CHAPTER – 2

SURVEY OF RELEVANT LITERATURE
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This Chapter contains discussions, theoretical as well as empirical, with regard to the variables Sensory Preferences, Emotional Intelligence and Intellectual Ability. This Chapter has been divided in to three parts. Part I contains the summery of the researches conducted with regard to The Sensory Preferences of Primary School Teachers. Part II involves the findings with regard to Emotional Intelligence of Primary School Teachers. Part III contains the summery of the researches conducted with regard to the variable Intellectual Ability.

2.1 SENSORY PREFERENCES

An account with regard to the variable ‘Sensory Preferences’ is available in a book titled ‘How The Brain Learns’ by David. A. Sousa (2006). This book contains a list of Internet sites designed for professionals in neuroscience and teacher educators. It was expected that detailed information with regard to the findings of the researches on ‘Sensory Preferences’ may become available through the browsing of these Internet sites. It has now been downloaded and the narration has been prepared. However, it needs to be mentioned here that our brain takes in more information from our environment in a single day than the largest computer does in a year. That information is detected by our five senses. The senses do not all contribute equally to our learning. Over the course of our lives, sight, hearing and touch (including Kinesthetic experiences) contribute the most. People develop preferences for certain senses as they gather information from their environment. Sensory Preferences can affect learning and teaching (Sousa, D.A., 2006: 41, 57).

The narration which has been prepared on the basis of the findings downloaded from the Internet sites are –

A comprehensive note on ‘Sensory Preferences and Learning Style and Memory’ has been prepared by Ted. F. May, Director, University Disability Services, and University of Denver. This note has been downloaded from Google and it is being reproduced below –

1. Sensory Preferences and Learning Style:

Although we use all five senses to collect information from our environment, these five senses do not contribute equally to our knowledge base. Most people do not use
sight, hearing and touch equally during learning. Just as most people develop left-right handed preference, they also develop a preference for learning. Sensory preferences (also called modality) are an important component of a person’s learning style.

2. Learning Style and Teaching Style:
   i) Students with different sensory preferences will behave differently during learning.
   ii) Variations in learning style behavior can be misinterpreted as the student being inattentive or actually intentionally misbehaving. (Doodling/fidgeting in class.)
   iii) People tend to teach the same way they learn.
   iv) Understand your own learning style and sensory preferences and how your preferences impact your own learning and teaching.

3. Learning and Memory:
   i) Research in learning and memory indicate (this is simplistic representation) that the human brain follows a sequence in the retention of information:
      ii) Items from the beginning of the learning period
      iii) Items from the end of the learning period
      iv) Items that can be associated with previous learning
      v) Items that are somehow emphasized as being important or having some outstanding quality.
      vi) Items that appeal to the five senses.
      vii) Items of particular interest to the person.

4. Sequence of Human Information Input and Output:
   i) Receiving – people use all five senses (sight, sound, touch, taste, smell), but they do not use all five senses equally.
ii) The first step in the information retention process is the information being processes in a person’s short-term memory (STM). STM is also called intermediate/working memory.

iii) Analysis of information must take place if the information being processed proceeds from the short-term-memory (STM) to long-term memory (LTM). Usually, this process involves a person’s recognizing patterns, finding the information of interest, and seeing the information being presented as important.

iv) Memorization of information does not mean a person has retained the information. Retention of information requires a person to manipulate the information using a form of communication, thereby cognitively demonstrating the meaning of the information retained.

v) A person who has retained the information can then manipulate the information using varied mental and physical processes/functions.

5. Other Considerations about Memory:

i) Emotions impact what we learn and remember (retain).

ii) Making sense of the information and then assigning meaning to the information to the learning is crucial for memory retention and finding meaning in the material.

iii) Everything that the person has experienced before the learning experience will affect the individual’s perception and memory retention of the material being studied.

iv) There is a difference between learning and retention. We can learn something new for just a few minutes and lose it forever. Souza, David A., ‘How The Brian Learns’, 2005.

6. Emotions and Learning:

Regardless of temperament, humans are emotional beings. The emotions that students associate with a learning experience (but not to the content) become part of the non-declarative memory system. Example: Students can often remember that they like a particular
topic but cannot recall many details about the topic. Classroom climate is important in the learning process. How can classroom climate be impacted? Consider this statement made by Professor A: “Today all of you in this class of 30 have an A. At the end of this class, only three of you will still have that A”. Describe the classroom climate created by Professor A.

Buddhist philosophy suggests that there are common influences impacting the life experience of humans. These influences are called the Eight Worldly Winds:

- Pain – Pleasure
- Gain – Loss
- Praise – Blame
- Fame - Shame

Take a moment to think about how these influences can shape the lives of students. Follow this by considering how these influences might shape a student’s academic experience in both positive and negative ways (Kasl & Charlotte, 2005).

Finally, the emotional state of the student in the learning environment impacts the student physically. If a student is positive about the learning environment, the body will respond by releasing endorphins that activate the frontal lobes. If the student is experiencing a negative reaction about the learning environment, cortisol is released into the body, activating the body’s defense mechanisms. Cortisol appears to interfere with the recall of emotional memory (Kuhlman, Kirschbaum, & Wolf, 2005).

7. Final Thoughts: Learning-Style & Memory

Storing information, remembering information and learning new information are dynamic processes.

The computer metaphor of the brain doesn’t work. Computers are closed binary systems, and the human brain has no such limitations. The human brain is an open, parallel processing system continually interacting with the physical and social world.

The brain stores sequences of patterns, and recalling a segment of pattern can activate the whole. Knowing a word is not the same as understanding its meaning. Emotion is a powerful and often misunderstood force in learning and memory. Students with different sensory preferences will behave differently in the learning environment. People who teach often use their preferred learning style as the base of their preferred teaching style.

A Sensory Preference Self Test (as downloaded from Google) which has been used to collect the relevant data is as mentioned below:
SENSORY PREFERENCES SELF TEST

In this short self-test you will examine which senses you prefer to rely on when processing information and learning. Answer each question with your first “gut reaction” and try not to think too hard about each response.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If you could choose any way to learn, which would you choose?</td>
<td>Reading information on your own</td>
<td>Listening to a lecture</td>
<td>Participating in an experiment or lab activity</td>
</tr>
<tr>
<td>2</td>
<td>When giving directions for how to get somewhere, do you:</td>
<td>Write the directions in sentence form</td>
<td>Describe the directions aloud</td>
<td>Show someone the way by taking them or having them follow you</td>
</tr>
<tr>
<td>3</td>
<td>Which are you more likely to recall?</td>
<td>What was written in words</td>
<td>What was said in conversation or lectures</td>
<td>What you did</td>
</tr>
<tr>
<td>4</td>
<td>Which type of instructor do you prefer? On who….:</td>
<td>Assigns reading and other text materials</td>
<td>Facilitates class discussion</td>
<td>Lets you discover ideas through experience</td>
</tr>
<tr>
<td>5</td>
<td>In planning to buy a car, what influences your choice the most?</td>
<td>Reading materials about cars</td>
<td>Talking to friends about their cars</td>
<td>Test-driving different cars</td>
</tr>
<tr>
<td>6</td>
<td>Which are you more likely to recall?</td>
<td>The way a person’s name is spelled</td>
<td>The sound of a person’s name</td>
<td>Your interactions with a person</td>
</tr>
<tr>
<td>7</td>
<td>Which would you prefer to do?</td>
<td>Write a story</td>
<td>Listen to music</td>
<td>Make something</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Total A Answers</th>
<th>Total B Answers</th>
<th>Total C Answers</th>
<th>Total D Answers</th>
</tr>
</thead>
</table>

[19]
Analysis of the data obtained through this Self Test are as mentioned below:

i) **Reading/Writing (Higher score on Column A)**

   The more read/write answers you chose, the more likely you learn best through reading or writing. Therefore, read all assignments. Focus on headings and subheadings to help you find the author's organization of information. You might find it useful to reread and rewrite words and notes. Use flashcards, lists, and charts to study.

ii) **Listening/Aural (Higher score on Column B)**

   The more aural answers you chose, the more likely you learn best by listening. You might think that you should tape your lectures, but that won't help you separate and organize important lecture ideas. Instead, try converting written lecture notes to audio tapes. To do so, you first review and edit your notes to identify the main ideas and important details. Then read your notes aloud into a tape recorder, leaving brief amounts of time between main ideas and questions. This gives you time to think and study. Participation in study groups and class discussions also provide ways to learn from what you hear.

iii) **Interactive/Kinaesthetic (Higher score on Column C)**

   The more Kinaesthetic answers you chose, the more likely you learn by direct experience. When you learn from direct experience, you learn by touch or by physical movement. The more you do, the more you learn. Highlighting, underlining, labelling information, and writing add movement to learning. Mapping, charting, or creating other graphics also are ways to learn by doing. Role-plays, models, and experiments also help you learn actively. Participation in study groups or tutoring others provides additional ways to become an active learner.

iv) **Visual/Sight (Higher score on Column D)**

   The more visual answers you chose, the more likely you learn visually. Visual learners prefer flash charts, visual outlines or maps, and graphics. Adding meaningful
symbols, colors, and graphics to notes also provide visual cues. Try to visualize how information appears on a page. In study groups or discussions, focus on how people look when they speak.

SENSORY PREFERENCES OF INFORMATION

A Sensory Preference Information is mentioned below:

Sensory Preference Information

We learn through all of our senses, but generally favour one or two. We process visually (through images, colour and form), aurally (by hearing and sound), kinaesthetically (by moving and manipulating) and through formal text processing (through reading and writing.) Here are your results:

Visual/Sight

Visual learners prefer seeing what they are learning. Pictures, images, graphs and colours help them understand ideas and mentally organize information better than explanations. A drawing may help more than a discussion about the material. When someone explains something to a visual learner, he or she may create a mental picture of what the person talking describes.

Visual learners prefer to study with charts, visual outlines or other images. Adding meaningful symbols, colours, and graphics to notes provide visual cues. Try to visualize how information appears on a page.

Visual learners are more shape and form-oriented. Formal text-oriented people depend more on words or numbers in their images.

Listening/Verbal/Aural

Auditory learners prefer spoken messages. Some auditory learners need to hear their own voice to process the information, but others process information through listening to others speak in lectures and small groups or discussions. They can attend aurally to details, translate the spoken word easily into the written word, and are not easily distracted in their listening ability.
Auditory learners will benefit from converting written lecture notes to audio tapes. To do so, you first review and edit your notes to identify the main ideas and important details. Then read your notes aloud into a tape recorder, leaving brief amounts of time between main ideas and questions. This gives you time to think and study. Auditory learners will benefit from regularly attendance in classes and participation in study groups and class discussions.

**Kinaesthetic/Interactive/Tactile Learning**

Kinaesthetic learners want to sense the position and movement of what they are working on. Tactile learners want to touch. "Enough talking and looking," they may say. "Let's work with this stuff. Let's get our hands dirty already."

Those preferring hands-on, Kinaesthetic learning gravitate toward active, sensory-motor learning. They tend to prefer "learning by doing," and may find theoretical and abstract thinking a challenge. Kinesthetic learners tend to have good motor memory and motor coordination.

When you learn from direct experience, you learn by touch or by physical movement. The more you do, the more you learn. Most college teaching relies more on traditional formal text learning. But Kinesthetic learners can integrate more interaction by highlighting, underlining, and labelling information. Try mapping, charting, or creating other graphics along with using role-playing, models, and experiments to help you learn actively. When using flash cards place them on the ground and organize them in meaningful groups. Buy a roll of large “butcher paper” and hang it on your walls for processing/mapping and drawing out information you are trying to learn. Place it in different areas of your room for different topics. Participation in study groups or tutoring others provides additional ways to become an active learner.

**Formal Text Processing (Reading and Writing)**

Most college courses use this as the dominant mode of learning. You are required to do a significant amount of reading and writing in order to be successful in most college classes. If this is your dominant style you find it natural to process material by reading, taking notes, and organizing your material on paper (or on a computer) through traditional formats such as outlines and written or typed text.
To maximize your learning experience, continue with the basics: preview, then read all assignments, focus on headings and subheadings to help you find the author's organization of information. Use flashcards, lists, and charts to study. In addition, be sure to challenge yourself to integrate other modes of processing (mapping, study groups, etc.) to enhance and balance your learning experience.

**SENSORY PREFERENCE COMPARISON**

A Sensory Preference Comparison in between class, while studying and during exams is mentioned below:

<table>
<thead>
<tr>
<th></th>
<th>In Class</th>
<th>While Studying</th>
<th>During Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visual/Sight</strong> (prefers pictures, charts, diagrams, graphs, etc.)</td>
<td>• Underline important points</td>
<td>• Underline notes and text</td>
<td>• Recall pictures</td>
</tr>
<tr>
<td></td>
<td>• Highlight with different colors</td>
<td>• Highlight notes and text (colors)</td>
<td>• Draw concept map of essay</td>
</tr>
<tr>
<td></td>
<td>• Use symbols, charts and graphs</td>
<td>• Summarize with images</td>
<td>• “Dump” formulas and diagrams</td>
</tr>
<tr>
<td><strong>Listening/Aural</strong> (prefers hearing information)</td>
<td>• Attend lectures, discussions and tutorials</td>
<td>• Discuss material in study group</td>
<td>• Listen to your inner voice to recall information</td>
</tr>
<tr>
<td></td>
<td>• Tape lecture for later</td>
<td>• Summarize notes, then read out loud</td>
<td>• Talk out question under breath</td>
</tr>
<tr>
<td><strong>Reading/Writing</strong> (prefers reading or writing about information)</td>
<td>• Create lists and headings</td>
<td>• ID key words and associate them with details</td>
<td>• Use key words to trigger more complete answers</td>
</tr>
<tr>
<td></td>
<td>• Take complete lecture notes</td>
<td>• Reread notes and text and summarize them in writing</td>
<td>• At the beginning of the exam, write out important lists</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reread and summarize old tests</td>
<td>• Essay – write thesis, then outline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Answer (in writing) the review questions</td>
<td>• Use Information Matrix to help organize</td>
</tr>
<tr>
<td><strong>Interactive/ Kinesthetic</strong> (prefers moving, touching, visualizing movement or hands-on Activities to learn information)</td>
<td>• Use all senses in class</td>
<td>• Trial and error is important - can learn from mistakes</td>
<td>• Remember examples</td>
</tr>
<tr>
<td></td>
<td>• Labs- field trips</td>
<td>• Create personal examples</td>
<td>• Stretch or move to jog memory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use pictures to illustrate notes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stand, move, walk</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Study in an exam-like environment</td>
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</tr>
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A comprehensive note on ‘Types of Learning? A pedagogic hypothesis put to test’ has been prepared by Maike Loob. This note has been downloaded from Google and it is being reproduced below:

The learning type theory maintains that the (individual) learning performance of pupils is enhanced by taking into consideration the different “channels of perception”. This theory has become largely independent of its author Frederic Vester. It is being widely disseminated through publications and events of various kinds and has become extremely popular. Concepts of learning regarding this subsist therefore in the minds of pupils, students and last but not least teachers and academics that considers this problematic pedagogic construct plausible and keeps on transmitting it uncritically.

An analysis of these concepts is particularly crucial because it is above all here that erroneous theories of learning and teaching can counteract the objective of improving classroom teaching and learning strategies. Also, the popularity of the learning type theory gives informative insight into how learning at school obviously often takes place.

By the way: The fact that some authors even refer to the learning type theory in publications on current constructivist didactics is from the point of view of subject-oriented learning almost to be expected, it draws new attention to the respective publications but it is to be criticized.

The more you study the statements on how taking learning types into consideration enhances learning effectiveness (including related pedagogic principles, see below) the more it strikes one that the soundness of this seemingly plausible correlation is normally assumed without further examination – and presents itself as common sense particularly in elementary school pedagogy but also in didactics of the sciences and others.

1. The Learning Types According to Vester

   a) In essence, the learning type theory goes back to Frederic Vester. Therefore the following presentation of the theory refers to an extract (p 49-52) of the book “Denken, Lernen, Vergessen” (Learning, Thinking Forgetting) by Vester, that was published in 1998 in already the 25. edition– nota bene as a new edition revised

[24]
and updated by the author. The book was first published in 1975. An educational film of the same contents can still be lent from most municipal media centres even today.

b) Let us take an authentic example of Vester to explain what learning types are: In his example the aim is to learn the physical law “pressure equals force divided by area”. The correlation between the physical quantities is to be *grasped* that is, the law should not just simply be learned by heart.

c) According to Vester this content – As, by the way, any material “independent of its degree of difficulty” can be learned in different ways suitable for the different learning types of learners. Vester differentiates between 4 types:

i) Learning Type 1: Auditive Learning (“by listening and speaking”).
ii) Learning Type 2: Visual Learning (“through the eyes, by watching”).
iii) Learning Type 3: Hepatic Learning (“by touching and feeling”).
iv) Learning Type 4: Learning through the intellect.

d) This kind of classification calls for a critical analysis. Learning type 1 to 3 differ in the kind of receptive channel (sensory mode) for an information. Logically the fourth type of learning does not fit into this category although this is exactly what Vester maintains when writing: “The content of the explanation is the same in all four cases: large area, small pressure; small area, big pressure. The only difference lies in the receptive channel.”

e) By classifying learner types in this way Vester denies the intellectual effort types 1 to 3 take reserving it exclusively to learner type 4 instead. On the other hand, Vester equates the perception of a phenomenon with the capacity to make abstractions in order to explain the phenomenon, i.e. perceiving = learning or understanding.

2. The Logical Mistakes

a) In order to assess and criticize the theory it can be examined first of all in terms of its inner logic alone without comparing it to theories of the cognitive
science. The question therefore is: Can this content be understood in these different “ways of learning”?

b) **Vester Maintains:** “The greater the variety of the kinds of explanations offered and the more channels of perception are used (...), the more firmly the knowledge is stored, the more diversely it is anchored and also understood, the larger the number of pupils who understand the subject matter and will remember it later on”. Here it is needless to say that “kinds of explanation” are not identical with “channels of perception”.

c) Auditively and visually the learning content (the physical law!) can be taken in as a mere sequence of letters and/or sounds (that is, in any form of verbal coding), hepatically this can be done through Braille at the utmost. All this is merely the basis for learning or understanding information. From this point of view learning type 4 follows 1-3 and is indispensable for the understanding and, the other way around, the sheer information as a sequence of letters or sounds needs to find its way into the head of the learner in the first place.

d) If you look more closely into Verster’s text you can read about the *auditive learning type* that here “misunderstandings are sorted out via argument and counter-argument, simple examples and drawings are devised by the learners themselves”. Without doubt this achievement requires a cognitive effort. Moreover, this raises the question: Are handmade drawings not “hepatic” in Verster’s sense?

e) As regards the *visual type* it reads as follows: “Everybody knows from experience that a pointed and sharp nail penetrates the wall much easier than a blunt one. But why? Because of the enormous increase of pressure due to a minimal area of contact.” You can perhaps see with your own eyes that a sharp nail penetrates the wall faster than a blunt one but the additional explanation is the result of cognitive processing. The explanation cannot be seen, no matter how hard you try.

f) As to the hepatic type it says: “He or she takes two pencils, one with the point up, the other with its point down. Pressure of the thumb on the flat surface. No
reaction. The same pressure onto the point. It hurts. Why? Because the point increases the pressure considerably due to its tiny area of contact and most noticeably so."

g) Apart from the fact that here the difference to the hammer and nail experiment does not become obvious at all, the thumb itself most certainly does not deliver the explanation for the phenomenon "pain by point of pencil" but again this is gained through intellectual processing. The law cannot be deduced from the action itself. The intellectual content of the formula can neither be seen nor touched. Therefore you cannot evade the intellectual effort to work out this content theoretically.

h) Grasping something abstractly is no alternative to touching it. Or else this would raise the question: If pupils cannot touch the subject matter will there is no way for it to enter their heads? But how then would it then be possible to learn grammar or understand the correlations in world economy or between AIDS and the immune system or the process of photosynthesis or the effects of drugs? Understanding any type of abstraction would be impossible. Thinking, feeling and acting are neither different options nor different methods of learning and understanding, they are completely different categories.

i) The fourth type of learner is said to grasp the formula in a more “abstract verbal way” i.e. “from the formula itself - even if it is full of abbreviations and ‘units’ as is the case here.” This enormous ability calls for an explanation because the formula (this representation of the formula is currently uncommon) in Verster's text looks as follows

a. $10^6\text{ dyn}$

b. 1 bar = """"

c. $\text{cm}^2$

j) The learning type theory as far as auditive and visual perception is concerned might apply when it comes to merely memorizing and reproducing names, dates, facts because they do not require comprehension or touching. All memo
techniques serve memorizing only a concept of the subject matter is not necessary at all.

k) Yet a physical law in the form of a formula normally aims at its application. And that requires insight.

l) Verster's learner types 1 and 2 possibly memorize the formula (mere mental effort) without understanding it. Type 3 does not learn anything at all due to a total lack of the capacity for abstraction including the verbal coding of the formula. Also, linking the action with the formula can fail if its meaning is not clear to the learner.

3. **Evidence from Cognitive Science**

a) Can cognitive science perhaps give evidence for or against such a learning type theory? The term and the construct of the “learning type” according to Vester can understandably not be found in cognitive science literature and discussion a fact supporters of this theory seem to be totally oblivious to and is therefore evoking astonishment.

b) For a typological classification of learners the term learning styles is used at best: It is a cognitive style when a person makes use of similar strategies in different situations. Strategies in a narrow sense are stored in the memory as retrievable action plans (e.g. as a combination of tactics / techniques making up a plan for managing a problem). Cognitive learning strategies are among others repetition strategies, elaboration strategies (for the incorporation of new information into the existing knowledge structure, for example, analogies are created) or “critical examination” (e.g. thinking about alternatives to the statements and conclusions presented). It is to be emphasized that in contrast to the “learning types” described here these strategies are relatively complex constructs of knowledge gaining.

c) In addition to the logical deficiencies, Verster’s theories do not make differentiations that would have been necessary regarding cognitive science theories. Since Verster’s example is about declarative knowledge procedural knowledge is to be ignored in the following – as it has developed into its own branch of research. Vester does not consider this differentiation. The skill to
hammer a nail into the wall is not what is supposed to be learned with Vester but the aim is a theoretical abstract understanding of a physical correlation (prepositional knowledge). Learning of how to hit a nail into the wall can hardly be achieved without doing it “hands on” that is, by merely listening, watching, touching or even “purely intellectually”.

d) First of all it needs to be emphasized that the sensory data the learner receives when hearing something from the teacher or reading a text, looking at a picture or touching something do not have any intrinsic meaning. It is the learner who attaches meaning to the sensory data in the first place. This meaning is generated within the set of ideas that determines the learner’s approach to the interpretation of the incoming sensory data. (see. Haussler et al. 1998, p. 171)

e) Let us look more closely at the visual learner type in connection with knowledge representation. The question is: Can the abstraction of the formula $P=F/A$ be represented as a mental image, e.g., in the form of “hammer/nail”?

f) In the differentiation between prepositional and visual knowledge representation it is significant that images cannot be put into a mental representation system instead of e.g. words or sentences. There is a fundamental difference between images and words or sentences. In contrast to abstract semantic or propositional representations images are analogue representations referring exclusively to visually detectable properties (also spatiality) (see. Wessells 1994, p. 294). Those properties that are not visually detectable or describe relations such as weight, family relations between persons on a photo remain unconsidered. These visually undetectable facts can also not be found in the visual representation and there is no process able of gathering such an interpretation from the image alone. (See. Rehkamper 1991, p.121).

g) The fact is: During visual perception we are able to see the surfaces of objects and their transformations directly. All the rest is neither the content of perception nor represented as a mental image. The same is true for hepatic perception where only those things can be grasped which are accessible to these particular senses, that is, which make for an adequate stimulus.

[29]
h) This is also true for the phenomenon that mental images emerge as a visualization of the problem when solutions are to be found for and only for vision and space-related problems such as tasks concerning the mental rotation of objects.

i) An other issue which evokes the use of mental images is e.g.: Think of a house you know really well (maybe the house you live or grew up in). How many windows does this house have at the front?”

j) Mental images can be scrutinized and mentally rotated the same way as can be external objects but as mentioned before for the comprehension of the abstract formula P=F/A the representation of the hammer/nail image will hardly be sufficient because comprehending is first of all an effort for meaning there-fore semantic information processing has the key role. Although representation forms were dealt with here only very briefly cognitive science as a whole does not give any evidence for the learning type theory. 4

4. The Learning Type Theory and Learning Through All Senses–Holistic and Action-Oriented?

a) The wide dissemination of the theory of learning types makes the study of this theory so relevant and necessary. Its persistent popularity is being fuelled by the current pedagogic trend of “action-oriented” and “holistic learning” as well as “learning through all senses”. Since practicing teachers do hardly or never read scientific literature (any more) according to studies (see e.g., Looss 1998) but instead rely on practice-oriented approaches, e.g. in the form of How–to literature (see below) the wide dissemination seems alarming. The impact of this theory on the concepts of learning of teachers and pupils might therefore be more relevant than scientific theories.

b) In proverbs, words of “great thinkers on education”, specialist didactics, biology schoolbooks, books on “learning how to learn”, methodology handbooks and practice guidebooks even in biology textbooks and last but not least in curricula and current pedagogic journals this kind of learning theories can be found. An overview and a small selection of references in literature and their criticism can be
found in Looss (1997). Apart from articles on the subject a look into programmes of further education for teachers is very insightful as far as the dissemination is concerned.

c) The author’s own study on students of the school subject biology (most of the 21 respondents were students at the end of the second semester summer term 1999) showed that 15 of 21 students knew the theory of “visual, hepatic, auditive learner types” and considered it as being correct. Several respondents would want to devise lessons on the basis of this theory. Also, asked previously in how far people have different learning styles (in case this was an agreed opinion at all) the respondents went mostly into these learner types and the asymmetry of the brain hemispheres (example of quote: “Children who get to see a lot learn more through visual perception while others who have read a lot learn better on a cognitive level”). In addition, there were statements such as “some people learn more theoretically, others more practically” etc.

d) The presented evidence about the dissemination of the learning type theory shows that there is a consider-able need for academic teachers to take action....

e) The attempt to differentiate in terms of terminology and contents between the learner type theory and “learning through all senses”, “holistic learning” and “action-oriented learning” seems appropriate if you intend to acknowledge one or the other aspect. For information on the historical development of the different approaches be referred to the literature indicated.

4.1 Learning Through All Senses

a) “Learning through all senses” is particularly popular in elementary school didactics and according to Segerer (1999, p. 4) it is “today more than ever an indispensable pedagogic principle”. Here, the link to the learning type construct is the most evident. Very often sensory experience, sensory perception and learning are equated with each other and Verster’s concept of the learning types is adopted (see e.g. Wendler 1998, p. 539; s.a. Zitzlsperger 1995). Also a relationship is often established here to action-
oriented teaching, as children use “their different senses when actively dealing with the subject matter (...)” (Wendler 1998, p. 541 under reference to Gudjons 1989, p 50). As an example for learning through all senses Wendler advocates that children should walk barefoot over forms of letters lying on the floor as to absorb information about the letter to be newly learned via the skin, the equilibrium as well as muscle and joint receptors.

b) The sometimes somewhat forced effort to stimulate all senses in the different lessons becomes obvious e.g. in the publication of Engelhard (1991) where by cooking international dishes during the geography lesson taste and smell are supposed to increase insights into the different countries.

4.2 Holistic Learning

a) In addition to the complexity and the multiple layers of the meaning of the term “holism” (see, e.g. Haarmann 1998, p. 64-71) you can find as regards “holistic learning” the following requirement: In delimitation to a lack of immediacy towards the subject matter caused also by ex-cathedra teaching a key demand of a comprehensive holistic education is that for active knowledge acquisition through direct engagement with the subject matter. (ibid., p. 68). “Holistic” is here understood in the sense of “hands-on” “and is thus (M.L.) supposed to lead directly to a cognitive understanding of the subject matter”. The connection to the learning type theory becomes obvious and Haarmann deliberately makes it by referring to “more recent learning psychologists such as Piaget, Aebli, Bruner and Vester”. A direct link is apparent also with 5

b) Zitzlsperger (1995) not only in the title of his book (Ganzheitliches Lernen Weltschließung Über Alle Sinne Mit Beispielen Aus Dem Elementarbereich) [Holistic learning deciphering the world by using all
senses with examples from elementary school teaching], but a direct connection to Verster’s learning types is also made. (p 188 f).

c) There are no objections against the “direct engagement with the subject matter” however, no distinction is made neither in “learning through all senses” nor in “holistic learning” the same as with the learning types as well between the mere prerequisites of learning (senses) on the one hand and the cognitive processing which is indispensable for comprehension on the other hand. Instead, “learning through all senses” etc. is viewed as an alternative to cognitive learning in the respective theories.

4.3 Action-oriented learning

a) This approach also considers itself to be an alternative to “cognition-dominated ex-cathedra teaching” (Bonsch 1998, p72; cf. also Jank/Meyer 1994, p 337f) and is at present worked out particularly by Hilbert Meyer and Herbert Gudjons. Bonsch states that there is a conglomerate of aspects the combination of which he considers inappropriate since it blurs the clarity of the concept. Action-oriented learning has “cognitive, emotional and practical aspects (the traditional Pestalozzi trilogy of head, heart and hand), is related to life and the situation, focuses on the interests of the participants, triggers responsibility, stimulates many senses, encourages social learning.” Bonsch urges to differentiate particularly between “practical learning” and “action-oriented learning”. Action-oriented learning includes and should always do so cognitive elements apart from practical activities. This is also pointed out by Jank/Meyer (1994, p. 338) in anticipation of critical objections which might find in this notion acting to be a surrogate of thinking. But how does the cognitive effort manifest itself here? Planning, execution, result and evaluation of the action comprise cognitive elements: “Thinking, discussing, planning, managing the execution, evaluating the results” (Bonsch 1998, p. 72). This is a highly abstract form of action which is not to be carried out without thinking at the same time. Put aside the question of what the actual objective of the

[33]
learning process is supposed to be (particularly since the focus of the lesson is supposed to be on making an actual product in the course of the activity) and of how it is supposed to be possible to understand abstractions (even from the action that is in fact being carried out) in an action-oriented way, it is only under the premise of cognitive processing that “action oriented learning” can be delimited from mere action for the sake of action. Various publications show that this objective is often only a lip service and that the term “action-oriented” has become a buzzword narrowing it down to practical action only. As already Jank/Meyer (p 354) have stated, this is a more “naïve emphatic” way of using the term, insinuating that its use already guarantees the quality of the teaching concept labelled that way.

b) Jank/Meyer are quite frank when admitting the intention to fight last but not least boredom (of pupils) and problems in maintaining discipline (of teachers) in the classroom with action-oriented instruction. As mentioned before and amplified below, fun in class cannot substitute sometimes rather tiresome reflection.

c) The boundaries to “holistic learning” are blurred because according to Bonsch (1998, p. 73) and Jank/Meyer (1994, p. 338) the underlying concept of “action-oriented learning” aims at “holistic learning allowing the learner to fully engage as a person (head – heart – hand – all senses) in the learning process.”

d) So it is obvious that in the literature there is no clear distinction between the terms except for some minor deviations or additions if any. Consequently, the lines of argumentation presented here need to be analyzed just as critically. The presented criticism of the learning type theory can be applied to related approaches that argue similarly.

e) Due to the undiminished popularity of an argument - often alleged as scientifically proofed against the criticism of learning types and related approaches the following may be added: According to supposedly empirical studies (the source of which cannot be identified, however) we remember 10% of what we have read, 20% of what we have heard, 30% of
what we have seen, 50% of what we have heard and seen, 70% of what we voice ourselves and 90% of what we carry out ourselves.

f) The criticism of this popular listing (which comes up almost just as often in relation to learning and “action-orientation” as the learning types) can in parts follow similar lines of argumentation as the criticism of Vester's theory. Apart from the fact that there is no way of identifying how these findings were gained they obviously seem to deal with the total sets of information which eventually settle in our long-term memory.

g) Independent of whether we want to remember or do not. The act of remembering seems also to be independent of the degree to which the information is processed and the significance attributed to it. Moreover, these findings can only be regarded as convincing if pure memorizing is equalled with learning independent of whether content has been understood. The specification of percentages merely suggests that there is a link particularly the one that theoretical insight can best be gained through practical experience. Here, a short reference to people who have obviously not learned from experience should suffice as an objection.

h) Some comments need to be made regarding the often not only in biology didactics cited connection between “learning through all senses” and experimenting in class. You could also point out “action-orientation” here which is regarded just as “holistic learning” and is therefore considered to be particularly effective. So the statement that experiments alone can facilitate understanding with pupils should be met with scepticism. There is no doubt, that a lesson during which the pupils can do practical work is more fun for them and keeps them motivated. The appeal of event-oriented hands-on museums or interactive science centres speaks for itself - as far as fun is concerned.

i) Learning success occurs however only if the pupils themselves draw the right conclusions from the experiment. Then it is more likely that they remember the learning matter than if they were only just told the result. Learning through reflection! But also incorrect conclusions might be drawn
from experiments. Again, the error lies also in the thought and not in incorrect vision, feeling and touching or hearing.

j) Gaining chemical, biological or other insight from experiments is based on a necessary interest in these in-sights that is separated from the actual doing and is based also on relevant previous knowledge and last but not least - on cognitive processing. Learning is more than the undoubtedly necessary use of the senses (e.g. in the experiment) and more than the sensory experience itself. Explanations require the very distancing from the immediate experience. The efficiency of learning depends on the cognitive activities of the learner rather than on the practical ones.

k) There are hardly any grounds for the expectation or hope that practical doing motivates pupils to abstract thinking and that they subsequently are eager to learn and understand what the law says. Everybody makes a decision on what he or she wants to learn, remember or recall. This requires subjective significance and interest as well as a considerable degree of attention. There is no way you can force this preparedness for learning from anybody.

5. Classroom Learning – Only Storing and Reproducing?

a) The popularity of Verster’s learning theory and its variants can give some insight into the way in which pupils’ minds are strained during classroom learning.

b) Since pupils learn in order to get good marks, “understanding” of a thought expressed (by the teacher) is in fact often limited to its reproductability. Examining an idea in terms of its plausibility is not part of the agenda.

c) Very often the forms of acquiring knowledge are limited to the use of the memory even as regards subjects where this is not appropriate. It is true that learning vocabulary like for instance the English word for table and chair can only be memorized not deduced. Understanding and remembering are key differences already in math. This is what pupils experience in their next test at the latest if they
have learned a formula or a mathematic proof by heart rather than having tried to really understand it.

d) Since in standard tests more in-depth knowledge is not required but much rather the fast and reliable reproduction of facts and solution patterns pupils might even be more successful when adopting the less demanding surface strategies to get a good mark. Therefore in-depth mental processing does not necessarily generate better classroom performance (in the form of marks). The requirement of the learning environment determines the learning orientation.

e) These assumptions about the current requirements with respect to classroom performance match the findings of the TIMS-Study (cf. Baumert et al. 1997). It is significant that German pupils are relatively effective in solving routine tasks and reproducing factual knowledge. They fail, however, in solving more complex, cognitively demanding tasks requiring conceptual understanding or flexible application of knowledge.

f) Ledge. In addition, deficits in problem-solving as well as scientific thinking and reasoning skills become apparent.

g) There are hardly any surveys to date on the subjective theories teachers and pupils hold or on the relation-ship between their everyday concepts about learning and scientific learning theories. A study by Schletter and Bayrhuber (1998) on pupils’ ideas about the subject “learning and memory” and its neurobiological and psychological principles provides significant hints which support hypotheses about the kinds of requirements of classroom learning. Individual results of the study showed that concepts of what classroom learning is about are characterized as remembering (storing) and reproduction (unmodified reproduction) of knowledge (scientific insights).

h) When asked how they prepared for written tests, respondents claimed to apply mainly reproductive learning strategies. Only very few take the effort to restructure actively the contents to be newly learned and, consequently, make understanding easier. Interestingly, information processing with the respondents (n = 20;
specialized course biology, upper secondary level) is confined to sorting and storing of what is absorbed through the senses: “Accordingly, in the view of almost two thirds of the pupils information flows directly from the outside world via the sense organs into the short term memory and afterwards into the long-term memory” (p. 26). Last but not least the experiences pupils make with school tests may well be responsible for their belief that further processing of information through thinking processes might be less important for learning since the reproduction of learned contents seems to be key for passing tests.

i) In addition, the concept of memory molecules as an information store described also in this study is prevalent - and can still be found in the updated 25. Edition of “Denken, Lernen, Vergessen” [Learning, Thinking Forgetting] (Vester 1998).

j) From these analyses the popularity can be explained of Verster’s theory and of books on “learning to learn” containing mainly memo techniques as well as details about the management of resources. And the reader does not expect anything but tips and tricks of how to memorize as much information as possible in such a way as to reproduce it “blindly” at least until the next test. This is where these books can actually be of real assistance (Useful books regarding this and can do without learning types are e.g.: Adl-Amini 1989, Endres et al. 1994, Miller 1993).

k) Also teachers know that this is the way how things are. However, the selection function of schools is considered by many critical pedagogues as an unpleasant side effect rather than the yardstick of learning at school. And so they try hard to exercise as much justice as possible. To this end the learning types seem an apt and just tool. A lot of effort is put into experiencing and having fun and stimulating every sense that is learning through all senses. And it is not surprising that an olfactory learning type can be found in literature.

l) The differences in the achievement levels that still occur call for an explanation. But be it as it may: In any case as a teacher your mind can be at rest because you know about the different “basic patterns” of perception and learning and you have taken the effort of “broadcasting” on different “wavelengths”. However, hardly
any criticism of this theory can be heard and of pupils’ learning effort that aims only at achieving the required marks.

m) Let us assume the good intentions of teachers to help pupils and to do justice to all pupils. In view of what effects these theories might have on pupils their wide dissemination is very disconcerting if not disastrous indeed: Must pupils not be completely disheartened if they are not able to see how biological, physical and other knowledge grow quasi “naturally” from practical action although they are told that this is exactly the case? How will the pupils who are most reflective not come to the conclusion that they are not talented enough to acquire this knowledge? Do pupils not have to despair of the fact that they cannot think of any action at all which might enable them to at least remember the knowledge they have not understood?

6. Alternatives

a) The question is: What promotes understanding-oriented knowledge acquisition? Unfortunately there has been no explanation to date of precisely how understanding of learning contents comes about? According to the present standard of knowledge there is no simple structure and also no ideal way of promoting efficient learning and thinking (cf. Reusser 1998, p. 129).

b) All conclusions drawn from empirical studies for possibly more effective forms of teaching can only be mere indications whose effectiveness needs to be examined in the overall context. Approaches to promoting an understanding-oriented knowledge acquisition need to take into account that it is an active, motivated, constructive, in parts a self-directed process which is embedded in a particular situation and social context.

c) As regards the individual determinants of school performance it is the expertise research of the past years and the latest constructivist approaches in particular which consider task-specific and field-specific previous knowledge and/or pre-lesson concepts to be most predictive (cf. Helmke/Schrader 1998, p 60; Duit/Treagust 1998). On the whole cognitive, volitional and emotional-
motivational characteristics of a person concur in the individual construction of knowledge.

d) A *resume of the findings of the research*, models and theories on making schooling more effective with regard to teaching that focuses on understanding shows that apart from taking into consideration pre-lesson knowledge, influencing the interest and motivation has the greatest impact as a prerequisite of deeper processing and as a function of personal and situation-related factors. (cf. Krapp 1993, Krapp 1998).

e) As regards *constructivist learning environments* (according to an adaptive instruction model) there are four criteria (cf. Duit 1995) which at the same time can be regarded as promoting motivation: The lesson should...

f) ... give the pupils opportunities for meaningful and self-directed working and for thoughts independent of teachers and other pupils (i.e. “allow space for individual knowledge construction”)

g) ... give the pupils the opportunity to link their previous knowledge and their previous experiences with the matter to be newly learned (that is also to take the self-explanatory effect into account)

h) ... give the pupils the opportunity for interaction to negotiate meanings and find consensus

i) ... give the pupils opportunities to experience learning as a process allowing them to solve problems they personally find difficult (that is, to enhance self-efficiency in a particular field, e.g. by setting appropriate tasks, by developing efficient learning and problem solving strategies).

j) Moreover, pupils ought to build their knowledge from complex, realistic problems in authentic situations (keyword: situated learning). By creating multiple contexts the learners should be able to transfer their knowledge in a flexible way to other problems. Through multiple perspectives the learners should be enabled to view the same problem from different angles considering different aspects. On the whole, the aim is to build knowledge that is understood and can be applied. This also means: linking the contents of teaching to the interests as well as the pupils’ world of experience and living and imparting knowledge, competences and skills
pupils can connect with their own practical life, i.e. also making use of these skills and gaining competencies (cf. also Dubs 1995, Haussler et al. 1998).

k) The problem which occurs in implementing these kinds of instruction models lies in the dramatic lack of time leading or forcing teachers to apply more direct teaching methods. The teachers are, however, neither forced to accept these circumstances without criticism nor forced to believe everything the learning type theory promises.

2.2 EMOTIONAL INTELLIGENCE

Web Pages 1 to 6 downloaded from Website http://www.equtoday.com/emotonals.html on 24th Aug., 2000, reveal the information that EQ experts, including Jack Mayer, Eric Jensen, Candace Pert, Anabel Jensen, Maurice Elias, John Steinberg and J.P. Dupreez offer new perspectives with regard to their answer towards the question ‘What are Emotions?’ And ‘differences between emotions and feelings’.

Jack Mayer states that “an emotion occurs when there are certain biological, certain experiential, and certain cognitive states which all occur simultaneously”. He also maintains that, “there are emotions which are more biologically oriented and then there are complex emotions which are saturated with thoughts and cognition”.

Anabel Jensen is of the opinion that, “three are a hundred or perhaps a thousand other emotion or gradations, created by the mixing, blending and overlapping of the basic ones”.

According to Maurice Elias, “emotions help to keep us on the right track by making sure that we are led more by that cognition”.

Candace Pert says that, “emotions are the glue that holds the cells of the organism together”.

Karen Mc Cown asserts that, “our emotions are shaped by our beliefs-by what we tell ourselves.”
Some important books, research papers, research works and articles which contain the theoretical narrations, research findings, thoughts and ideas of various theorists and researchers with regard to the variable Emotional Intelligence are as follows:

1. **Salovey I, P & Mayer, J.D. (1990)**, Emotional Intelligence, Imagination, Cognition and Personality 9 pp. 185-211.


7. **Salovey, P. & Shuyter, DI. (1997)**, Emotional Development and Emotional Intelligence: Educational Implications available online via *Amazon.com*


[42]


17. Chaudhary Deeksha (2002), Study of Self-Destructive Intelligence Syndrome and Emotional Intelligence of University and College Teachers in Relation to Gender and Academic Factors, Ph.D. (Education) Dissertation, Kumaon University, Nainital.


21. **Garia, Hem Lata (2006)**, Study of Intellectual Ability, Emotional Intelligence and Spiritual Intelligence of Post-Graduate Students in relation to their gender, academic stream and academic attainments.


23. **Kumar, M.**, Study of Emotional Intelligence and satisfaction with life of Education For All (EFA).

24. **Verma, Pratima**, Study of Happiness, Emotional Intelligence and Spiritual Intelligence of Primary and Secondary teachers in relation to their gender and teaching experience.

25. **Mehra, Amita**, Study of Spiritual Intelligence and Emotional Intelligence related abilities of teacher trainees in relation to educational factors.


The print media has enthusiastically taken the novel concept of Emotional Intelligence. A list of some of the important articles, which appeared since 1997 in the leading magazines and widely circulated newspapers, has been presented below:


Tewary, Mala (1999) studied identity statuses and emotional intelligence of female college students in relation to some socio-familial and educational factors.

The main conclusions arrived at by her on the basis of her research findings, are as follows:

1. The process and mechanism of attainment of identity statuses is directly related to the level of Emotional Intelligence of female college students. Identity crisis resolved students possess higher amount of Emotional Intelligence in comparison to Identity crisis unresolved students.

2. The following personality traits facilitate the path of the resolutions of various life crises.
   - A higher level of Self – Awareness.
   - Competence of Managing Emotions in others.
   - Ability to Motivate Oneself.
   - Ability to Recognize Emotions in others.
   - Ability to Handle Relationships.

3. Female college students with different economic status differ in emotional intelligence. Female college students reared up by wealthy parents are more emotionally intelligent and female college student with poor parents are lowly emotionally intelligent.

4. Female college students of highly educated parents are highly emotionally intelligent whereas the daughters of lowly educated parents are lowly emotionally intelligent.

5. Female college students differing from one another with regard to the following variables respectively do not differ in their emotional intelligence:
   - Family Size
   - Chronological Age
   - Birth Order

[46]
6. Female college students in identity achievement status differ significantly in emotional intelligence from those female college students who are in identity foreclosure status and mean emotional intelligence score of the former group is higher compared to female college students in identity foreclosed status.

7. Female college students in identity achievement status differ significantly in emotional intelligence from those female college students who are in identity diffusion status and mean emotional intelligence score of the former group is higher as compared to female college students who are in identity diffusion status.

8. Female college students in identity diffusion status. Significantly in emotional intelligence from identity moratorium status female college students

9. Female college students in identity foreclosure status do not differ significantly in emotional intelligence from diffusion status female college students.

A study titled 'Study of Emotional Intelligence of adolescent students in relation to their achievement in mathematics, academic stream and gender' was conducted by Pandey, M.K., in the year 2000. The main conclusions of the study are as follows:

This study attempted to make a comparative investigation of the emotional intelligence of adolescent students in relation to their achievement in mathematics, academic stream and gender. The statistical analysis of the data yielded a number of results and on the basis of these results, some important conclusions were arrived at. These conclusions have been mentioned below:

1. Adolescent students who achieve high marks in mathematics possess more emotional intelligence as compared to those adolescents who achieve low mark in mathematics. It means that very high achievement in mathematics is associated with higher level of emotional intelligence and very low achievement in mathematics is associated with lower level of emotional intelligence.

2. The above conclusion also stands good when female high achievers and female low achievers in mathematics were compared for their mean emotional intelligence.
3. Gender wise differences are not associated with corresponding difference in emotional intelligence. It means that, as is the case with general academic intelligence, female students and male students do not differ in their emotional intelligence. Hence, if may be concluded that emotional intelligence is a gender free construct.

4. Students who pursue different subject streams do not differ in their emotional intelligence. It means that differences in subject streams are not associated with differences in emotional intelligence.

Another study conducted by Devendra Kumar, in the year 2001 titled ‘Study of Emotional Intelligence of Primary School Teachers in relation to their Gender, Age, Caste, Teaching Experience and School Locality’, concludes as follows:

1. Gender wise groups of primary school teachers do not differ in their emotional intelligence and its five dimensions respectively.

2. Age wise groups of primary school teachers do not differ with regard to the variable ‘Self-Awareness’.

3. Age wise groups of primary school teachers do not differ with regard to the variable ‘Managing Emotions’.

4. ‘Old Teachers’ from rural areas are higher in emotional intelligence than ‘Young Teachers’ from rural areas.

5. ‘Old Teachers’ from rural areas recognize emotions in others more appropriately as compared to ‘Young Teachers’ from rural areas.

6. ‘Old Teachers’ from rural areas handle relationships more efficiently as compared to ‘Young Teachers’ from rural areas.

7. ‘Young Teachers’ from urban areas motivate themselves more successfully as compared to ‘Old Teachers’ from urban areas.

8. Caste wise groups of the Hindu teachers do not differ in their emotional intelligence and its five dimensions respectively.

9. Differences in teaching experience are not associated with differences in ‘Self-Awareness’ of Primary School Teachers.
10. Differences in teaching experiences are not associated with differences in the ability to recognize emotions in others in case of Primary School Teachers.

11. Primary School Teachers handle relationships almost similarly irrespective of the differences in their teaching experience.

12. Teaching experience wise groups of Primary School Teachers from urban areas do not differ in emotional intelligence and its five dimensions respectively.

13. Primary School Teachers working in rural areas and urban areas do not differ with regard to the five dimensions of emotional intelligence respectively.

14. Primary School Teachers working in rural areas are higher in emotional intelligence as compared to the Primary School Teachers working in urban areas.

15. Gender, age, caste, teaching experience and school locality wise differences respectively are not associated with differences in the process and mechanism of ‘Knowing One’s Emotions’ in case of the Primary School Teachers.

*Tewary K.K.* conducted a study in the year 2001 submitted to the School of Management studies, Indira Gandhi National Open University, entitled ‘Study of Emotional Intelligence and adaptability of Employees of Private Sector in relation to their gender and professional experience.’ On the basis of the statistical analysis of the data, a number of results were obtained to attain the various objectives of the study. These results led the researcher to attain some important conclusions, which are mentioned as under:

1. Gender wise groups of employees of Sony India Pvt. Ltd. do not differ in their emotional intelligence it means that gender; on its own does not exert considerable influence on emotional intelligence with regard to employees of Sony India Pvt. Ltd.

2. Professional experience wise groups of employees of Sony India Pvt. Ltd. do not differ in their emotional intelligence. It means that professional experience on its won does not exert considerable influence on emotional intelligence with regard to employees of Sony India Pvt. Ltd.
3. Gender wise groups of employees of Sony India Pvt. Ltd. do not differ in their adaptability. It means that gender, on its own, does not exert considerable influence on adaptability with regard to the employees of Sony India Pvt. Ltd.

4. Professional experience wise groups of employees of Sony India Pvt. Ltd. do not differ in their adaptability. It means that professional experience on its won doesn’t exert considerable influence on adaptability with regard to the employees of Sony India Pvt. Ltd.

5. Emotional Intelligence and adaptability bear a positive and significant relationship for employees of Sony India Pvt. Ltd.

6. The coefficients of correlation between Emotional Intelligence Scale Scores and Adaptability Questionnaire scores of male and female employees of Sony India Pvt. Ltd. do not differ significantly.

7. Professional experience wise three groups of the employees do not differ from one – another with regard to value of coefficients of correlation between Emotional Intelligence Scale Scores and AQ Score.

Joshi, C.M., in the year 2001, conducted a study entitled ‘Study of Emotional Intelligence of Bank Officers in relation to their Age, Caste, Area of residence, Educational Qualification & Basic Pay.’ The main conclusions of the study are as follows:

1. Age–wise groups of the Bank Officers do not differ in their emotional intelligence.

2. Caste wise groups of the Bank Officers do not differ in their emotional intelligence.

3. Bank officers residing in hilly areas manage their emotions more properly as compared to the bank officers living in plains.

4. Bank officers residing in hilly areas motivate themselves more appropriately as compared to bank officer living in plains.

5. Areas of residence wise groups of bank officers do not differ in their emotional intelligence.

[50]
6. High Educational status Bank officers process more distinct self awareness as compared to low educational status Bank officers.

7. High Educational status Bank officers manage their emotions more properly as compared to low Educational status Bank officers.

8. Low Educational status Bank officers recognize emotions in others more appropriately as compared to high educational status bank officers.

9. Educational status was groups to the bank officers do not differ in their emotional intelligence.

10. Bank officers with higher basic pay possess more distinct Self - Awareness as compared to the bank officers with lower basic pay.

A report on research findings with regard to the Emotional Intelligence competencies, prepared for the Consortium for Research on Emotional Intelligence in Organizations by Cary Cherniss, contains several research findings. These emotional competencies include Assertiveness, Empathy, Happiness and Emotional Self Awareness. These findings have been mentioned below:

1. The US Air force used the EQ-I to select recruiters (the Air Force’s Front-line HR Personnel) and fond the most successful recruiters scored significantly higher in the emotional intelligence competencies of Assertiveness, Empathy, Happiness and Emotional Self Awareness. The Air Force also found that using emotional intelligence to select recruiters, they increased their ability to predict successful recruiters by nearly three-fold. The immediate gain was saving of $ 3 million annually. These gains resulted in the Government Accounting Office submitting a report to congress, which led to a request that the secretary of Defence order all branches of the assumed forces to adopt this procedure in recruitment and selection. (The GAO report is titled, ‘Military Recruiting: The Department of Defence could improve its Recruiter Selection and Incentive Systems’, and it was submitted to the congress on January 30, 1998. Richard Handley and Reuven Bar-On provided this information).
2. Experienced Partners in a multinational consulting firm were assessed on the Emotional Intelligence competencies plus three others. Partners who scored above the median on 9 or more of the 20 competencies delivered $1.2 million more profit from their accounts than did other partners a 139 percent incremental gain (Boyatzis, 1999).

3. An analysis of more than 300 top level executive from fifteen global companies showed that six emotional competencies distinguished stars from the average: Influence, Team Leadership, Organizational Awareness, Self – Confidence, Achievement Drive, and Leadership (Spencer, L.M. Jr., 1997).

4. In jobs of medium complexity (sales clerks, mechanics), a top performer is 12 times more productive than those at the bottom and 8.5 percent more productive than an average performer. In the most complex jobs (insurance sales people, account managers), a top performer is 127 percent more productive than an average performer (Hinter, Schmidt & Judiesh, 1990). Competency research in over 2000 companies and organizations worldwide suggests that about one third of difference in productive performance is due to technical skill and cognitive ability while two-third is due to emotional competence (Goleman, 1998). In top leadership positions, over four-fifths of the difference is due to emotional competence.

5. In a national insurance company, insurance sales agents who were weak in emotional competencies such as self-confidence, initiative and empathy sold policies worth $114,000 (Hay/MC Ber Research and Innovation Group, 1997).

6. In a large beverage firm, using standard methods to hire division presidents, 50% left within two years, mostly because of poor performance. When they started selecting based on emotional competencies such as imitative, self-confidence, and leadership, over 6% left in two years. Furthermore, the executives selected based on emotional competence were fare more likely to perform in the top third based on salary bonus for performance of the divisions they led: 87% were in the top third. In addition, division leaders with those competencies outperformed their targets by 15 to 20 percent. Those who lacked them under performed by almost 29% (MC Clelland, 1999).
7. Research by the Centre for Creative Leadership had found that the primary causes of derailment in executives involve deficits in emotional competence. The three primary ones are difficulty in handling change, not being able to work well in a team, and poor interpersonal relations.

8. After supervisors in a manufacturing plant received training in emotional competencies such as how to listen better and help employees resolve problems on their own, lost-time accidents were reduced by 50 per year to 3 per year and the plant exceeded productivity goals by $250,000 (Pesaric & Byham, 1996). In another manufacturing plant where supervisors received similar training production increased 17 percent. There was no such increase in production for a group of matched supervisors who were not trained (Porras & Anderson, 1981).

9. One of the foundations of emotional competence – accurate self-assessment was associated with superior performance among several hundred managers from 12 different organizations (Boyatzis, 1982).

10. Another emotional competence, the ability to handle stress, was linked to success as a store manager in a retail chain. The most successful store managers were those best able to handle stress. Success was based on net profits, sales per square foot, sales per employee and per dollar inventory investment (Lush & Serpeucci, 1990).

11. Optimism is another emotional competence that leads to increased productivity. New salesman at Met Life who scored high on a lest of “learned optimism” sold 37 percent more life insurance in their first two years than pessimists (Seligman, 1990).

12. A study of 130 executives found that how well people handled their own emotions determined how much people around them preferred to deal with them (Walter V. Clarke Associates, 1997).

13. For sale reps. at a computer company those hired based on their training than those hired on other criteria (Hay/MC Ber Research and Innovation Group 1997).

14. At a national furniture retailer, sales people hired based on emotional competence had half the dropout rate during their first year (Hay/MC Ber Research and Innovation Group, 1997).
15. For 515 senior executives analyzed by the search firm Egon Zehnder International, those who were primarily strong in emotional intelligence was more likely to succeed than those who were strong in either relevant previous experience or I.Q. In other words, emotional intelligence was better predictors of more specifically; the executive was high in emotional intelligence in 74 percent of the successes and only in 24 percent of the failures. The study included executives in Latin America, Germany and Japan and the results were almost identical in all three cultures.

16. The following description of a “Star” performer reveals how several emotional competencies (noted in italic) were critical in his success; Michael Iem worked at Tandem Computers. Shortly after joining the company as a junior staff analyst, he became aware of the market trend away from mainframe computers to network that linked workstations and personal computers (Service Orientation). Iem realized that unless Tandem responded to the trend, its products would become obsolete (Initiative and Innovation). He had to convince Tandem’s managers that their old emphasis on mainframes was no longer appropriate (Influence) and then develop a system using new technology (Leadership, Change, Catalyst). He spent four years showing off his new system to customers and company sales personnel before the new network applications were fully accepted (Self Confidence, Self Control, Achievement Drive)

(From Richman, L.S., “How to get ahead in America”, May 16, 1994, pp. 46-54)

17. Financial advisors at American Express whose managers completed the Emotional Competence training program were compared to an equal number whose managers had not. During the year following training, the advisors of trained managers grew their business by 18.1% compared to 16.2% for those whose managers were untrained.

A research paper titled “Dynamics of Emotional Intelligence and socio-economic factors: A study” by Pandey, T.C. & Joshi, Rambha has been published in the Proceedings of the State Level Seminar on Opportunities and Scope for research in Government Colleges, March 16-17, 2007 organised by LSM Govt. Postgraduate College Pithoragarh (Uttarakhand).
2.3 INTELLECTUAL ABILITY

Standard Progressive Matrices Test developed and validated by Raven & others (1992 version) is a well known non-verbal and culture-fair intelligence test. Researchers have extensively used it. Some of the researchers of this region have also used it for their research endeavours. Joshi, L.M. (2002) studied the intellectual ability of students at the tertiary stage of education. Joshi H.C. (2002) measured the intellectual ability of female adolescent student. Deolal G.N.,(2004) studied the intellectual ability of adolescent students. Sah, Richa, (2005) measured the intellectual ability of Primary School Children. Garia, Hemlata (2006) measured the intellectual ability of post-graduate students.

The references which has been prepared on the basis of the findings downloaded from the Internet sites are-


The purpose of this study is to examine the relationship between intellectual abilities and personality in predicting intelligent behavior, operationalized as good decision-making practices. This examination considers certain personal characteristics that are hypothesized to lead to intelligent behavior, namely personality, emotional intelligence and subjective well-being. The study aims at understanding how such personal characteristics influence decision making. It was hypothesized that the relationship between intellectual abilities and decision making would be mediated or moderated by the personal characteristics mentioned previously. Ninety-seven participants took tests that assessed these factors. The analysis of the data revealed no significant correlation between intellectual abilities and decision making, nor was there a correlation between any of the personality factors and decision making or intelligence. It is suspected that the homogeneous sample did not allow for enough variance to show any correlation. Methodological corrections are suggested for future studies.

[55]
A Research Article “Latent Ability” Grades and Test Scores Systematically Underestimate the Intellectual Ability of Negatively Stereotyped Students by Gregory M. Walton and Steven J. Spencer, Stand for the University and University of Waterloo.

Past research has assumed that group differences in academic performance entirely reflect genuine differences in ability. In contrast, extending research on stereotype threat, we suggest that standard measures of academic performance are biased against non-Asian ethnic minorities and against women in quantitative fields. These bias results not from the content of performance measures, but from the context in which they are assessed from psychological threats in common academic environments, which depress the performances of people targeted by negative intellectual stereotypes. Like the time of a track star running into a stiff headwind, such performances underestimate the true ability of stereotyped students. Two meta-analyses, combining data from 18,976 students in five countries, tested this latent-ability hypothesis. Both meta-analyses found that, under conditions that reduce psychological threat, stereotyped students performed better than non stereotyped students at the same level of past performance. We discuss implications for the interpretation of and remedies for achievement gaps.

Aspects of Intelligence by Andrew M. Colman

Individual Differences and The Basics of Intelligence Testing

People differ from one another, not only physically but also psychologically. Some people are self-assertive while others are submissive, some are persevering while others are fickle, some are outgoing while others are shy, some are trusting while others are suspicious, and so on. Allport and Odbert (1936) carried out a dictionary search and found 4500 distinct adjectives in the English language denoting psychological differences between people. Each of these adjectives relates to a personality trait, a more or less consistent pattern of behavior that a person possessing the trait would be likely to display in certain circumstances. When we describe someone as shy, for example, we implicitly assume that he or she would probably show signs of embarrassment when meeting
strangers. The study of individual differences in psychology arises from the fact that different people do behave differently, in ways that are to some degree consistent and predictable, not only when meeting strangers, but also in many other circumstances. The ancient Greeks were the first to notice these differences and to attempt to explain them. Their doctrine of the four temperaments, which was widely accepted for many centuries, sought to explain individual differences in terms of the mixture of four fluids or humors in people's bodies. Optimistic or sanguine people were thought to have in their bodies a predominance of blood (sanguis), depressive or melancholic people an excess of black bile (melaina chole), short-tempered or choleric people an excess of yellow bile (chole), and apathetic or phlegmatic people a predominance of phlegm (phlegma). Although the physiological basis of the doctrine of the four temperaments was undermined by biological research during the Renaissance, the classification has survived in a modified form in some modern personality theories. This is discussed in greater detail in Chapter 8. The first systematic study of individual differences using modern research methods was Francis Galton's study of intelligence in England in 1884. Since then psychologists have devoted particular attention to individual differences in intelligence and thinking. These differences have been more thoroughly investigated than any others in psychology, partly because of their uniquely important effects on people's educational prospects and prospects in life generally and partly because of their controversial social implications. In this chapter, some of the fundamental ideas and research findings related to individual differences in intelligence and thinking will be discussed. This will provide you with an introduction to one of the most important classes of individual differences in psychology.

- **Modern Psychometric Approaches to Intelligence**

Psychometrics (from the Greek psyche, meaning ‘mind’, and metron, meaning 'measure') focuses on the measurement of intelligence. Psychometric comparisons between people with different IQ scores have dominated the study of intelligence ever since the turn of the century. Research into the nature of
intelligence and the psychological processes involved in thinking were rather neglected until comparatively recently, and some of the developments in this area will be discussed in Section 5. In 1916, Lewis Terman of Stanford University translated and adapted the Binet-Simon scale for use in the United States, and the Stanford-Binet scale. As it became known, was the prototype of nearly all subsequent IQ tests. As we saw in Section 1.3, in constructing tests for children, Binet had used the independent criterion of age as a basis for choosing suitable test items. This was a reasonable thing to do because older children are obviously better than younger children at following instructions, exercising judgment and solving problems. However age cannot be used as an independent criterion of intelligence in constructing tests for adults as we saw in Section 1.4, and the problem was one of how to select test items which would stretch the abilities of adults and thus reflect their true level of intelligence. Psychologists solved this problem simply by extending or extrapolating the tests. Terman, for example, included a vocabulary subtest in his Stanford Binet scale and used the method of extrapolation to make it applicable to adults. When testing children, he found that 6-year-olds could generally define common words like orange, older children could define less common words like lecture, and only teenagers could define uncommon words like philanthropy. He therefore extended or extrapolated this scale so that it could be used with adults by including very uncommon words like sudorific (which means sweat-producing). A similar method of extrapolation can be used with other types of test items. The commonsense assumption is that intelligent adults should be able to cope with more difficult items than less intelligent adults. The Stanford Binet scale is still used by researchers and educational psychologists. The most recent version of it, published in 1985, is unusual among IQ tests in so far as it is explicitly designed to minimize sexual and ethnic bias in its questions.

- The Nature-Nurture Controversy

For over a century a controversy has raged in psychology over the relative contributions of heredity (nature) and environment (nurture) to intelligence. Lewis
Terman and other early American psychometricians believed intelligence to be a fixed and innate mental capacity. Many of them were members of eugenic societies which campaigned in favor of sterilization laws to prevent people with very low IQs from having children, and against immigration from southern, central and Eastern Europe. A number of sterilization laws were passed in the United States, beginning with the Act for the Prevention of Idiocy in Pennsylvania in 1905. In the state of Virginia alone, where a similar law was passed, over 7000 people with low IQs were compulsorily sterilized between 1924 and 1972. In 1912 a psychologist called Henry Goddard administered IQ tests to immigrants at the receiving station in New York harbor and reported, incredibly, that most of the Italians, eastern Europeans and Jews were 'feebleminded' (Goddard, 1913). The infamous Immigration Restriction Act of 1924 limited the number of Jewish refugees from Nazi Germany who were able to escape to the United States, as a result of which hundreds of thousands perished in concentration camps after being refused entry into the United States. The writings of Terman, Goddard and other American psychometricians, while not a direct cause of these deplorable measures, lent intellectual credibility to them (Fancher, 1985; Gould, 1981; Colman, 1987). In Britain, Cyril Burt, later to be knighted for his services to educational psychology, advised the Consultative Committee on Secondary Education in 1938 that intelligence is a fixed and hereditary factor which can be measured reliably by the time a child is 11 years old. His advice was incorporated into the Education Act of 1944 which introduced the 'eleven-plus' examination based largely on IQ tests. Children who failed the eleven-plus were denied entry to grammar schools which prepared pupils for higher education and were sent instead to academically inferior secondary modern schools, where they remained even if their intellectual or scholastic ability improved dramatically in later years. Is it true that a person's intelligence is a fixed and hereditary characteristic, as eye colour is, or is it a variable characteristic traceable to environmental influences? Stated in that way, the question is misleading for two main reasons. First, there is no necessary connection between the fixedness of a characteristic on the one hand and its genetic or environmental origins on the other, as the question implies. An
example to illustrate this is an illness called phenylketonuria. This is a purely hereditary disease caused by a single recessive gene and associated with severe mental retardation. Nevertheless, the effects of this hereditary disease can be prevented by a single environmental change: by eliminating phenylalanine, which is present in food proteins, from the patient's diet. This shows that a hereditary characteristic need not be fixed and unmodifiable. It is also the case that a fixed, unmodifiable characteristic need not necessarily be hereditary. This applies, for example, to mental retardation resulting from oxygen deprivation at the time of birth. Second, it is meaningless to pose the heredity-versus-environment question about intelligence as an either/or issue. In order to have any human intelligence a person needs a brain, and it is impossible to have a brain without inheriting the necessary genes and acquiring the food, oxygen. Parental care and other environmental requirements for its growth.

- **Race and Intelligence**

An acrimonious debate about race and intelligence began when Arthur Jensen of the University of California, Berkeley, published a paper entitled 'How much can we boost IQ and scholastic achievement?' (Jensen, 1969). Hans Eysenck of the University of London summarized Jensen's ideas in a book entitled *Race, intelligence and education* (Eysenck, 1971). The point at issue in this debate is the interpretation of the evidence showing that black Americans score about 15 points lower, on average, on IQ tests than do white Americans (Shuey, 1966; Scarr, 1981). Also, people of West Indian descent in Britain score between 5 and 13 points lower, on average, on IQ tests than do members of the indigenous white population (Mackintosh and Mascie-Taylor, 1985; Mackintosh, 1986). Jensen and Eysenck both argued that the differences are due mainly to genetic differences between the black and white races, and their writings generated angry emotional reactions. Literally hundreds of criticisms were published, and there were calls for Jensen's dismissal from the American Psychological Association. Students began disrupting his classes, and his university had to hire a bodyguard to protect him. Reactions to Eysenck in England were only slightly less extreme. Before
examining the evidence on this question, it is worth mentioning two theoretical points that are relevant to it. The first is that modern techniques of genetic analysis have shown only about 7 percent of human genetic differences of all kinds to be attributable to racial differences (Rose et al., 1984, pp. 119-27). This suggests that race, like beauty, is only skin deep and that race differences in intelligence are therefore unlikely to be due to genetic factors. The second theoretical point is that some 70 per cent of Afro Americans and Afro-Caribbean have at least one white ancestor, and 15 per cent have more white ancestors than black; the ancestry of black Americans and West Indians is, on average, 20 per cent white (Reed, 1969). These facts also make it unlikely that there are any very marked inborn psychological differences between the black and white populations. The question is empirical, though, and there is evidence that bears more directly on it. Jensen and Eysenck argued that race differences in IQ are mainly due to genetic factors, and they based this conclusion largely on evidence which they believed showed that the heritability of IQ is high. They reasoned that, if IQ differences in the general population are due mainly to heredity, then IQ differences between the black and white groups within the population must also be due mainly to heredity. The argument is now known to be invalid, as the biologist Richard Lewontin demonstrated with the following famous analogy (Rose et al., 1984, p. 18). Two handfuls of seed are taken from the same sack and planted in separate plots, which differ from each other only in that the second plot is deficient in nutrients. The plants in the first plot grow tall and those in the second are stunted.

- Cognitive Styles

We have concentrated so far on differences in overall intelligence as measured by IQ tests. However, people differ from one another, not only in their overall levels of intellectual ability but also in the way they think. Different people tend to display distinctive styles in the way in which they think, remember, perceive and generally process information, and these are known as cognitive styles. These styles affect people's functioning in virtually all areas of their lives.
Psychologists have discovered numerous cognitive styles which appear to be quite distinct from general intelligence. Research in this area deals with the manner in which people think rather than their ability to think. The various cognitive styles that have been identified relate to different modes of mental functioning rather than to different levels of mental ability. Cognitive styles develop slowly and cannot easily be modified by experience or training (Messick, 1976; Morrison, 1988). They seem to be deeply rooted in personality structures, and some of them may even be biologically based (Witkin, 1976). Research into cognitive styles has its roots in cognitive psychology and personality theory. Most of the techniques used to investigate them are therefore based on the methods of experimental and clinical psychology, in contrast to the psychometric methods used in the study of intelligence.