

## COMPARATIVE STUDY OF TWO TYPES OF ASSESSMENT IN SELF DIRECTED LEARNING APPROACH IN PHARMACOLOGY

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### Summary

Different medical schools follow different methods of teaching in their curriculum to teach students apart from didactic lecture. The common approaches are small group teaching, problem based learning, and case based learning and self directed learning (SDL). The learning can be evaluated by written assignments, discussion or multiple true false tests (MTF), which are associated with nonparticipation, lack of motivation and coverage of topic. In the present study, we made an attempt to analyze two types of SDL assessments i.e. MTF test and vignette oriented single best response type (VOT) of test. This study was conducted on pharmacology students of Melaka Manipal Medical College, for a batch of 131 students. In the first setting, routine MTF test was conducted followed by vignette oriented single best response test on gastrointestinal pharmacology. The subjective evaluation of test was done through the feedback obtained from students on either occasion and objective assessment was done by comparing their marks in two types of test. Majority of students (84.7%) opined that MTF pattern of test was easy as opposed to 15.3% in VOT. Significant percentage of students felt the VOT type of assessment motivates much and need thorough preparation. The results of subjective assessment was concurrent with objective assessment, which showed a significantly less scoring in VOT i.e  $15.8 \pm 0.52$  against  $21.87 \pm 0.34$  in MTF .statistically ( $P < 0.0001$ ). We conclude that VOT assessment can facilitate learning, by motivating the students to prepare thoroughly so that students depth of knowledge could be enhanced. This method of assessment can be a useful method in assessing the students in SDL.

**Key words:** self directed learning, assessment tools, learning approach

**Short title** – Assessment methods in self directed learning

## **Introduction**

Self-directed learning (SDL) is an essential skill for medical students. Self-directed learning is most essential to fulfill the requirements of the present health care system. SDLs are the integral part of the curriculum in many medical colleges. In this approach, learners take the initiative in making use of resources. Students are given certain topics and sufficient time to study on their own; they need to take the initiative and a greater responsibility in understanding the facts. The instructor has to just assist them in acquiring the knowledge. Learning in this approach can be assessed by different types of evaluations such as discussions, written assignments or multiple true false tests (MTF) or multiple choice questions (MCQ) etc. Evaluation of the students by various assessment methods reflects their depth of knowledge on the given exercise, skills obtained, professionalism, interest in learning etc. Different assessment methods can be used to assess the depth of knowledge at different levels. [1-4]

The use of multiple formats provides greater variety in the areas of content that are evaluated and inputs from multiple assessment methods provides information on distinct aspects of student's performance. We have noticed that student's participation is poor and lack motivation in the SDL when we employed discussions, written assignments and MTF test possibly due to excessive didactic lecture sessions that can demotivate students and also time constraints. Our objective of this study is to analyze the merits and demerits of by SDL assessments methods i.e. MTF tests and vignette oriented single best response type (VOT) questions and if well appreciated by the students, we can introduce the new method of SDL assessment in future.

## **Materials and Method**

We conducted the study on a batch of 131 medical undergraduates in phase 2 studying in Melaka Manipal Medical College. SDL was a part of pharmacology curriculum. Gastrointestinal system topics (Drugs used in diarrhoea, constipation, inflammatory bowel disease and irritable bowel syndrome) were given as SDL topics on different settings. The students were briefed about the new method of assessment in advance. In the first half, MTF test consisting of 30 questions was conducted and followed by VOT type of assessment. The students' feedback regarding both the assessments were obtained after the end of VOT. The objective assessment was done by taking the average score in two different types.

We also analysed the scoring pattern of students i.e. students with scores >75%, 60-75%, 50-59%, 40-49% and <40% to know how the students have performed in the two methods of assessments in SDL.

Questionnaire: - The protocol of the study was discussed with the medical educationist of our institute. We obtained the feedback through structured closed ended questionnaire which is validated by peer group of medical educationists. The test –retest reliability was obtained by giving the questionnaire to group of students (20) on two different occasions with the interval of six weeks. The Cronbach’s  $\alpha$  error was 0.65.

### Statistical analysis

Paired ‘T’ test was used to compare the mean scores and different percentage in subjective and objective assessment and  $P < 0.05$  was considered statistically significant.

### Results

Majority of the students (84.73 %) felt that MTF was an **easy** assessment method. The subjective assessment showed that 63.36% of the students felt, VOT type of assessment is better as it motivates learning compared to 36.64% which was statistically significant( $P=0.002$ ). Most of our students (80.16%) were of the opinion that VOT test requires thorough preparation compared to 19.84 %( $P < 0.001$ ) (Table 1).

Table 1: Showing the subjective feedback from students regarding the mode of assessment

Feedback	Group I(SDL)	Group II(VOT)
Easy	111 (84.73%)	20(15.27%)*
Motivates the student	48 (36.64%)	83(63.36) **
Thorough preparation is required	26 (19.84%)	105(80.16%) *
Tests the depth of knowledge	54 (41.22%)	77(58.88%)

\* $P < 0.0001$ , with same parameter group I, Fisher’s two tailed test

\*\* $P=0.002$  with same parameter group I, Fisher’s two tailed test

There was mixed opinion regarding the assessment of depth of knowledge in these two types of assessment i.e 41.12 % in MTF test v/s 58.88 in VOT which was statistically not significant. It was clearly evident from the scoring pattern of students in two types of assessment that the VOT is tough nut to crack. Significant number of students i.e. 39.69% in VOT had scored less than 50% as against 5.44% in MTF test ( $p < 0.0015$ ). Similar to their subjective opinion, the MTF test was relatively easy and most of students have scored  $>75$  % and 60-74% in MTF against the VOT ( $p < 0.0001$ ) (Table 2)

Table 2: The pattern of scoring in two different types of SDL tests.

Scores in Percentage	Group I(131)	Group II(131)
$>75$	64( 49.61% )	28(21.37% ) *
60-74	50( 38.16% )	18( 13.74% ) *
50-59	10( 7.63% )	33( 25.19% ) **
$<50\%$	7( 5.44 )	52( 39.69% ) ***

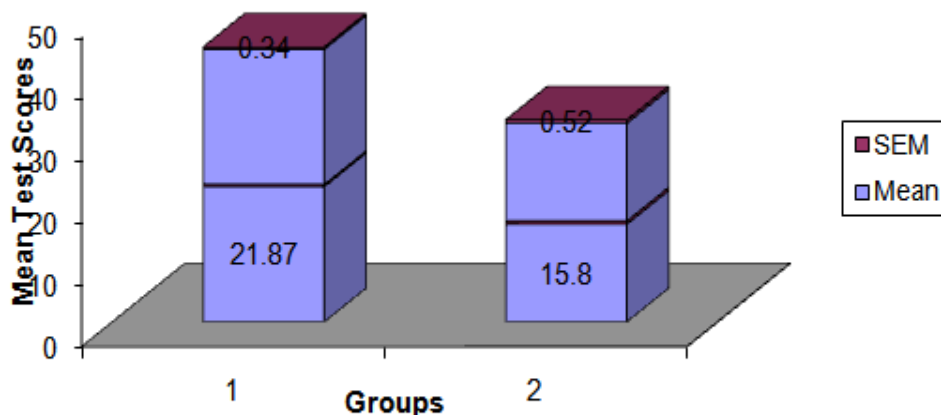
\* $P < 0.0001$  with same parameter in group I, Fisher's two tailed test

\*\*  $P < 0.0002$  with same parameter in group I, Fisher's two tailed test

\*\*\* $P < 0.0015$  with same parameter in group I, Fisher's two tailed test

Based on the objective assessment, we could find that average score of students was comparatively high ( $21.87 \pm 0.34$ ) in MTF test than the VOT test ( $15.8 \pm 0.52$ ). There was a statistically significant difference in the scoring pattern in the two test ( $P < 0.0001$ ) (Figure 1). This was in accordance with their subjective assessment that VOT is a difficult assessment method and requiring thorough preparation.

**Figure 1 showing test score of different methods of assessment**



Group 1- MTF test, Group 2 – VOT,  $P < 0.0001$ , extremely significant

### Discussion

SDL is one of the accessories teaching method and used sparingly in a proper way in medical schools. Employing different method of assessment makes this more meaningful as we can judge the most appropriate type of assessment. This gives a new dimension to the learning methods. Assessments help students to identify and respond to their own learning needs. The assessment of competence provides insight into actual performance as well as the ability to adapt to change, generate new knowledge, and overall performance. [5] A well designed assessment program will use different types of question appropriate for the content being tested. Using only one type of question throughout the whole curriculum is not a valid approach. So we adopted both multiple true false test and vignette oriented test.

Each assessment method has its own advantages and disadvantages. The advantages with MTF test was that, it enabled us to ask a question with more than one correct answer, concise, answered quickly by the student. Difficulties with this method were framing of questions, difficult to

construct flawlessly and the statements have to be defensibly true or absolutely false. It is not an easy task. When a student answers a “false” question correctly, we can conclude only that the student knew the statement was false, not that he or she knew the correct fact. True or false questions are most suitable when the purpose of the question is to test whether students are able to evaluate the correctness of an assumption; in other cases they are best avoided. <sup>[6]</sup>

VOT is universally accepted testing system, needs application of facts in clinical scenario. It can differentiate adequately among students with different levels of knowledge and ability. A clinical vignette is a concise presentation of a challenging patient encounter. The aim is to highlight the unique aspect of the patient interaction that stimulated an interesting learning issue. The challenge may be in the diagnosis, management, understanding of underlying pathophysiology, or personal interaction with the patient. <sup>[7]</sup> The students need to know not only about the drug and its pharmacological aspect but also about its applications in clinical scenario. So this type of assessment not only tests their knowledge but their judgment, competency, their approach towards a patient etc. In the present study, students’ opinion was mixed. Even though they scored significantly less in VOT type, most of the students felt that it is a better method of assessing the knowledge and learning. Students also felt that VOT requires thorough preparation and motivates students ( $p < 0.01$ ).

It is generally acknowledged that assessment drives learning; however, assessment can have both intended and unintended consequences [2]. Students study more thoughtfully when they anticipate certain examination formats and changes in the format can shift their focus to clinical rather than theoretical issues. <sup>[8, 9]</sup> If we make VOT as one of the assessment tools, automatically students approach for the subject and their focus will change. Assessment by peers seems to promote professionalism, teamwork, and communication. <sup>[10]</sup> As deep learning and strategic approach are recommended in learning it is better to use the assessment method that stimulates them.

### **Conclusion**

The VOT type could be a good exercise in learning, covering the subject in depth. It can stimulate the students to understand the subject in depth and also it motivates them to prepare thoroughly. It makes the medical students to realize the importance of self learning in medical profession.

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