

Original Article

Preparedness of Phase 1 MBBS Students for Self-directed Learning Process

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Self-directed learning is important for MBBS students to prepare themselves as lifelong learner. But a “spoon-fed” school student needs to be sufficiently prepared to learn by SDL. In this study, the ability of the students to learn by SDL is measured along with evaluation of the reliability of as “Self-Directed Learning Instrument” (SDLI) as measuring tool. All willing students of the 1st phase MBBS curriculum (Batch 2020-21) were given a 20-item questionnaire known as “Self-directed Learning Instrument” (SDLI) to evaluate their learning abilities by SDL. A higher level of SDL is indicated by a higher score. A total of 247 students were included in the study. The result shows that students have poorest ability in Planning and Implementation domain (Mean: 3.9, variance: 0.26) whereas they are strongly motivated (Mean:4.3, variance: 0.37). SDLI score revealed that only 6 students need special care from faculties. Some (n = 81) needed observation and monitoring whereas majority of students (160, 64.8%) were supposed to be able to learn of their own. The method was found to be reliable as Cronbach’s alpha for all domains were over 0.70. The students with poor ability to learn by themselves can be identified in the very beginning of the session who can be given special attention and facilitated to grow as lifelong learner.

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Key words : Self-directed Learning (SDL), Self-directed Learning Instrument (SDLI), Domain wise assessment.

The introduction of Competency-based Medical Education (CBME) Curriculum in India has endorsed many new concepts, one of which is Self-Directed Learning (SDL). In SDL the students are expected to take the initiative to diagnose their learning needs, formulate their learning goals, identify resources for learning and evaluate their learning outcomes¹. Thus, SDL is primarily a higher order active learning technique where onus of learning lies with the students. Dedicated time has been allotted to SDL in CBME curriculum in each specialty. As SDL is a newly introduced method of learning, the implementation of SDL is facing some challenges. One of such problem is that medical students in Phase 1 of their MBBS curriculum are in the transition phase from their school life. They depend too much on teachers and expect some sort of “spoon feeding.” A study by Sari D, *et al*² had reported that students are very much dependant on teachers. So, without active involvement of faculties, students can rarely develop the skills of becoming self-directed learner. Hence it is very much important to understand their preparedness to study by SDL.

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Editor's Comment :

- To implement self-directed learning successfully, the preparedness of MBBS students should be initially assessed by SDLI. The limitation of individual students, if identified and taken care of, then only they will be able to carry out their role as “Life long learner,” as mentioned in CBME.

Garrison developed a model³, where self-motivation, self-monitoring and self-management were demonstrated as components of SDL. In addition to these components, communication is an important learning process for the medical profession, which is also related to Self-directed learning process. The inner drive and external stimuli motivating a learner to learn and to take responsibility for own learning is known as learning motivation. The ability of setting learning objectives independently is called planning, Achievement of learning goals using appropriate learning strategies and resources is called implementation. The ability to evaluate one’s learning process and outcome is self-monitoring. When learners interact with each other to promote their own learning, that is known as Interpersonal communication.

The measurement of ability of the students to learn by SDL is a challenge. Cadorn, *et al*⁴ compared several tools for the same and recommended superiority of “Self-Directed Learning Instrument” (SDLI) to evaluate SDL abilities⁴. SDLI was developed by Shen, *et al*⁵ for mainland Chinese Nursing students. No such tool for

medical students is still available. So, the reliability of this tool in a Medical College set up needed to be established.

In this background, this study is conducted to assess the ability of the students to learn by SDL in a Government Medical College of West Bengal. The specific objective of the study is to find out whether the Phase 1 MBBS students are prepared to learn Biochemistry by self-directed learning activity. The reliability of measuring tool (SDLI) was also evaluated in the current study setting.

MATERIALS AND METHODS

This cross-sectional study was conducted in a Government Medical College of West Bengal in December, 2021. All students of the 1st phase MBBS curriculum were asked to bring their own smartphone/laptop with internet connection during one fixed date of Biochemistry class of one hour. They were introduced briefly to the objectives and the methodological workflow of the study by an interactive lecture. All willing students were included in the study. Those students, who were absent on that day were excluded for the study.

Then they were given a questionnaire prepared in google form. The first part consisted of questionnaire on personal data. In the next part, they were given 20 items of SDLI. The participants were asked to select their response from a Likert scale of 5-point rating: "strongly disagree," "disagree," "neutral," "agree," and "strongly agree." Estimated time to respond to the entire questionnaire was approximately 30 minutes. Research has been proved that Computer based methods are better than paper-based questions. It solves the problem of incomplete data or missing data by making the answer field mandatory. Retrieval of data in excel form is automatic and thus statistical analysis becomes easy. Electronic versions of questionnaires have shown consistent test-retest reliability of data. Due to all these reasons, though students were present physically, electronic version was used to gather survey data.

"Self-directed Learning Instrument (SDLI) is a validated tool composed of 20 items questionnaire, containing four domains. First domain is "learning motivation." which is defined as the inner drive of the learner as well as external stimuli motivating one to learn and to take responsibility for one's learning (first 6 questions state, I know what I need to learn; Regardless of the results or effectiveness of my learning, I still like learning; I strongly hope to constantly improve and excel in my learning; My successes and failures inspire me to continue learning;

I enjoy finding answers to questions; I will not give up learning because I face some difficulties).

The next domain is "Planning and implementing" (Question No. 7-12 stating I can proactively establish my learning goals; I know what learning strategies are appropriate for me in reaching my learning goals; I set the priorities of my learning; Whether in the clinical practicum, classroom or on my own, I am able to follow my own plan of learning; I am good at arranging and controlling my learning time; I know how to find resources for my learning). "Planning and implementing" is defined as the ability to independently set learning objectives, using appropriate learning strategies and resources in order to effectively achieve learning goals.

Third domain "self-monitoring," is defined as the ability to evaluate one's learning process and outcomes. It consists of Question No. 13-16, stating I can connect new knowledge with my own personal experiences; I understand the strengths and weakness of my learning; I can monitor my learning progress; I can evaluate on my own my learning outcomes.

The fourth domain, "interpersonal communication" is defined as the ability of learners to interact with others to promote their own learning (Question No. 17-20 stating My interaction with others helps me plan for further learning; I would like to learn the language and culture of those whom I frequently interact with; I am able to express messages effectively in oral presentations; I am able to communicate messages effectively in writing).

All items of SDLI are positively stated. The respondent is asked to rate each item on a 5-point Likert scale ranging from 1 for "strongly disagree" to 5 for "strongly agree". Thus, the total possible score on the SDLI ranges from 20 to 100. A higher level of SDL is indicated by a higher score.

The summary statistics were presented using frequencies with percentage for all response. SDLI score was calculated. No cut off value of the score is available in existing literature. It is mentioned that higher the score, better is the ability to learn. We supposed if students have low score like 2 in all responses the score becomes 40. If all students give 3 in all responses the score becomes 60. This is considered as the cut off as students have no positive response. If students give 4 in all responses, the score is 80. Students scoring 80 or above are considered as good learner and the score within 60 to 79 is considered as borderline score.

The reliability of the score in the present setting was determined by calculating Cronbach's alpha coefficient.

All data were analysed using SPSS software version 22.

The study was approved by Institutional Ethics Committee.

RESULTS

Out of a total 252 students (Current academic year: 250 & Old academic year: 2), 247 students (156 male, 91 female) took part voluntarily in the study.

In SDLI, the participants were asked to select their response from a Likert scale of 5-point rating: "strongly disagree," "disagree," "neutral," "agree," and "strongly agree." The percentage of frequencies for all such responses are presented in Fig 1.

Mean score of each item of SDLI is presented in Table 1. Only 2% students had strongly disagreed (Response 1) with the statements and 3% only disagreed (Response 2). 14% of the students remained neutral (Response 3). Majority agreed with the statement (Response 4, 46%) and rest strongly agreed (Response 5, 35%). From item mean, it seemed that students have poorest ability in Planning and Implementation domain (Mean: 3.9, variance: 0.26) whereas they are strongly motivated (Mean: 4.3, variance: 0.37).

Distribution of study population according to SDLI score is presented in Table 2. Though the cut off value was considered as 40, only 1 student was found below that score. 5 students were between 40 and 59. These 6 students need special care from faculties. A total of 81 students with score 60 to 79 need observation and monitoring. However, majority of students (160, 64.8%) scored above 80 and they are supposed to learn of their own. Table 3 shows Reliability statistics according to different domain expressed by Cronbach's alpha. Highest Cronbach's alpha was obtained for Planning and Implementation domain (0.852), followed by self-monitoring (0.807), self-motivation (0.786) and interpersonal communication (0.708).

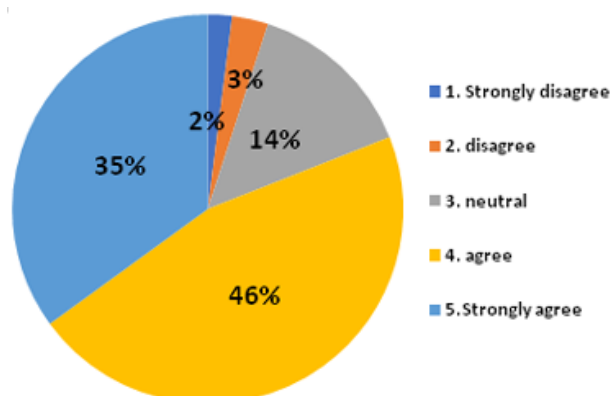


Fig 1 — Frequency distribution of response in percentage

Table 1 — Mean score of each item of SDLI

Item No	Statement	Mean score
Learning Motivation (LM)		4.4
1	I know what I need to learn.	4.1
2	Regardless of the results or effectiveness of my learning, I still like learning.	4.2
3	I strongly hope to constantly improve and excel in my learning.	4.6
4	My successes and failures inspire me to continue learning.	4.44
5	I enjoy finding answers to questions	4.3
6	I will not give up learning because I face some difficulties	4.42
Planning and Implementing (PI)		3.9
7	I can pro-actively establish my learning goals.	4.0
8	I know what learning strategies are appropriate for me in reaching my learning goals.	3.8
9	I set the priorities of my learning.	4.1
10	Whether in the clinical practicum, classroom or on my own, I am able to follow my own plan of learning.	3.9
11	I am good at arranging and controlling my learning time.	3.6
12	I know how to find resources for my learning.	3.8
Self-Monitoring (SM)		4.06
13	I can connect new knowledge with my own personal experiences.	4.1
14	I understand the strengths and weakness of my learning.	4.2
15	I can monitor my learning progress.	4
16	I can evaluate on my own my learning outcomes.	3.9
Interpersonal Communication (IC)		4.07
17	My interaction with others helps me plan for further learning.	4.3
18	I would like to learn the language and culture of those whom I frequently interact with.	4.3
19	I am able to express messages effectively in oral presentations.	3.6
20	I am able to communicate messages effectively in writing	4.1

DISCUSSION

CBME has emphasized that from teacher Centric Learning Process must be replaced by Student Centric Learning process. One of such approaches is Self-directed learning, which is supposed to help the medical students to become lifelong learner and fulfil one of the goals of an Indian Medical Graduate³. But there are certain pre-requisites to learn successfully by Self-directed learning process. Students need to be focused and self-motivated. They should be able to assess themselves and thus monitor own learning process. They should plan according to their need and implement various methods of learning to achieve their goal. They need to communicate facilitators and other resource persons or their peers or seniors for necessary help. Medical students in first year are too young to have all these qualities.

Total score of SDLI	Male	Female	No of students	Percentage	Remarks
Below 40	1	0	1	0.4%	Needs special care
40 - 59	4	1	5	2%	
60 -79	44	37	81	32.8%	Needs to observe and monitor
80 and above	107	53	160	64.8%	Can learn of their own
Total	156	91	247	100%	

In this study, the maximum score in SDLI was for item 3 (Mean score: 4.6), that states, "I strongly hope to constantly improve and excel in my learning, which is similar to the study by Bhandari, *et al* (Score:4.7)⁶. The minimum score of 3.6 was given to item 11 and 19. Item 11 states that "I am good at arranging and controlling my learning time and Item 19 states that "I am able to express messages effectively in oral presentations." Bhandari, *et al* also reported that students are poor in time management⁶. Moreover, they need to develop their interpersonal communication skills and express themselves orally. High score was also found in Item 4, stating, "My successes and failures inspire me to continue learning' (Score: 4.44), and Item 6, stating "I will not give up learning because I face some difficulties." (Score: 4.42). Bhandari, *et al* also got high score in Item 4. In fact, domain wise highest mean score was observed in learning motivation domain (Table 1). Mean scores of all individual items were above 4.1. Domain wise, lowest mean score was observed in Planning and implementation domain. Except Item 7 and 9, mean score of all individual items were below 4.

Self-monitoring domain shows that, they are aware of their strengths and weaknesses for learning (mean 4.2), can connect new knowledge with their personal experiences (4.1), can monitor own learning progress (Mean score:4). Unlike Bhandari, *et al*, mean scores of the interpersonal communication domain is better in our study. The only difficult part for them was expressing themselves orally (Mean score:3.6).

From Table 2; it is obvious that 2.4% students with SDLI score definitely need special guidance to learn by SDL. Another 32.8% students, with SDLI score between 60 to 79 needs to be observed and monitored. Rest 64.8% students can study of their own.

In the current situation SDLI was found to be reliable as Cronbach's alpha for internal consistency of 4 domains were between .708 to .852, which is similar to Shen, *et al* (0.755 - 0.825)⁵.

Name of Domain	No of item	Cronbach alpha
Learning motivation	6	0.786
Planning and implementing	6	0.852
Self-monitoring	4	0.807
Interpersonal communication	4	0.708

CONCLUSION

This study shows that SDLI is a reliable tool to assess the ability of phase 1 MBBS student to learn by Self-directed learning process. In the study majority of the students (64.8%) were found to learn of their own. Rest of the students need either some special guidance (2.4%) or monitoring by faculties (32.8%). Domain wise assessment shows students are motivated but they lack in planning and implementation of their abilities. Self-monitoring domain and interpersonal communication domains are more or less acceptable. Limitation of this study is that the result solely depends on self-assessment of the students. We have no scope to verify whether it is correct or not. The outcome of the study is we can identify the students with poor ability to learn by themselves in the very beginning of the session. Special attention can be given to them to overcome their difficulties and facilitate them to grow as lifelong learner.

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