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## **Experiential Learning: An Interpretative Phenomenological Analysis**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author LRK designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors JS and KV managed the analyses of the study. Author JS managed the literature searches and edited the first draft. Author KV helped in correcting the statistical part of the reviewers comment. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Kolb's classifies learners as divergers, convergers, assimilators and accommodators. Do these learners adopt different learning strategies? Phenomenology is concerned with the study of experience from the perspective of the individual and is based on a paradigm of personal knowledge and subjectivity. The use of interpretative phenomenology in learning environment in the context of learning styles could possibly play a positive role in the process of providing information to students on best learning strategies that lead to success.

**Objectives:** 1) To classify 1st year medical students as divergers, convergers, assimilators and accommodators; 2) To identify the phenomena through which the divergers, convergers, assimilators and accommodators learn using a phenomenological approach; 3) To investigate the academic success of the different groups of learners during formative assessment.

**Method:** Mixed method approach. Quantitative method was employed for segregating the learners according to Kolb's learning cycle and assessing a relation to their

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academic performance. A qualitative phenomenological approach was adopted using semi-structured interviews to collect the information on the performance of accommodators. An Interpretative Phenomenological approach (IPA) was used to analyze the data of 88 first year medical students. The successful strategies were also revealed to the accommodators to improve their learning outcomes.

**Results:** A total of 88 first year MBBS students were enrolled in this study. Thirty-three students were grouped into accommodator style, 24 in diverger, 18 in converger and 13 in assimilator. Student grouped into accommodator learning style had significantly lower examination marks compared to the other groups. There were no other significant differences between the groups.

The successful strategies employed by the high achievers like regular pattern of learning, revising the learning material, making notes were shared with the low achievers/accommodators.

**Conclusion:** The positive strategies employed by the different learners were revealed by the phenomenological approach. The response of students indicates that it is the effective planning, repeated revisions, writing notes and careful, detailed efforts in learning that has led to their academic success.

*Keywords: Divergers; convergers; assimilators; accommodators; phenomenology.*

## 1. INTRODUCTION

Learning resulting in gain of knowledge, skills and attitude can be achieved by using different learning styles. A learning style or preference is the complex manner in which, and condition under which, learners most efficiently and most effectively perceive, process, store and recall what they are attempting to learn [1]. The field of learning styles is complex, with over 70 different learning styles models identified in a review. These models represent numerous assumptions such as learning styles are fixed, flexibly stable, contextually determined or even nonexistent and focus on different aspects of the learner such as cognitive personality style, informative processing style or structural preferences [2].

**Experiential learning** is the process of making meaning from direct experience. Kolb views the learning process as a context of people moving between the modes of concrete experience (CE) and abstract conceptualization (AC), and reflective observation (RO) and active experimentation (AE). Concrete Experience represents a receptive, experience-based approach to learning that relies heavily on feeling-based judgments. Abstract Conceptualization indicates an analytical, conceptual approach to learning that involves logical thinking and rational evaluation. Active Experimentation indicates an active, "doing" orientation to learning that engages greatly on doing things and reflective Observation indicates a tentative, impartial and reflective approach to learning [3,4,5]. Reliability and Validity of Kolb's questionnaire has been tested and reported by many authors [6,7]. Learning styles have also been studied in medical students using the VARK (Visual, Auditory, read-write and kinesthetic) questionnaire [8]. Kumar and Chacko [9] have used appreciative inquiry to help students to adapt to various learning styles. Appreciative inquiry (AI) is a positive change methodology for bringing about change in institutions where instead of asking, "What is the problem", it is asked, "What is working around here for you in your set-up". Through an *inquiry* which *appreciates* the positive and engages all levels of an organization (and often its customers and suppliers), AI seeks to renew, develop and build on this. Its proponents view it as being applicable to organizations

facing rapid change or growth.

**Phenomenology** is concerned with the live experience and aims to encapsulate the meanings attributed to these experiences through the interviewee telling their own story from their own perspective [10]. Interpretative phenomenological analysis (IPA) as a tool is a relatively recent approach (originating within the discipline of psychology) which is grounded in phenomenology and symbolic interactionism [11]. The latter is founded on the concept that meanings are constructed through social interaction. These meanings may not always be clear or explicit, and the researcher is required to interpret the meaning behind what each individual or group says [12]. IPA is increasingly being adopted as the approach of choice by researchers in areas of education and health. In this study, IPA is concerned with the meanings which learning experiences hold. What makes IPA interesting is that access is dependent on the researcher's own conceptions [13].

The practice of phenomenology requires careful attention to issues of identity and the role of the researcher in relation to the data [14,15,16]. Reflexivity assisted with identified the feelings of the four groups of learners towards learning including study habits, leadership qualities and preferred teaching methods. Reflexivity is an important and central part of IPA in ensuring the researcher's role in the process (asking probing questions) [17]. Tools used to support this included the use of counseling whereby the researcher had the opportunity to discuss and suggest issues relating to the good learning habits in a secure, purposeful and private environment.

**Hypothesis:** Being divergers, convergers, assimilators or accommodators will probably have different learning pattern and academic success.

**Objectives:**

1. To classify 1<sup>st</sup> year medical students as divergers, convergers, assimilators and accommodators.
2. To identify the phenomena through which the divergers, convergers, assimilators and accommodators learn using a phenomenological approach.
3. To investigate the academic success of the different groups of learners during formative assessment.

## **2. METHODOLOGY**

### **2.1 Study Process for Interviews**

**Part 1:** The study was conducted in 2011 (February to June 2011) after the second formative internal assessment of Year 1 medical students. **Briefing:** First year medical students were briefed on the research and asked to participate on a voluntary basis. Students were interviewed in the medical college (work place).

**Number of students:** Total number of first year medical students was 91. 3 students couldn't continue with the study due to illness.

**Interview guide:** Pilot testing was done on 15 physiotherapy and 15 dental students before the start of the study.

**Procedure of Interview:** The interviews were conducted in the afternoon sessions (1 pm to 4 pm) in the month of April to May 2011.

**Recruitment:** They were held according to the groups – divergers were called in first, followed by convergers, assimilators and accommodators. The absentees were again requested to come on the following days. 42 students came for interviews on their own (without a reminder) as they were keen to learn on their learning styles and to participate.

**Consent:** During the interview the students were informed of their individual style and questions were asked on their learning pattern (detailed below). All conversations were audio-recorded. The first author (female) and second author (male) conducted the interviews and asked probing /leading questions. The major techniques used by the learners were explored. 8 repeat interviews were conducted to probe into certain themes like leadership qualities. The researchers discussed data saturation. When five respondents in a row failed to mention a new theme, we identified it as data saturation. The duration of the interviews was from 45 minutes to 85 minutes. Transcripts were shown to the students for corrections.

#### **Probing questions (Example)**

- Can you elaborate and tell us like a story how you learn?
- Do you have a fixed timetable?
- Do you make notes or underline?
- What do you do when you have a doubt?
- How do you mingle with your friends or do you make friends easily?
- How many times do you revise?
- Do you remember your learning material during sleep?
- What made you take this course up or have you joined by compulsion or passion?
- Do you read a single topic from one book or many books?
- Do you have two or alternate plans for studying?
- If I am making a model and give you all the materials, would you do it along with me (Active experimenter) or watch first and do next ( Reflective observation)
- If given a physiology project to make a working model of the heart in a group of 10, would you like to lead or participate? What role will you like to assume (Leadership qualities).
- Do you like to do other activities (listening to music) while learning? (Multi tasking).
- Are you confident in achieving your goal?
- Suppose there are two alternate answers to a question, would you read both?
- Do you like to read in the last minute before examinations?
- Do you like to analyse what you have learnt?
- Do you make concepts while learning?
- Do you like to correlate while you learn?
- When you go to a unknown place and don't know how to proceed, what would you do? (Divergers: will go ahead; convergers: will reach my destination somehow; assimilators: will wait, watch and search for some time and proceed; accommodators: will return and don't like to continue).

**At the end of the interview:** Students were explained about the Kolb's learning cycle with print outs and other possible tactics they can employ were discussed:

**E.g.:** Accommodators (The largest group in our study):

1. To make points and 'write' key words and important information while learning.
2. To improve on observations and analysis before making judgments.
3. To revise more than once before exam.
4. To maintain a timetable and not read in the last minute before examinations.
5. To try and use "Kinesthetic" method of learning using demonstrations, actions and role play.
6. How to make "concepts" while learning and to try the same.

**Sampling:** Continuous sampling was used for qualitative data collection and students from each of the learning cycle groups

## **Part 2: Data analysis:**

### *Quantitative Analysis:*

Data entry and analysis were performed with SPSS (Version 18.0., Chicago, United States of America). Mean and standard deviation were obtained for the Anatomy, Physiology and Biochemistry examination marks. Number of students and percentages were obtained for gender and learning styles. Chi-square test was conducted to compare the ranks and p-values reported. Independent t-test was conducted to compare the mean scores between gender and Analysis of Variance (ANOVA) was conducted to compare mean scores between the styles (Diverging, Assimilating, Converging and Accommodating). Test statistics, 95% Confidence Interval (CI) of the mean and p-values were reported.

### *Qualitative Analysis:*

**Data collection, Reporting:** During the interview, transcriptions generated and 22 pages of information 8765 words on quantitative data analysis. Descriptive categories were made from the contents of the transcripts which had characteristics of speech and writing and thus the unit of analysis was sentences and paragraphs. These are presented as axial hierarchical typology which represents conceptions of the phenomena of the students. Italics statements signify direct quotes of students. The pawing of the text material was done and codings were derived by both the interviewers. Themes and categories emerged during the - interviews and they were grouped together. Cards were made and placed on a table to live through the information. "Ocular scan" and "pile sorting" was employed. The first and second author performed the content analysis and the third author reviewed it. Disagreements were resolved through discussions. "Consolidated criteria for reporting qualitative research" (COREQ) guidelines were followed for reporting this study [21].

## **Statistical Analysis**

### *Quantitative Analysis:*

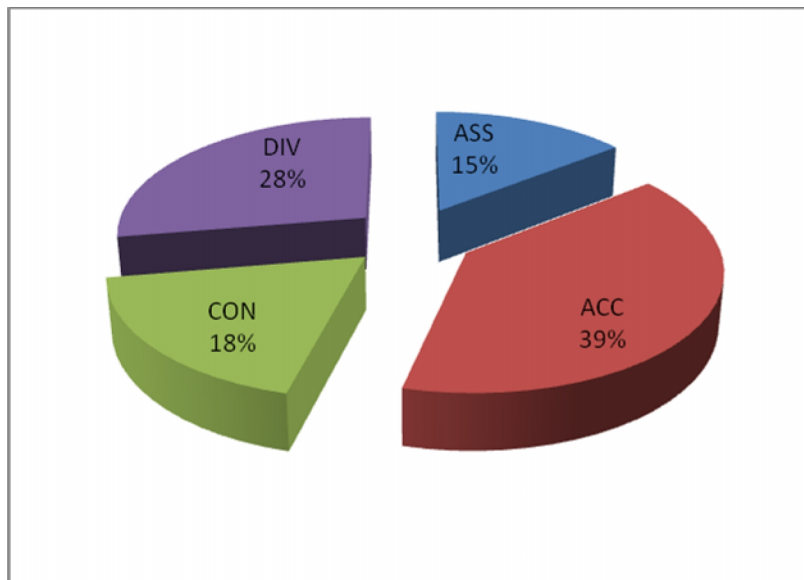
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#### *Qualitative Analysis:*

All the interviews were audio- recorded with permission of interviewees and Code for each interview as: Participant on May 24, 2011, Time: 2 pm. The recordings were transferred to computer and assigned interview code. The recordings were heard again as soon as possible notes were made. The key words, phrases, statements of participants were translated so that their thoughts and feelings could be understood. Notes were also written down during the interview [22,23].

### **3. RESULTS**



**Fig. 1. The percentage distribution of the 4 learners are represented**

#### *Quantitative Results:*

A total of 91 1st year MBBS students were approached and 88 students were enrolled and completed the study. Mean and standard deviation of the examination marks were presented in Table 1. Table 2 listed the number of students and percentages according to gender and learning styles. There were significantly more females and Accommodating style learners in this study population. The comparison of examination marks between male and female students showed no significant differences (Table 3). However, statistically significant differences were seen in the examination marks and learning styles (Table 3). Students grouped in Accommodating style had significantly lower marks in Anatomy and Biochemistry examinations compared to the other learning styles.

**Table 1. Gender Distribution of the four type of learners**

Divergers (24)		Convergers(18)		Assimilators(13)		Accommodators (33)	
Male	Female	Male	Female	Male	Female	Male	Female
5	19	9	9	2	11	13	20

**Table 2. Comparison of mean scores of 88 students according to style (total scores from anatomy, physiology and biochemistry tests) of 88 students according to learning style**

Learning Styles	N	Total scores Mean (SD)	95% CI of mean	Test Statistics (df)	p-value
Accommodating	33	*30.67 (6.48)	(28.37, 32.96)	7.116 (3)	<0.001
Diverging	24	36.96 (6.38)	(34.26, 39.65)		
Converging	18	37.39 (4.28)	(35.26, 39.52)		
Assimilating	13	36.15 (7.16)	(31.83, 40.48)		

\*Mean scores of Accommodator was statistically lower than Converging, Diverging and Assimilating styles, there is no statistical difference between mean scores of Converger, Divergering and Assimilator although these was a slight difference in the scores.

**Table 3. Students with accommodating style had significantly lower scores compared to other styles**

	N	Mean (SD)	95% CI of mean	Test Statistics (df)	p-value
<b>Anatomy</b>					
Diverging	24	10.58 (1.98)	(9.75, 11.42)	8.21 (3)	<0.001
Accommodating	33	<b>8.39</b> (2.03)	(7.67, 9.11)		
Converging	18	10.44 (1.34)	(9.78, 11.11)		
Assimilating	13	10.46 (2.30)	(9.07, 11.85)		
<b>Physiology</b>					
Diverging	24	14.21 (1.74)	(13.47, 14.94)	2.04 (3)	0.115
Accommodating	33	<b>13.30</b> (2.23)	(12.51, 14.09)		
Converging	18	14.50 (1.62)	(13.70, 15.30)		
Assimilating	13	14.38 (1.98)	(13.19, 15.58)		
<b>Biochemistry</b>					
Diverging	24	12.17 (3.10)	(10.86, 13.48)	8.49 (3)	<0.001
Accommodating	33	<b>8.97</b> (2.80)	(7.98, 9.96)		
Converging	18	12.44 (2.04)	(11.43, 13.46)		
Assimilating	13	11.31 (3.40)	(9.25, 13.36)		

*Qualitative Results:*

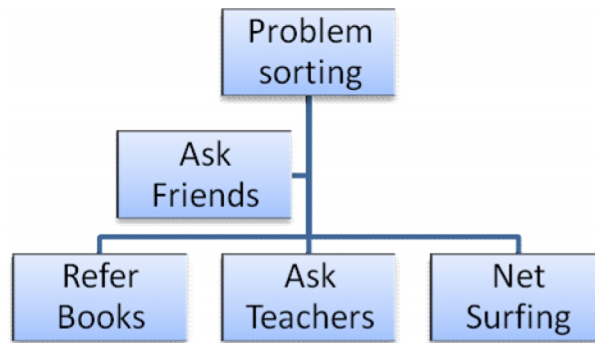
1. **Timetable**
  - **Preparing timetable**
    - **Following**
      - ✚ Length or duration --- short time table for days/weeks or long for the entire year
      - ✚ Keeping in mind
      - ✚ Writing a timetable
      - ✚ Making a plan A and plan B ( If A is not feasible)
      - ✚ Sticking the timetable on the wall and seeing it often
    - **Not Following**
  - **Not preparing timetable**
2. **References**
  - **Single source ( book)**
  - **Multiple source ( books)**
  - ✚ Regularly use many book
  - ✚ only in doubt some refer to other books
  - **Notes from lectures**
  - **Notes from seniors**
  - **Information from net**
3. **Reading**
  - **Single**
    - ✚ Reading aloud
    - ✚ Silent reading
  - **Group**
    - ✚ Active involvement
    - ✚ Passive listening
4. **Repeating and revising**
  - Regular and many times ( 4-6 times)
  - Just before examinations (once)
5. **Leadership qualities**
  - Likes to lead
  - Like to follow and participate

Fig. 2. Axial Coding and Hierarchical of Theme/ Category and Codes/ Labels



Fig. 3. Themes and Categories on learning pattern in University students





**Fig. 4. Figure represents the student's answers on how they deal with a doubt or problem in learning**

Reporting for this paper has been done following guidance of Stan Lester [24]. A summary of the findings has been arranged according to themes and topics and drawn out of key issues being discussed by participants. Discussion of intrusion of the researchers of interpretations, linkages and previous research has been made. Issues and implications are in final section of this paper.

The following pattern emerged:

**Divergers:**

They have regular study pattern. They usually study 3 to 4 hours per day with regular breaks in between. The breaks are for 10-15 minutes and they refresh themselves by music or walk or coffee during the break. They have a habit of making notes and underlining important points in the text. They use these for consolidating the memory. They make a timetable and follow it and they don't like to postpone their work. They stick memos on wall and see that often. They read more than one topic in a day and for the same topic use many references like notes, other text books, net search to gather more information. They like to discuss the study material with friends so that it remains in the mind for longer. They revise many times and take lesser time during subsequent revisions. They correlate the subject with examples from day to day life and previous experiences. They are good in fact gathering, likes to lead challenging projects. They have entered medical course with passion and not compulsion.

**OBSERVATION:** Response is immediate, spontaneous, accurate, good vocabulary while speaking. They looked confident, hard workers, high energy, competitive, self motivated, outspoken and enthusiastic. Have great interest and involvement in learning. They excel in curricular and extracurricular activities, they take initiative, exhibit leadership qualities.

**COMMENTS:** *"I like to teach others". "When the content is difficult, I teach myself"; "I have wide range of activities like painting, singing, cooking, karate, swimming, ballet dancing"; "Before sleeping I close my eyes and think of the material I have studied."; "I will volunteer to lead a group for a physiology project and would collect data from multiple sources to create a good model".*

### **Convergers:**

They are regular in study, their study duration ranges from 30 minutes to 3 hours per day with frequent breaks. They formulate a timetable, learn by making concepts, and make decisions from facts and not feelings. They like to read alone and silently, focus on tasks, underline in their textbooks, like to study deeply on a topic, like to derive reasons from self. They draw flow charts, read more than one topic in a day. They don't rely much on friends and cannot manage to accommodate others notes. They prefer to do things rather than merely watching. They enjoy hands –on practical sessions to theory classes. They do not like to procrastinate their work.

**OBSERVATION:** Focused, determined, pragmatic, goal-oriented, ambitious, expressive, presentation skills are good.

**COMMENTS:** *Somehow I will get what I want”, “I like to be alone” “I like to read the summary first and form a rough idea before going through the depth” ; “I don't believe what friends say and like to read the study material myself” “When we do, we remember “...said one student. “Dream about life and live for that dream” “I look at the tree so deeply that I forget the big picture and the forest” “I would love to lead a group in project work and make sure I finish before the time line”.*

### **Assimilators:**

They have flexible study plan. They do not like to write notes or underline. They formulate concepts, receive information from all available sources, read many books, they learn by observation and watching. They are silent readers, have been called lazy and they revise few times only. They need frequent breaks while studying, like to discuss with friends, read by correlating and like to multi task their activities.

**OBSERVATION:** Flexible and easy going, Adapting to the surroundings, more oriented by quality than quantity, speak slowly and steadily, Balanced, Cautious, good in interpretation, and application of knowledge, good analyzers

**COMMENTS:** *“I like to watch and reflect before I make a judgment” “I need to be convinced first before I take up a task”, “I avoid leading a project group and would do so only if I have no choice”*

### **Accommodators:**

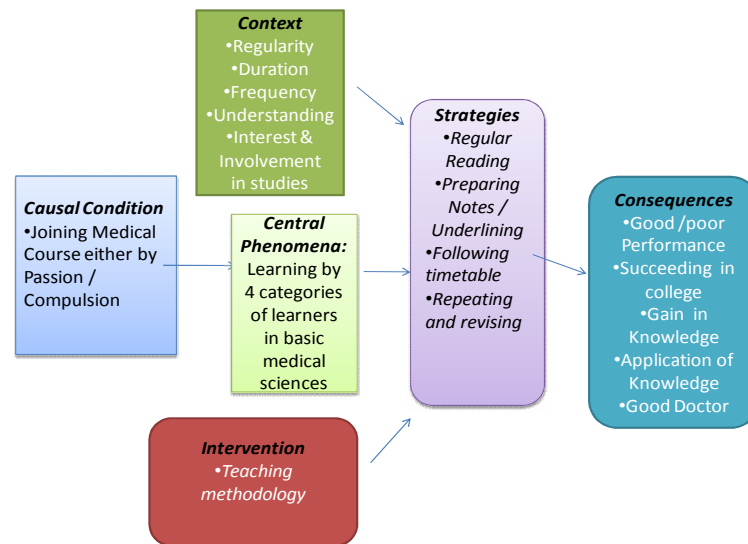
No regular pattern in studying, don't believe in writing notes, not interested in preparing self notes but can manage to study and accommodate with others notes, underline sometimes if they like the topic or subject, opinions given by friends and faculty will be taken easily without analyzing (when he/she approaches a friend for clearing doubts), they read single topic per time, don't like multi tasking, they read randomly, They don't cover all topics in the text book or lectures (coverage), They adapt well to situation: Eg: Many expressed that they prefer to read alone for anatomy and prefer to read in groups with friends for biochemistry and physiology, They have energy to read more in the beginning which slackens after some time, they like practical better than theory, takes things casually, use mnemonic and flow charts to study, Unable to concentrate while learning, unclear with aim, often procrastination of work, mingling with group easily. They have selected this course due to suggestion or advice from family or friends.

**COMMENT:** “When someone teaches me or tells me the matter, I can catch up easily. If I read on my own, I take double the time”; “You don’t forget stuff if you discuss in a group”; “Examinations are a crap and I need to get over it in the easiest way”; “I don’t like to lead a group and will try to escape the situation”.

**OBSERVATION:** Response is vague. Need many prompts. Need many probing questions to share their opinion. Friendly disposition. Casual attitude. Restless in nature. Forgetful (it was observed during the interviews that accommodators forgot note books, pen, umbrella and bags in the interview room many times).

**Table 4. Additions interpretations made on the 4 types of learners are depicted in the table below (Poor+, Fair++, Average+++, Good++++, Excellent+++++)**

Mind set group factor	Diverger	Converger	Assimilator	Accommodator
	Focused Likes groups	Focused Alone	Focused Alone	Flexible Groups of friends
Mingling with friends	+++	+	++	++++
Interest factor	+++	+++	++	++
Conceptualization	++	+++	+++	+
Performance in tasks	+++++	++++	+++	++
Confidence factor	+++++	+++++	+++++	+++
Enthusiasm Initial	+++++	+++++	+++++	+++++
to learn new things Maintenance	+++++	+++++	+++++	++
Analyzing	+++	+++	+++++	++
Attitude to learning	Formal and systematic	Structured	Relaxed	Casual , untailed and like spoon feeding



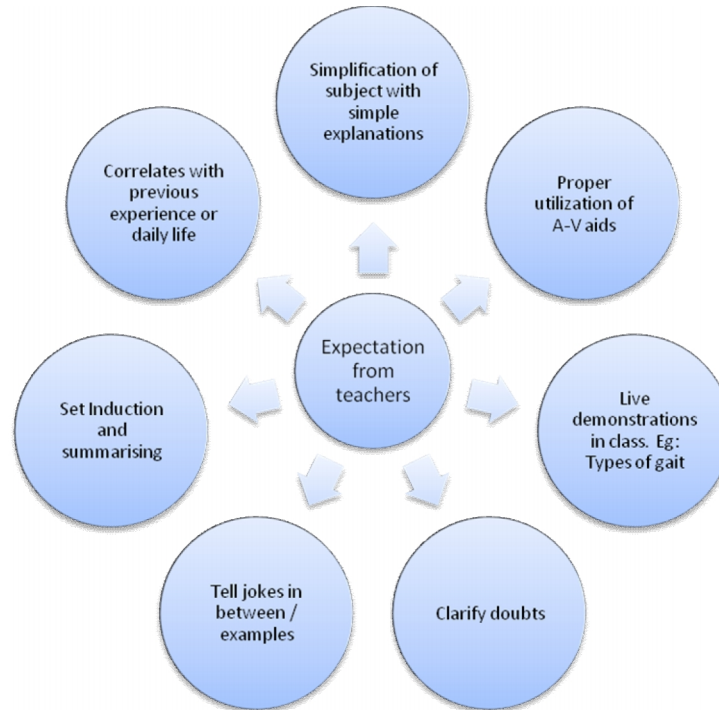
**Fig. 5. Theoretical model created for learning for the 4 types of learners**

Students' preference to teaching and teachers which helped them in their learning.

**Question: How do you like your teacher to teach so that you remember well? Or which method did they adopt in the class room teaching which you enjoyed most?**

The coding of the above data on study pattern of students was **inclusive**, while the coding which was employed for the data on preferred teaching methods was **exhaustive**. The divergers, convergers, assimilators and accommodators gave common phenomena for preferred teaching methods employed by faculty.

Our central phenomena which revolved around the four categories of learners (diverger, converger, assimilator and accommodator) and the strategies they have employed to make learning successful. The cause or condition of joining medical course was broadly divided into entry into medical course by compulsion or by passion. During the interviews, the context emerged that each of the four categories differed in terms of regularity, duration, frequency, interest and involvement of the student in learning. Thus, the dissimilar strategies, which emerged in each category of learner, was coded and pile sorted separately. The teaching methods were considered as intervention as students expressed that teaching influenced their study patterns either by creating an interest in a subject or by simplifying the difficult chapters. The ultimate consequence would be the successful performance in examination and application of knowledge in practice to serve the community as a good doctor.



**Fig. 6. Exhaustive coding of raw data on preferred teaching methods revealed the following**

#### 4. DISCUSSION

The research intention was to understand the experiences of student learners who employ different learning styles and therefore the focus was on the participant's personal viewpoints, perceptions and responses to questions.

The converger, divergers and assimilator employed techniques in a systematic method to triumph over the accommodators. The strategies employed by them were painstaking, thorough and meticulous. Hard work, durable, detailed and comprehensive planning of the learning material has contributed to their success. The top academic achiever was a diverger. While many of the divergers have scored well, the accommodators had both good and poor scoring students. The second rank holder was an accommodator. The methods employed by the successful students were writing points, key words or notes and underlining. Reading and writing enhances memory. Reports are available that read-write and kinesthetic learners have more academic success [25]. Theorist and academic success: Woolhouse and Blaire [27] have reported that there seems to be a relation between theorist (Convergers and assimilators) and academic success.

**According to Edgar Dale's Cone of Experience, We remember: 10% of what we read, 20% of what we hear, 30% of what we see, 50% of what we see and hear, 70% of what we discuss with others, 80% of what we personally experience and 90% of what we teach others.**

**Sleep learner:** It was interesting to note that three students (two divergers and one converger) have mentioned their ability to study in their sleep. The learning material is thought over carefully before sleep and they revise in their dream. Their family and friends have caught them saying these study material in sleep. There is evidence that we learn while we sleep. Experiments have associated intense periods of daytime learning with longer periods of sleep that night, and particularly with dreaming. People awakened repeatedly from their dreams don't retain much of what they learned the day before [28]. "Sleep is actively engaged in the cognitive processing of our memories," "Knowledge appears to expand both over time and with sleep." "Sleeping on it," instead of cramming during an all-nighter, should help not just students preparing for a final exam but everyone dealing with near-overloads of critical information. That brings up the possibility of training yourself to be a sleep learner [29]. Previous research on sleep learning has found that learning improves as a result of sleep. Evidence supports a role for sleep in the consolidation of an array of learning and memory tasks [30].

Balanced learning profile and academic success: It was interesting to note that the academically successful students used all four stages of Kolb's learning cycle: Concrete Experience - (CE), Reflective Observation-(RO), Abstract Conceptualization - (AC), Active Experimentation - (AE) (Table 5). These students have scored of 4 and 5 out of a total of 9. This means they are using all the styles in a balanced manner and are easily able to adapt to learning based on the circumstances and requirement [31].

**Table 5. Scores of balanced learners**

Learner/ score	Balanced Learners (N=9)	Other Learners
Scores (AE, RO) and (CE, AC)	4,5 or 5,4	1,8 ; 2,7; 3,6 and vice versa
Formative assessment marks (Mean+- SD)	37.11 ± 6.88	34.27± 6.77

Thus, the effectiveness of learning relies on the ability to balance these modes. Balanced profiles are manifestations of integrated learning in the sense that people with these styles learn in a holistic way, utilizing effectively the abilities associated with all four learning modes. People with balanced learning profiles in both dimensions are more sophisticated (adaptively flexible) learners [32]. A student may never abandon her dominant learning style, but can show improvement in a variety of learning environments. This is referred to as "bridging the gap" to make the student more capable of succeeding via various teaching methods [33].

**Indigenous categories which emerged:** Accommodators: "Mind is saturated soon" "teacher is cool", "Good night class" for boring lectures' "flunk in the exam due to poor formative assessment marks", "bunk the class often" (In India, these words are not used often)".

**Metaphors and analogies which emerged in this study:**

**Diverger:** "If the tree has deep roots , only then it can give good fruits for a longer time" (The divergers adopt deep approach learning which involves the critical analysis of new ideas, linking them to already known concepts and principles, leads to understanding, focus is on "what is signified" with internal emphasis).

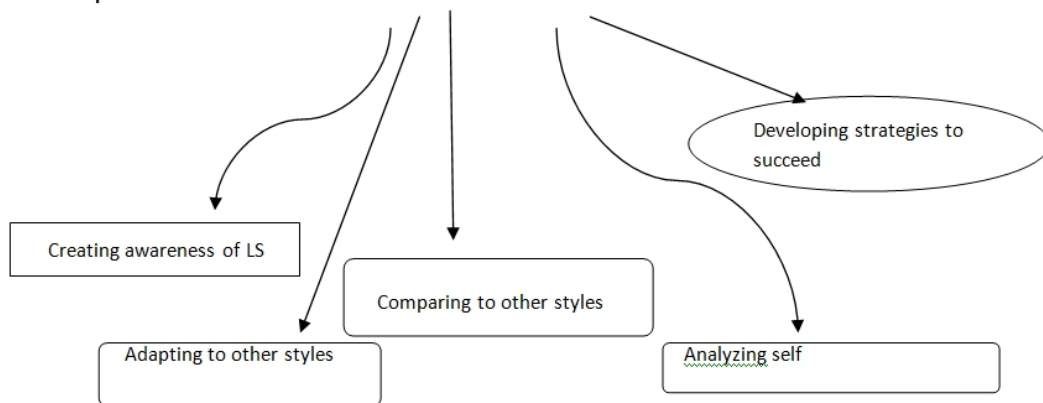
**Accommodator:** "The fruit which is seen outside is sufficient and not the roots" (The fruit signifies the easily attainable information on the outside, while root is linked to the deep understanding and basics of the subject. In superficial approach adopted by the accommodator the focus is on "signs" with external emphasis).

**Conclusion:** This study proves that study strategies adopted were responsible largely for achieving academic success, whereas the learning styles were merely used as a tool to unravel the central theme. The faculty can encourage the students (accommodators) to following the successful strategies employed by the other learners.

"No man is born intelligent, but become one by assiduous, conscientious and diligent planning, programming and execution".

**Follow up:** Students gave written and oral feedback that they enjoyed the interviews. They were happy and excited to know their styles. This helped them to develop their style better. They now know what other styles they can adapt to and could assess the different learners. This was useful for examinations and they could understand the draw back and deficiencies in their learning pattern.

Interviews helped in



**Fig. 7. Students' perception on usefulness of the interviews**

**Future Directions:** 1) Since the four different style of learners use different strategies, we would like to explore the possibility that students have different perceptions on preferred assessment methods (Outcome based assessment and learning styles). 2) To follow up the students at the end of second year and investigate the possible change in learning styles after entering clinical years. 3) To look into teaching style of faculty and probe into whether it affected by their respective learning styles. 4) To check stress level using questionnaire in divergers, convergers, assimilators, accommodators.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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