mathematical, Musical, Bodily-kinesthetic, Spatial, Interpersonal, Intrapersonal	an instrument consisting of 8 questions	Gardner, 1993a; Gardner, 1993b

To be continued…

Continued…

Name	Learners' Categorisation	Assessment Instrument	References
Grasha-Riechmann – Student Learning Style Scale	Competitive-Collaborative, Avoidant-Participant, Dependent-Independent.	90 items self-report inventory measuring the preferences of both high school and college students	Hruska-Riechmann & Grasha, 1982; Grasha, 1996
Hermann – Brain Dominance Model	Quadrant A (left brain, cerebral), Quadrant B (left brain, limbic), Quadrant C (right brain, limbic), Quadrant D (right brain, cerebral)	120 questions that refer to four profile preferences codes corresponding to each quadrant	Herrmann, 1982; Herrmann, 1995
Mayers-Briggs – Type Indicator	Extroversion, Introversion, Sensing, Intuition, Thinking, Feeling, Judgement, Perception	(i) MBTI (Myers-Briggs Type Indicator), (ii) Kiersey Temperament Sorter I, and (iii) Kiersey Character Sorter II	Myers & Kirby, 1994; Myers, et al, 1998

Source: Adapted from Karagiannidis and Sampson (2002)

In this part, the author summarizes three well-known learning style models: The Myers-Briggs Type Indicator, Kolb's Experiential Learning Model, The Felder-Silverman Model. However, the researcher is only focusing on and using the Felder-Silverman learning style model since the Felder-Silverman Model has not been applied to EFL learners and most other learning style models classify learners in few groups whereas Felder and Silverman describe learners' learning styles in more detail.

2.1.1 The Myers-Briggs Type Indicator (MBTI)

The MBTI has been widely used to classify learner learning styles according to their preferences on four dimensions derived from Jung's Theory of Psychological Types:

(1) Orientation to life: extraverted (try things out, focus on the outer world of people) or introverted (think things through, focus on the inner world of ideas).

(2) Perception: sensing (practical, detail-oriented, focus on facts and procedures) or intuitive (imaginative, concept-oriented, focus on meanings and possibilities).

(3) Decision making: thinking (skeptical, tend to make decisions based on logic and rules) or feeling (appreciative, tend to make decisions based on personal and humanistic considerations).

(4) Attitude to the outside world: judgment (set and follow agendas, seek closure even with incom plete data) or perception (adapt to changing circumstances, postpone reaching closure to obtain more data).

Some of the characteristics of each of these personality dimensions are shown in Table 2. The Myers-Briggs Type Indicator has been widely used to classify learner learning styles in various disciplines.

Table 2: Preferences of Myers-Briggs Personality Types

ORIENTATION TO LIFE	Extroverted Group interactions Applications	Introverted Working alone Concepts and ideas
PERCEPTION	Sensing Facts and data Routine	Intuitive Impressions Not routine
DECISION MAKING	Thinking Objective Logical	Feeling Subjective Search for harmony
ATTITUDE TO OUTSIDE WORLD	Judgment Planning Control	Perception Spontaneity Adaptive

Source: Adapted from CRLT Occasional Paper No. 10 (1998)

2.1.2 Kolb's Experiential Learning Model

David Kolb' model places great emphasis on the importance of experience to explain differences in learning (Kolb, 1984). According to this model, learner's learning styles are classified into four types:

(1) The divergers, who combine concrete experience and reflective observation;

(2) The assimilators, who combine reflective observation and abstract conceptualization;

(3) The converges, who combine abstract conceptualization and active experimentation; and

(4) The accommodators, who combine concrete experience and active experimentation.

The four learning styles are distinguished based on the concerns that learners focus upon the questions: "Why?", "What?", "How", and "What if?".

The *divergers* will ask why this is important to know. Learners of this type prefer explanations of how course material relates to their experience, interests, and future careers.

The *assimilators* want to know what the concept is. Learners of this type respond to information presented in an organized, logical fashion and benefit if they are given time for reflection.

The *convergers* will ask how this concept is applied. Learners of this type like having opportunity to work actively on well-defined tasks and to learn by trial-and-error in an environment that allows them to fail safely.

The *accommodators* wonder what the possibilities of this concept are. Learners of this type like applying course material in new situations to solve real problems. Figures 1 &2 below will help clarify this model.

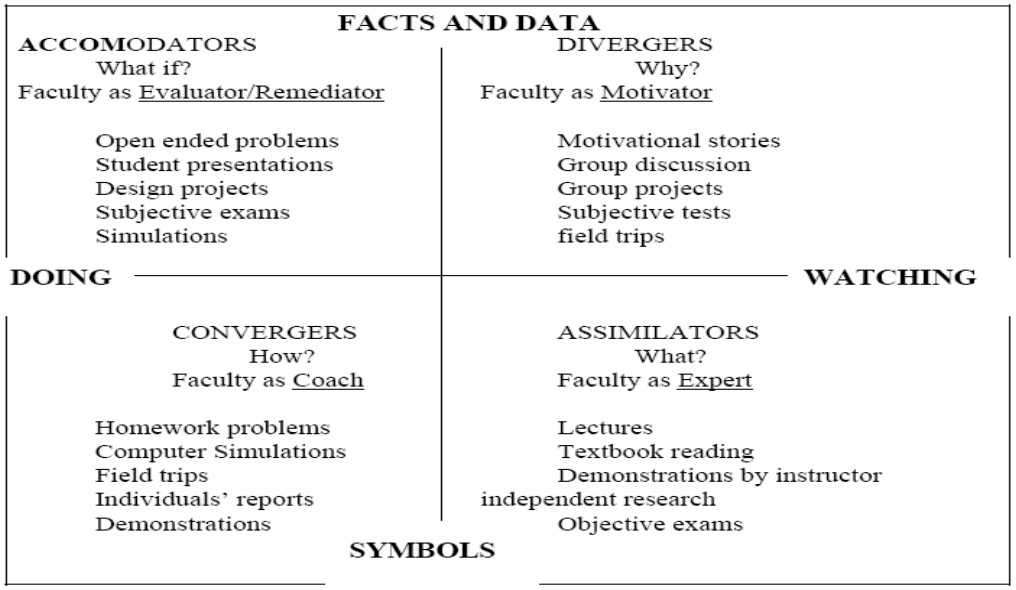
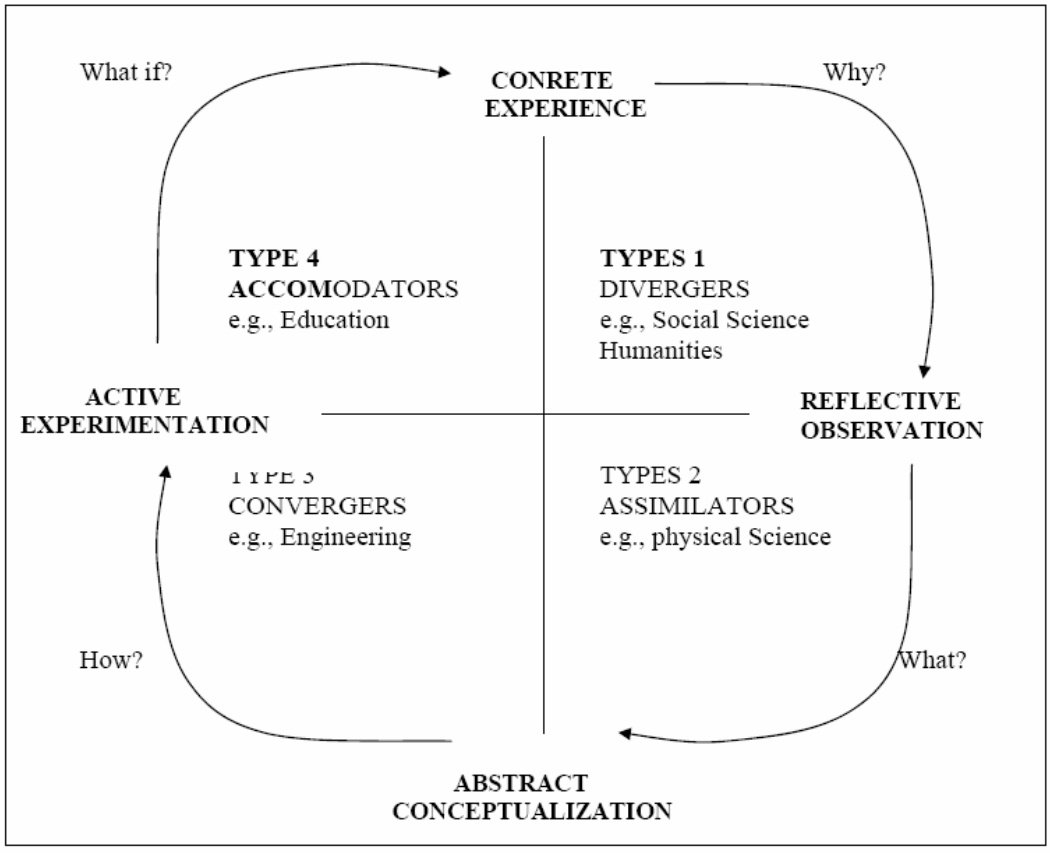


Figure 1: Sample Activities and Roles of Faculty for Each Kolb Learning Style



Source: Adapted from CRLT Occasional Paper No. 10 (1998)

Figure 2: Learning Style and Learning Circle Based on Kolb's Model

2.1.3 The Felder-Silverman Learning Styles Model

This model was developed by Richard Felder and Linda Silverman (Felder, 1993; Felder and Silverman, 1998) comprises five dimensions: Processing dimension (Active/Reflective), Perception dimension (Sensing/Intuitive), Input dimension (Visual/Verbal); Understanding dimension (Sequential/Global) and Organization dimension (inductive and deductive). Five learners' learning styles identified by Felder and Silverman can be shortly described as follow:

Active/Reflective learners: To understanding new information, active learners do something with it such as discussing, explaining or even debating while reflective learners prefer to think about new information by viewing the material before acting on it.

Sensing/Intuitive learners: sensing learners think practically, concretely and methodically towards facts and procedures. They like matters that have connections to the real life; intuitive learners tend to be imaginative and enjoy abstract and theoretical information. They always have innovative approaches to solve problems.

Visual/Verbal learners: visual learners understand and remember new information better when it is presented in combination with using pictures, charts, diagrams, etc. whereas verbal learners understand and remember new information better through written and spoken explanations.

Sequential/Global learners: sequential learners understand new information in linear logical steps while global learners learn in large jumps and think historically.

Inductive/Deductive learners: inductive learners have an observation before looking at the rules and theories. On the other hand, deductive learners look at the rules and theories before having an observation within the confines of these rules and theories.

Tables 3 will summarize Felder's five learning style dimensions.

Table 3: Felder's model of learning styles

Learning style	Type of learner	Learning style	Type of learning
Active	Processes information through engagement in physical activity or discussion	Reflective	Processes information through introspection
Sensing	Sights, sounds, physical sensations: tend to be concrete, practical, methodical, oriented towards facts and hands on procedures	Intuitive	Memories, thoughts, and insights: tend to be comfortable with abstractions (theories, mathematical models). Innovative and rapid problem solvers
Visual	Info most effectively perceived through pictures, diagrams, flow charts, demonstrations	Verbal	Info most effectively perceived through written and spoken explanations
Sequential	Understanding gained through a logical progression of incremental steps	Global	Understanding gained in large 'big picture' jumps
Inductive	Learns best through being given acts and observations, from which underlying principles are inferred	Deductive	Learns best through given principles from which consequences and applications are deduced

Source: adapted from Edmond (2007)

The active/reflective dimension is rather similar to Kolb's active experimental/reflective observation style. The sensing / intuitive style is also found in the Myers-Briggs Type Indicator (Myers & Myers, 1980). Table 4 will be an overall comparison of the dimensions in three above-mentioned models.

In the research "Learning and Teaching Styles in Foreign and Second Language Education" (Felder, 1995: 26), he proposes that induction and deduction dimension can be used in parallel, respectively in language acquisition and language learning. Since the progression is from specifics to generalizations, acquisition is seen as being inductive. On the other hand, language learning is a "conscious process ... of rules of syntax and semantics followed by specific applications of the rules, with corrective feedback reinforcing correct usage and discouraging incorrect usage" (Felder 1995: 26). Learning from general to specific suggests a deductive process.

Recently, in the work with Soloman, Felder pushed the induction and deduction dimension from the model (Table 5) for the anxiety that "*instructors [would] give our instrument to students, find that the students prefer deductive presentation, and use that result to justify continuing to use the traditional deductive instructional paradigm in their courses and curricula*" (Felder & Soloman, 2004).

"Therefore, inductive and deductive processes are complementary in nature instead of competitive. If a student is to achieve complete command of a language, a combination of inductive and deductive processes will be used: that is, a student will use inductive processes to speak fluently (acquisition) and deductive processes (learning) to be able to write grammatically correct compositions, etc." (Felder & Soloman, 2004).

Table 4: Comparison of Learning Style Models

MODE	RANGE	Myers-Briggs	Kolb	Felder & Silverman
ORIENT TO LIFE PROCESSING	Extrovert – introvert	X		
	Active- Reflective		X	X
PERCEPTION DECISION MAKING	Concrete- Abstract		X	
	Feeling- Thinking	X		
PERCEPTION ATTITUDE TO OUTSIDE WORLD	Sensing- Intuitive	X		X
	Judging- Perceiving	X		
INPUT	Visual- Verbal			X
ORGANIZATION	Inductive- Deductive			X
UNDERSTANDING	Sequential- Global			X

Source: adapted from CRLT Occasional Paper No. 10 (1998)

2.2 Learning Styles and Cognitive Traits

Humans typically have a number of cognitive traits. However, cognitive traits which are important for learning include working memory capacity, inductive reasoning ability, information processing speed, and associative learning skills.

In this part, only working memory capacity (WMC) is mentioned in the relationship between learning styles and cognitive traits.

Table 5: Felder & Soloman summary of the different learning styles

Active Learners Improve retention and understanding of information by discussing or explaining it to others. Benefit from: • Group activities in which members explain topics to each other • Finding ways to apply or use the information	**Reflective Learners** Prefer to think about the material first. Benefit from: • Periodically reviewing what has been read and thinking of possible questions and applications • Writing a summary of readings or class notes
Sensing Learners Like learning facts and solving problems using well-established methods; enjoy courses that have connections to the real world. Benefit from: • Connecting information to real world applications	**Intuitive Learners** Like discovering possibilities and relationships; like innovation and abstract information. Don't like courses that require memorization and routine calculations. Benefit from: • Finding interpretations or theories that link the facts • Using care to read the entire question before answering and rechecking work to prevent careless mistakes
Visual Learners Remember what they see; like pictures, diagrams, flow charts, demonstrations. Benefit from: • Finding or drawing diagrams, sketches, schematics, photographs, videos, CD-ROM study aids, etc., to describe course material • Using concept mapping to visually arrange key points • Color-coding notes	**Verbal Learners** Get most out of written and spoken explanations. Benefit from: • Writing summaries or outlines of course material • Working in groups to hear classmates' explanations
Sequential Learners Gain understanding in linear, logical steps Benefit from: • Fill in skipped steps by either asking the instructor or consulting references • Outlining course lecture material in a logical order • Relating new topics to things already known to strengthen global thinking skills	**Global Learners** Learn in large jumps, randomly absorbing material until they suddenly "get it" Benefit from: • Skimming through the entire chapter to get an overview before starting to study specific information • Relating the subject to things already known to see bigger picture

Source: adapted from: http://www.wscc.cc.tn.us/qep/Student%20Learning%20Style%20Handout.pdf

In earlier times, working memory was also referred to as short-term memory. Richards-Ward (1996) named it the Short- Term Store (STS) to emphasize its role of temporal storage of recently perceived information. Working memory allows us to keep active a limited amount of information (roughly 7+/_ 2 items) for a brief period of time. According to Baddeley (1986), working memory was defined structurally while others defined it as a process. In spite of their two different points of views on the structure of the working memory, they both agree that the working memory consists of both storage and operational sub-systems (Richards-Ward, 1996).

In the research "An Exploratory Study of the Relationship between Learning Styles and Cognitive Traits" (Graf, Lin, Jeffrey, Kinshuk), after investigating the relationship between the Felder-Silverman learning style model and working memory capacity (as displayed in Figure3), one of the traits in the Cognitive Trait Model, authors wrote that: *" For systems that already consider both, learning styles and cognitive traits, the relationship can be used to build a more robust student model by including the information about learning styles in the detection process of cognitive traits and vice versa. According to current investigations, learners with a high WMC tend to favor reflective, intuitive, and sequential learning styles, and vice versa. On the other hand, learners with a low WMC tend to prefer active, sensing, visual, and global learning styles."*

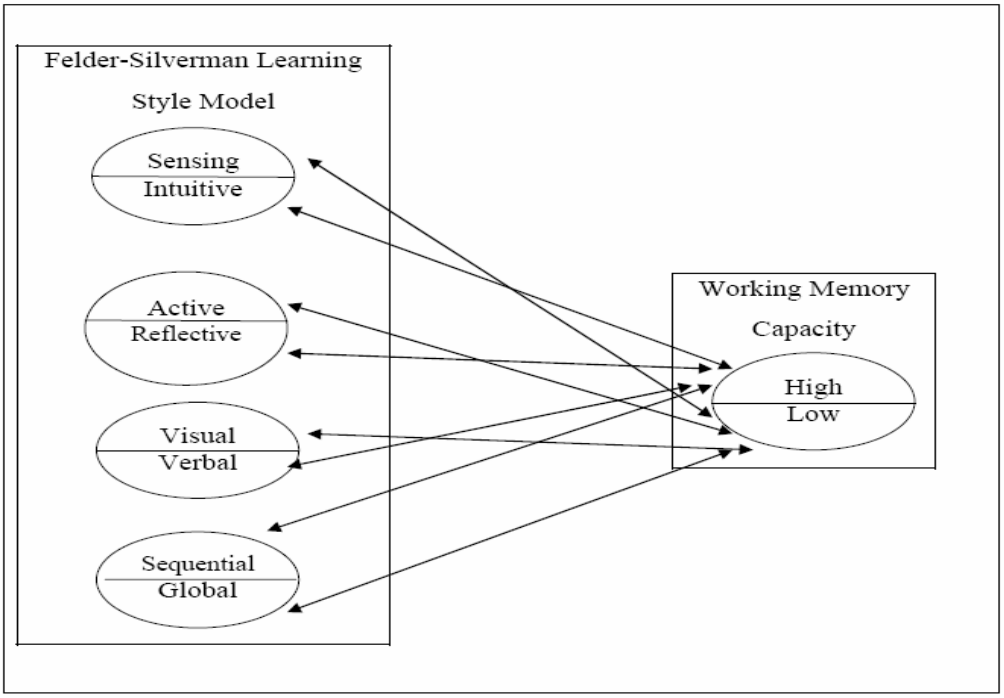


Figure 3: The relationship between the Felder-Silverman learning style model and working memory capacity

2.3 Teaching Styles

Learners learn in many ways. Teaching styles also vary: "Some instructors lecture, others demonstrate or discuss; some focus on principles and others on applications; some emphasize memory and others understanding" (Felder & Silverman 1988). We hardly find the same teaching style between two teachers since each teacher has his/her own ways of teaching based on his /her own characteristics.

A teaching style is defined as " the collection of many attitudes and behaviors he [a teacher] employs to create the best possible conditions under which learning can take place … Teaching styles is a

complex amalgam of belief, attitude, strategy, technique, motivation, personality and control" (Wright, 1987); with a similar conception, teaching style defined by Dixon & Woolhouse as: " a system of conscious or unconscious characteristic behaviors, attitudes and activities provided by that teacher with the intention to induce learning, by the deliberate and systematic creation and control of those conditions in which learning can occur" (Dixon, & Woolhouse, 1996).

Felder (also cited in Visser, McChlery & Vreken, 2006) referred to teaching style as "a combination of teaching methods and techniques that a lecturer/teacher prefers in his/her. Some lecturers lecture, others demonstrate or lead learners to self-discovery; some focus on principles and others on applications; some emphasize memory and others understanding" (Felder, 2004). Many principles of good teaching are mentioned in Van Hamburg (2006), including encouraging student-lecturer contact and cooperative and active learning, and the need to respect diverse learning styles.

Hayes (1989), divided teaching styles into two modes: the responsive, collaborative, learner-centered mode and the controlling, teacher-centered mode. Of course, we often mention traditional method to infer teacher-centered mode in which teachers plays the dominant roles which determine teaching and learning in class.

Dunn & Dunn (1979) introduced six types of teaching as follows:

(1) The task-oriented: these teachers prescribe the materials to be learned. Learning to be accomplished may be specified on an individual basis.

(2) The cooperative planner: these teachers are still "in charge of" the learning process, but with their adult experience and professional background, they guide the learners' learning. They listen to learners' opinions and respect them. They encourage and support learners' participation at all levels.

(3) The learner-centered: this teacher provides a structure to pursue whatever learners want to do or whatever interests them.

(4) The subject-centered: these teachers focus on organized content to the near exclusion of the learners. By "covering the subject", they satisfy their consciences even if little learning takes place.

(5) The learning-centered: these teachers have equal concern for the learners and for the curricular objectives, the materials to be learned. They develop learners' autonomy in learning.

(6) The emotionally exciting and its counterpart: These teachers show their own intensive emotional involvement in teaching. They enter the teaching, learning process with zeal and usually produce a classroom atmosphere of excitement and high emotion (Dunn, & Dunn, 1979, cited in Nguyen, 2008).

It is crucial to say that whenever teachers try to dominate the class with their power, they inhibit learning process and learners in the class are not allowed to take active roles or show and share their own opinions and, therefore, learners have to become information receivers.

2.4 Learning and Teaching styles

In a language class where learning and teaching styles' mismatch occurs, the learners tend to be bored and inattentive, do poorly on tests, get discouraged about the course, the curriculum, and themselves, and in some case change to other curricula or drop out of school (Felder & Silverman, 1988). Teachers, confronted by low test grades, unresponsive or hostile classes, poor attendance and dropouts, know something is not working. They may become overly critical of their learners (making things even worse) or begin to wonder if they are in the right profession. Most seriously, society loses potentially excellent teachers. Since "a mismatch between teaching and learning styles causes learning failure, frustration, and demotivation" (Reid, 1995), to overcome these problems, teachers should strive for a balance of instructional methods (as opposed to trying to teach each learner exclusively according to his or her preferences.) If the balance is achieved, all learners will be taught partly in a manner they prefer, which leads to an increased comfort level and willingness to learn, and partly in a less preferred manner, which provides practice and feedback in ways of thinking and solving problems which they may not initially be comfortable with, but which they will have to use to be fully effective professionals.

For those reasons, Felder and Silverman (1988) proposed a parallel teaching style model intended to map the instructional methods used by teachers to the corresponding proposed learning style phases. The teaching and learning styles model is represented in the table 6.

Table 6: Models of learning & teaching styles

Models of Learning & Teaching Styles

A student's learning style may be defined in large part by the answers to five questions:

1) What type of information does the student preferentially perceive: sensory (external)—sights, sounds, physical sensations, or intuitive (internal)—possibilities, insights, hunches?

2) Through which sensory channel is external information most effectively perceived: visual—pictures, diagrams, graphs, demonstrations, or auditory— words, sounds? (Other sensory channels—touch, taste, and smell—are relatively unimportant in most educational environments and will not be considered here.)

3) With which organization of information is the student most comfortable: inductive—facts and observations are given, underlying principles are inferred or deductive—principles are given, consequences and applications are deduced?

4) How does the student prefer to process information: actively— through engagement in physical activity or discussion, or reflectively— through introspection?

5) How does the student progress toward understanding: sequentially—in continual steps, or globally—in large jumps, holistically?

Teaching style may also be defined in terms of the answers to five questions:

1) What type of information is emphasized by the instructor: concrete— factual, or abstract—conceptual, theoretical?

2) What mode of presentation is stressed: visual—pictures, diagrams, films, demonstrations, or verbal— lectures, readings, discussions?

3) How is the presentation organized: inductively—phenomena leading to principles, or deductively— principles leading to phenomena?

4) What mode of student participation is facilitated by the presentation: active—students talk, move, reflect, or passive—students watch and listen?

5) What type of perspective is provided on the information presented: sequential—step-by-step progression (the trees), or global—context and relevance (the forest)?

Dimensions of Learning and Teaching Styles

Preferred Learning Styles		Corresponding Teaching Style	
sensory		concrete	
	perception		content
intuitive		abstract	
visual		visual	
	input		presentation
auditory		verbal	
inductive		inductive	
	organization		organization
deductive		deductive	
active		active	
	processing		student participation
reflective		passive	
sequential		sequential	
	understanding		perspective
global		global	

Source: adapted from Felder and Silverman (1998)

According to this model, Felder and Silverman suggest that a learner preferring the sequential learning style would respond well to a teacher who presents information in a step-by-step fashion. It also follows that a learner preferring the global learning style would respond well to a teacher who presents information in a holistic (big-picture) fashion. Similarly, a learner preferring the sensing learning style would respond well to a teacher who presents facts and data while a learner preferring the intuitive learning style would respond well to a teacher who presents concepts and principles. The same can be inferred for the visual/verbal dimension but not the active/reflective dimension since, according to Felder and Silverman (1988), both active and reflective learners respond well to an active mode of instruction and not to a passive one.

They state that "Active [student participation] signifies that students do something in class beyond simply listening and watching, e.g., discussing, questioning, arguing, brainstorming, or reflecting. Active student participation thus encompasses the learning processes of active experimentation and reflective observation."

Felder and Silverman (1988) discuss, at length, the implications of the learning and teaching style models on learners' classroom experience (see also Felder 1993 and Felder 1996). They suggested that teachers can effectively engage learners in the learning process by adopting a multi-style approach in instruction such that no one dimension of learning and teaching is preferred.

Recommendations to achieve this seemingly overwhelming feat were in harmony with those made by advocates of active, collaborative, and cooperative learning (McKeachie 1980, Johnson et al. 1991, Wankat & Oreovicz 1993, Smith & Waller 1997, and Wankat et al. 2002).

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