

## ORIGINAL ARTICLE

# Learning Styles of Final Year MBBS Students Taught Through Problem Based Learning Strategy Over a Period of Five Years

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## ABSTRACT

**Objective:** To identify the influence of problem based learning strategy on the learning styles of final year medical students who have been taught through the student centered teaching curriculum over a period of 5 years.

**Study Design:** A descriptive study.

**Place and Duration of Study:** The study was conducted at Islamic International Medical College in April 2013.

**Materials and Methods:** Learning styles of students of final year medical students of Riphah International University taught in an integrated student centered curriculum over 5 years of medical school were identified by using the Learning Style Orientation Inventory.

**Results:** A total of 90 students were recruited in the study, out of which 40 % were males and 60% were females. 51.1% were observational learners, 15.55% were experiential learners, 11.1% were structured learners. The least number of students were discovery (4.44%) and group learners (3.33%).

**Conclusion:** Our study shows inclination towards group learning in only 8.8% students (both preference and mixed methods) all of which were females. Maximum students still preferred to be observational learners who are passive dependent superficial learners and not open to new experiences and analytical thinking. These findings suggest that further research to look for factors that can inculcate deeper learning habits in the students is needed.

**Key Words:** *Learning styles, Student centered learning, Problem based learning, Final year medical students.*

## Introduction

The challenges faced by doctors in this modern era of medical practice have become diverse. Researchers in medical education are becoming increasingly aware of the use of variety of teaching methods that may ultimately improve the retention of ever increasing knowledge along with development of problem solving skills and adaptability to new situations.<sup>1,2,3</sup> Teaching methodologies are designed to increase retention of knowledge, enhance integration and application of concepts to the clinical contexts. To achieve expertise in clinical skills, a medical student is required to develop problem solving skills, intrinsic drive to analyze and apply knowledge and develop self directed learning habits.<sup>4</sup> Such high order cognition requires students to use a diverse array of learning styles and strategies chosen to suit a certain learning situation. Problem based learning has been implemented differently in different medical curricula as adjunct or alternative to traditional didactic teaching.<sup>5,6,7</sup> Problem Based learning was first introduced at McMaster University in 1960, using problems or case as stimulants for

students to find solutions.<sup>8,9</sup> Learning is student centered occurring in small groups of 8-10, led by a facilitator. The focus of learning is a problem selected to enhance the curricula and becomes a means to stimulate a learning process. The group meets twice weekly. They attempt to find explanation to phenomena, events or cases, correlating them in the given problem and building up on their previous knowledge. Students generate questions and find answers on their own. The solution may be single or multiple and students are given the opportunity to use all possible sources of information. This teaching approach helps students to develop motivation for self directed learning, collaboration, communication, problem solving and critical thinking skills<sup>10,11,12</sup> which are important for the training of medical students appropriate to meet the demands of modern medical practice.<sup>13</sup> Riphah International University has recently adopted a student centered curriculum in the medical school. They have introduced problem based learning, small group discussions and case based learning as an adjunct to the traditional didactic system of lecturing. This study aims to identify the influence of student centered curriculum with use of problem based learning strategy on individual learning preferences of final year medical students at the end of a 5 year teaching program. There are a number of

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varieties of theories and models for measuring learning styles of students. Cassidy has mentioned that it is difficult to choose any specific instrument for evaluation of student's learning styles.<sup>9</sup> We have selected the Learning Style Orientation Inventory (LSOI) designed by Annette J. Towler and Robert L. Dipboye.<sup>14</sup> This instrument defines five different learning styles namely discovery, group learning, experiential learning, structured and observational learning styles. The survey was conducted by using the "Learning Style Orientation Measure". It allows identification of learning preferences in relation to their teaching environment. It consists of a 54 item questionnaire. 14 items are assigned to discovery style, 7 items to group learning, 13 items to experiential learning, 11 items to structured learning and 9 items to observational learning.

- **Discovery learners** enjoy a broad range of learning situations like interactional lectures and active reflective activities promoting abstract thought and deal with complex issues.
- **Group learners** enjoy group activities with others enhancing group dynamics and collaborative learning, stimulating group activities with one on one discussion. Each individual takes his own responsibility to learn for the group to work effectively. It is one of the methods of collaborative in depth learning with teaching and learning going on simultaneously among the students.
- **Experiential learners** enjoy taking initiative and like to experience practically. They enjoy learning in role plays and simulations and do not feel comfortable with passive learning.
- **Structured learners** rely on their own information processing strategies for effective learning to occur. They prefer to impose their own structure of learning in situations.
- **Observational learners** are passive learners dependent upon external cues to help them learn. They require concrete direct experiences which are provided and planned by the authorities in the form of didactic lectures, field trips, video films etc. They do not enjoy activities requiring active learning strategies for analytical and logical critical thinking. They are not open to new experiences and do not do well in learning

situations that are autonomic and student centered. They are more likely to be dependent superficial learners.

### Materials and Methods

The undergraduate program of Riphah International University is a 5 years Bachelor in Medicine and Surgery. It is implementing an integrated modular system incorporating student centered learning strategies like problem based learning and small group discussions along with traditional didactic teaching. This batch had studied through the modular system in which each module incorporated at least 2 to 3 PBL sessions making a total of 8 to 10 PBL each year over a four year modular teaching program. Final year comprised of clerkships in various clinical specialties. This study is a cross sectional survey inducting final year medical students through non-probability convenience sampling who have been taught through the student centered medical curriculum. The information was collected by inducting the final year MBBS students after consent who filled the LSOI proforma. The data was collected, scored, analyzed and interpreted by the researchers. The survey was conducted by using the "Learning Style Orientation Measure". It allows identification of learning preferences in relation to their teaching environment. It consists of a 54 item questionnaire. 14 items are assigned to discovery style, 7 items to group learning, 13 items to experiential learning, 11 items to structured learning and 9 items to observational learning.

### Results

Out of 90 students, 36 (40%) were males and 54 (60%) were females. Maximum number of students were found to be observational learners making a total of 46 (51.1%). These were followed by 14 (15.55%) experiential learners and 10 (11.1%) were structured learners. Group and discovery learners were least in number with 3 (3.33%) and 4 (4.44%) each in these groups (Table I). Among the male students 17 (47.22%) were observational learners and 9 (25%) were experiential learners (Table II). Females showed the same pattern with 29 (53.7%) being observational learners and 17 (30.9%) experiential learners. In contrast to male students who had no preference for group learning, only 3 (5.5%) preferred group learning. 2 (3.7%) were

discovery learners and 5(9.25%) were structured and experiential learners each among females. (Table III) Mixed modality learning was identified in 3 (8.3%) males and 10(18.5%) females.

**Table I: Learning styles of all final year students (n= 90)**

Learning styles	No (90)	Percentage
Discovery	4	4.44%
Group	3	3.33%
Experiential	14	15.55%
Structured	10	11.11%
Observational	46	51.1%
Mixed methods	13	14.44%
Total	90	100%

**Table II: Learning style distribution of male students (n= 36)**

Learning styles	No (36)	Percentage
Discovery	2	5.55%
Group	0	0%
Experiential	9	25%
Structured	5	13.88%
Observational	17	47.22%
Mixed methods	3	8.33%
Total	36	100%

**Table III: Learning style distribution of female students (n= 54)**

Learning styles	No (54)	Percentage
Discovery	2	3.70%
Group	3	5.55%
Experiential	5	9.25%
Structured	5	9.25%
Observational	29	53.70%
Mixed method	10	18.51%
Total	54	100%

## Discussion

Problem based learning has turned out to be a widely used educational approach in the last decade. It has been incorporated with the belief that it adds to key attributes to the training of doctors who need to be equipped to meet the demands of modern medical practice. According to Barrows and Tamblyn and

Dolmans and Schmidt, problem based learning enhances the retention, integration and application of knowledge of basic sciences to the clinical sciences along with development of essential skills for problem solving, developing independent study habits and self directed learning, enhancing intrinsic interest in the subject.<sup>4,10</sup> PBL graduates develop a more patient centered approach with better interpersonal skills required for a good doctor-patient relations developing a more humanistic and holistic attitude to medical practice.<sup>15</sup> The results of our study show a predominance of observational learners (51.1%) among the students. The more striking aspect is such a low percentage of group learners i.e., 5.55% as single preference and 9.25% with mixed preference. All group learners were females.

Problem based learning has time and again been associated with improved in depth learning with development of conceptual understanding, problem solving, critical thinking and self directed learning.<sup>16,17,18</sup> However, our results show a predominance of observational surface learners after studying in a student centered environment. Groves has documented similar results in her study where she has reported a change from deep learning towards a more surface approach over her study period with significant decreases in learning scores.<sup>13</sup> Novak et al has also noted an increase in avoidant behavior and decrease in active participation among groups in pharmacy students after going through a PBL curriculum.<sup>19</sup> "Stress" has been implicated as an important factor that can result in failure of PBL teaching methods.<sup>20</sup> Discomfort between students and facilitators may also be one factor as not only students but facilitators also have to adjust their teaching styles to the new teaching modalities.<sup>19</sup> Furthermore, factors like new teaching environment, excessive work load and a robust subject matter in medicine can also be important determinants for success of student centered small group learning.<sup>14,21</sup> Medical curricula are content heavy with a lot of pressure to acquire large amount of knowledge. This may trigger the shift towards more superficial learning styles against a more conceptual and time consuming approach.<sup>13</sup> One more aspect that needs to be explored in this context is the type of assessment used to assess conceptual

understanding and critical thinking. It is believed that assessment drives learning. If the assessment is not

