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Perception of medical undergraduate students about interactive lectures in an outcome-based integrated curriculum: A cross-sectional study

Mohammad Rehan Asad, Khwaja Amir, Naser Ashraf Tadvi, Kamran Afzal, Waqas Sami¹, Abdul Irfan²

Abstract:

OBJECTIVE: The objective of this study is to explore the student's perspectives toward the interactive lectures as a teaching and learning method in an integrated curriculum.

MATERIALS AND METHODS: This cross-sectional study was conducted among 1st, 2nd and 3rd year male medical students ($n = 121$). A self-administered questionnaire based on the Visual, Auditory, Reader, Kinesthetic learning styles, learning theories, and role of feedback in teaching and learning on five-point Likert rating scale was used. The questionnaire was constructed after extensive literature review.

RESULTS: There was an 80% response rate in this study. The total number of undergraduate medical students responded in the study were $n = 97$, 34 students of 1st year, $n = 30$ students of 2nd year and $n = 33$ student were in 3rd year, the mean scores of the student responses were calculated using Independent samples Kruskal–Wallis. There was no significant difference in the responses of the students of different years except for the question “The Interactive lectures facilitate effective use of learning resources.” Which showed significant difference in the responses of the 3 years students by Independent samples Kruskal–Wallis test. No significant association was found between the year of study and items of the questionnaire except for the same item, “ The Interactive lectures facilitates effective use of learning resources” by Spearman rank correlation test.

CONCLUSION: The students perceive interactive lecture as an effective tool for facilitating visual and auditory learning modes, and for achieving curricular strategies. The student find the feedback given during the interactive lectures is effective in modifying learning attitude and enhancing motivation toward learning.

Keywords:

Feedback, integrated system based curricula, interactive lectures

Introduction

In the last three decades, medical curricula has moved from traditional subject-based approach toward integrated system-based teaching.^[1] Barriers between basic medical science and clinical disciplines, high amount factual knowledge, and obsolete assessment were the main identified drawbacks by the experts favoring reformed curricula.^[2,3]

The explicitly defined learning outcomes, multiple instructional approaches, and authentic assessment tools are the main features of outcome-based education.^[4,5] The Mc Masters in Canada was one of the pioneers in implementing integrated curricula in medical education.^[2] The integrated medical curricula emphasizes more on the active learning methods such as problem-based learning where learners

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Department of Basic Medical Science, College of Medicine, Majmaah University, ¹Department of Public Health and Epidemiology, College of Medicine, Majmaah University, ²Department of Medical Education, College of Medicine, Majmaah University, Saudi Arabia

Address for correspondence:

Dr. Mohammad Rehan Asad,
College of Medicine, Majmaah University, Al Majmaah, Saudi Arabia.
E-mail: Rehanasad698@gmail.com

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can construct their own knowledge based on the prerequisite knowledge.^[6] These learning approaches seem to be better aligned with constructivist and social learning theories. The medical education research ranked lecture as least effective in comparison with practicals and small group learning methods.^[7] Even though the lectures hold its ground as an important instructional method due to the convenience in imparting theoretical context and methodologies.^[8] The large group learning/lectures have a tendency to support a passive learning if activities facilitating interactivity are not inculcated by the lecturer in the session.^[9] To address the concern of passive learning and reduced retention rates, experts advocated the replacement of “traditional didactic lectures” with “interactive lectures.”^[8-10] The interactive lectures differ from traditional didactic lectures in the terms of active engagement of students and role of tutor as a facilitator.^[10] Interactive lectures open a window for an active engagement, increased motivation, and attention span along with constructive feedback for students.^[11] In 2010, the College of Medicine, Majmaah University started as one of the newly established colleges in Saudi Arabia. The college has adopted an integrated outcome-based model of curriculum. The lecture rooms in the college are equipped with smart boards, speakers, and Wi-Fi internet access that facilitate interactive lecturing. Each year, the newly joined tutors attend the workshops on interactive lectures conducted by medical education department. The different specialties of medical sciences are integrated in the form of system-based modules which are delivered in twelve semesters of the programme. A mix of teaching and learning methodologies are used in the program. Interactive lecture is one of the important methodologies used in achieving learning outcomes of this curriculum. The students receive the topics covered in interactive lectures along with specific learning outcomes in form of module guide before the start of the course.

Many studies have been done to understand student feedback towards “Interactive lectures” in medical undergraduate program.^[12] In 2015, Saudi Arabia had around 25 medical schools and around two-third of them followed a student centered integrated outcome-based curriculum.^[13] Studies have been conducted in Saudi Arabia on the role of problem-based learning in an integrated curricula, but only few studies focused on the role of interactive lectures in an integrated outcome-based medical undergraduate program.^[14-16]

Objective

The objective of this study was to explore student’s perspectives toward the interactive lectures as a teaching and learning method in an integrated curriculum.

Material and Methods

This cross-sectional study was conducted in the College of Medicine, Majmaah University, Saudi Arabia from November 2015 to April 2016. Male medical students of first, second and 3rd year participated in this study. All students were included using complete enumeration sampling technique. Enrolled students were subjected to a self-administered questionnaire prepared based on the Visual, Auditory, Reader, Kinesthetic (VARK) learning styles and learning theories. The first four items in the questionnaire focused on the perception of students regarding facilitating visual, auditory, kinesthetic (VARK) learning and reading and writing skills by interactive lectures. The other items in the questionnaire were about the perceptions of the students regarding the facilitation of interactive lectures for vertical integration, horizontal integration, providing peer feedback, and stimulation of deep learning by interactive lectures as teaching and learning methods. The items regarding the modification of learning behavior by interactive lectures and learning environment were also added. A total of 21 items were covered in the questionnaire. Broadly, the items were categorized under four titles-VARK learning modes, professional development, learning behavior, and environment and curricular strategies. Feedback of students on teaching and learning was assessed on five-point Likert rating scale (0 = strongly disagree; 1 = disagree; 2 = true sometimes; 3 = agree; 4 = strongly agree). Teaching and learning methods should facilitates in achieving curriculum outcomes, and need to be aligned with curricular strategies, especially in outcome-based education. Keeping this in mind, relevant items were included in questionnaire. Five medical educators were approached to assess the content validity of the questionnaire. The questionnaire was assessed in the terms of representativeness and clarity. After modifications, the questionnaire was checked by Cronbach to study internal consistency and reliability. The Cronbach alpha value was 0.71 that showed the acceptability of the questionnaire. Along with Cronbach alpha, the corrected item/total correlation (TCITC) was repeated for each item with TCITC range of 0.379/0.644. The study was started after obtaining ethical approval from the Majmaah Institution Ethics Review Committee.

Statistical analysis

The data were entered and analyzed using IBM SPSS 23.0 (IBM Corp., Armonk, NY, USA). Differences in the responses of the students of different years were analyzed by Kruskal–Wallis test. Association between the year of study and items of the questionnaire was examined by Spearman rank correlation test. We selected these two tests as our study includes nonparametric data. $P < 0.05$ was considered as statistically significant. Continuous data are presented as mean and standard deviation (SD)

whereas categorical data are presented as number and percentage. Mean \pm SD for students response on different items of questionnaire was calculated using descriptives for Kruskal–Wallis test in SPSS 23.0.

Results

A total of 97 students participated in this study. The number of students from first, second, and third year were 34, 30, and 33, respectively. The response rate was 80%. The feedback of students on Likert 5 point scale for interactive lectures is detailed in Table 1. The mean scores of the student responses are given in Table 2.

A total of 68% and 59.7% of students agreed that interactive lectures facilitate visual and auditory learning, respectively. Only 39.2% and 44.3% students agreed that kinesthetic and read/write learning modes are facilitated by the interactive lectures in the given study settings.

A total of 47% students agreed that interactive lecture helps in developing their self-confidence while 41% agreed that an interactive lecture session facilitates the development of interpersonal skills. A total of 72% of the respondents agreed that an interactive lecture facilitates constructing of new knowledge based on prior knowledge and experience.

Table 1: Feedback of students on interactive lectures

Items	Strongly disagree, n (%)	Disagree, n (%)	True sometimes, n (%)	Agree, n (%)	Strongly agree n (%)
VARAK learning modes					
The interactive lectures are a reliable tool for facilitating visual/spatial learning	8 (8.2)	8 (8.2)	15 (15.5)	50 (51.5)	16 (16.5)
The interactive lectures are a reliable tool for facilitating auditory learning	2 (2.1)	9 (9.3)	28 (28.9)	37 (38.1)	21 (21.6)
The interactive lectures are a reliable tool for facilitating kinesthetic learning	13 (13.4)	16 (16.5)	30 (30.9)	23 (23.7)	15 (15.5)
The interactive lectures are a reliable tool for developing reading and writing skills	9 (9.3)	18 (18.6)	27 (27.8)	33 (34.0)	10 (10.3)
Professional development					
The interactive lectures helped in developing linguistic skills and self-confidence	8 (8.2)	15 (15.5)	27 (27.8)	38 (39.2)	9 (9.3)
The interactive lectures facilitate development of interpersonal skills	16 (16.5)	10 (10.3)	31 (32.0)	26 (26.8)	14 (14.4)
The interactive lectures facilitate development of intrapersonal skills	8 (8.2)	18 (18.6)	23 (23.7)	39 (40.2)	9 (9.3)
The interactive lectures develop problem-solving skills, decision taking ability and practical application of ideas	6 (6.2)	14 (14.4)	36 (37.1)	37 (38.1)	4 (4.1)
Receiving of the feedback, during the interactive lectures modify your attitude toward learning	5 (5.2)	6 (6.2)	35 (36.1)	41 (42.3)	10 (10.3)
Receiving of feedback during the interactive lectures sessions enhance your motivation and internal drive toward learning	5 (5.2)	7 (7.2)	31 (32.0)	38 (39.2)	16 (16.5)
Learning behavior and environment (deep learning, and multiple feedback)					
The interactive lectures provide interactive learning environment	9 (9.3)	22 (22.7)	22 (22.7)	28 (28.9)	16 (16.5)
The interactive lectures facilitate effective use of learning resources	2 (2.1)	4 (4.1)	23 (23.7)	41 (42.3)	27 (27.8)
The interactive lectures enhance retention of knowledge by practice, feedback and evaluation	7 (7.2)	0	28 (28.9)	51 (52.6)	11 (11.3)
The interactive lectures stimulate deep learning	6 (6.2)	3 (3.1)	28 (28.9)	43 (44.3)	17 (17.5)
The interactive lectures help in developing logical thinking and abstract concepts	5 (5.2)	16 (16.5)	30 (30.9)	37 (38.1)	9 (9.3)
The interactive lectures promote self-directed learning	5 (5.2)	11 (11.3)	32 (33.0)	31 (32.0)	18 (18.6)
The interactive lectures provide the opportunity of peer teaching and peer feedback	9 (9.3)	12 (12.4)	31 (32.0)	35 (36.1)	10 (10.3)
Curriculum strategies (curriculum outcomes and integration)					
The interactive lectures fulfill horizontal integration i.e., integration between different subjects of basic medical sciences	4 (4.1)	6 (6.2)	25 (25.8)	43 (44.3)	19 (19.6)
The interactive lectures fulfill vertical integration i.e., basic medical sciences, efficiently integrated with clinical sciences	6 (6.2)	5 (5.2)	39 (40.2)	28 (28.9)	19 (19.6)
The interactive lectures objectives are properly aligned with your assessment	6 (6.2)	9 (9.3)	25 (25.8)	37 (38.1)	20 (20.6)
The interactive lectures facilitates constructing of new knowledge based on prior knowledge and experience	8 (8.3)	0	18 (18.8)	50 (52.1)	20 (20.8)
The interactive lectures helped in achieving the curriculum outcomes	2 (2.1)	3 (3.1)	28 (28.9)	44 (45.3)	20 (20.6)

VARAK=Visual, Auditory, Reader, Kinesthetic

Table 2: Students response on different items of the questionnaire

Groups	Item/questionnaire	Mean±SD
VARK learning modes	The interactive lectures are a reliable tool for facilitating visual/spatial learning	2.60±1.12
	The interactive lectures are a reliable tool for facilitating auditory learning	2.68±0.99
	The interactive lectures are a reliable tool for facilitating kinesthetic learning	2.11±1.25
	The interactive lectures are a reliable tool for developing reading and writing skills	2.18±1.14
Professional development	The interactive lectures helped in developing linguistic skills and self-confidence	2.26±1.12
	The interactive lectures facilitate the development of interpersonal skills	2.13±1.27
	The interactive lectures facilitate the development of intrapersonal skills	2.24±1.12
	The interactive lectures develop problem-solving skills, decision taking ability, and practical application of ideas	2.20±0.95
	Receiving of the feedback, during the interactive lectures modify your attitude toward learning	2.46±0.95
	Receiving of feedback during the interactive lectures sessions enhance your motivation and internal drive toward learning	2.55±1.02
	Learning behavior and environment	The interactive lectures provide interactive learning environment
The interactive lectures facilitate the effective use of learning resources		2.90±0.93
The interactive lectures enhance retention of knowledge by practice, feedback, and evaluation		2.61±0.95
The interactive lectures stimulate deep learning		2.64±1.01
The interactive lectures help in developing logical thinking and abstract concepts		2.30±1.02
The interactive lectures promote self-directed learning		2.47±1.08
The interactive lectures provide the opportunity of peer teaching and peer feedback		2.26±1.10
Curriculum strategies	The interactive lectures fulfill horizontal integration, i.e., integration between different subjects of basic medical sciences	2.69±0.99
	The interactive lectures fulfill vertical integration, i.e., basic medical sciences, efficiently integrated with clinical sciences	2.51±1.06
	The interactive lectures objectives are properly aligned with your assessment	2.58±1.11
	The interactive lectures facilitates constructing of new knowledge based on prior knowledge and experience	2.83±0.98
	The interactive lectures helped in achieving the curriculum outcomes	2.79±0.88

VARK=Visual, Auditory, Reader, Kinesthetic, SD=Standard deviation

Table 3: Results of Kruskal-Wallis test

Groups	Item/questionnaire	Median	χ^2	P
VARK learning modes	The interactive lectures are a reliable tool for facilitating visual/spatial learning	3	1.57	0.45
	The interactive lectures are a reliable tool for facilitating auditory learning	3	0.93	0.62
	The interactive lectures are a reliable tool for facilitating kinesthetic learning	2	3.21	0.20
	The interactive lectures are a reliable tool for developing reading and writing skills	2	3.33	0.18
Professional development	The interactive lectures helped in developing linguistic skills and self-confidence	2	2.02	0.36
	The interactive lectures facilitate the development of interpersonal skills	2	1.08	0.58
	The interactive lectures facilitate development of intrapersonal skills	2	3.31	0.19
	The interactive lectures develop problem-solving skills, decision taking ability and practical application of ideas	2	6.22	0.04
	Receiving of the feedback, during the interactive lectures modify your attitude towards learning	3	2.98	0.22
	Receiving of feedback during the interactive lectures sessions enhance your motivation and internal drive toward learning	3	0.92	0.63
	Learning behaviour and environment	The interactive lectures provide interactive learning environment	2	1.94
The interactive lectures facilitate effective use of learning resources		3	9.08	0.01
The interactive lectures enhance retention of knowledge by practice, feedback, and evaluation		3	2.09	0.35
The interactive lectures stimulate deep learning		3	3.46	0.177
The interactive lectures help in developing logical thinking and abstract concepts		2	0.13	0.93
The interactive lectures promote self-directed learning		3	2.53	0.28
The interactive lectures provide the opportunity of peer teaching and peer feedback		2	3.51	0.17
Curriculum strategies	The interactive lectures fulfill horizontal integration, i.e., integration between different subjects of basic medical sciences	3	1.89	0.38
	The interactive lectures fulfill vertical integration, i.e., basic medical sciences, efficiently integrated with clinical sciences	2	0.75	0.68
	The interactive lectures objectives are properly aligned with your assessment	3	2.88	0.23
	The interactive lectures facilitates constructing of new knowledge based on prior knowledge and experience	3	2.49	0.28
	The interactive lectures helped in achieving the curriculum outcomes	3	1.40	0.49

VARK=Visual, Auditory, Reader, Kinesthetica

There was no significant difference in the responses of the students of different years except for the two questions “The Interactive lectures facilitate effective use of learning resources” and “The interactive lectures developed skills like problem solving, taking decisions, and practical application of ideas” showed significant difference in the responses of the 3 years students by Independent samples Kruskal–Wallis test [Table 3]. No significant association was found between the year of study and items of the questionnaire except for the item, “The Interactive lectures facilitates effective use of learning resources” by Spearman rank correlation test ($r_s = 0.20$).

Discussion

Learning style is defined as ‘the composite characteristic cognitive, affective, and physiological characters that serve as relative stable indicators of how a learner perceives.’^[17,18] Learning mode preference refers to the physiological sensory modality in which people expect information to come to them and the ways in which they prefer to deliver their communication.^[19]

As evident from literature, teaching and learning methods should facilitate in achieving curriculum outcomes. The methods need to be aligned with curricular strategies, especially in outcome-based education. Keeping this in view, we included relevant items in the questionnaire.

As stressed by Brown and Manogue, the feedback received from peer evaluation and student’s feedback is used to increase the effectiveness of the interactive lectures in this study settings.^[8]

A learning strategy that caters to all types of learners is considered as an active learning strategy. The “meshing hypothesis” states that there can be significant increase in learning if the learning environment is according to the predominant learning style.^[20] For an overall academic and professional development of medical students, constructive feedback is considered as commitment between teachers and students.^[21] Observations of our study showed a considerable agreement (52%) that an effective feedback during interactive lecture modifies learning attitude of the students. The findings of our study support taking students’ feedback. Fifty-five percent students in this study agreed that feedbacks during the interactive learning sessions enhance their motivation for learning. Saleh *et al.*^[22] in 2013 showed that interactive sessions help in developing self-confidence along with encouraging teamwork and providing positive reinforcement. In another study conducted by Jayakumar *et al.*^[23] (2016) 92% of students agreed that the interactive sessions motivated them to study more and 94% reported that interactive sessions builds their confidence. Our observations are in

accordance to the published studies. The smart board, internet access, speakers, and other relevant resources facilitates interactive lectures by effective transmission of knowledge, engagement, and generation of interest in students.^[8] In this study, we observed statistical significance for the item “The Interactive lectures facilitate effective use of learning resources.”

A study from China reported that 89.4% people prefer interactive session for better comprehension of the knowledge.^[24] In our study, 72% students reported that an interactive lecture helps in constructing new knowledge based on their prior knowledge and experience. Better understanding of biological concepts, stimulation of deep learning, enhanced basic science reflections on clinical applications, and vice-versa are the advantages of the integration in medical curriculum.^[25] Lindstrom and Shonrock^[26] have suggested that to maintain the interest of students in lectures; it should have contextual relationship of clinical and basic science subjects. The vertical and horizontal integration have been considered as an important tool to provide contextual learning in an interactive lecture session.^[27] A total of 63.9% of the students in our study agreed that the interactive lectures fulfill the horizontal integration, i.e., integration between different basic science subjects whereas 48.6% agreed that these interactive lectures fulfill vertical integration (i.e., integration of basic medical science subject with clinical subjects). According to the survey conducted by Hakea,^[28] interactive teaching methods seem to be more effective for improving students’ performance in comparison with traditional teaching methods.

Overall, our study provides important insights about student’s perspective about teaching and learning method in the given study setting. The results of this study may help medical teachers to take constructive feedback from students that will facilitate effective implementation of “interactive lectures” in teaching practice. The feedback may also help medical schools to review their teaching and learning methods in an integrated curriculum.

The kinesthetic learning modes are more often addressed in small group learning sessions done in practical sessions. Assigning short in-class reading and writing assignments during the sessions can cater the read/write learning modes. The student find the feedback given during the interactive lectures is effective in modifying learning attitude and enhancing motivation toward learning. The disagreement of the students toward the development of self-confidence and interpersonal skills is justified as the active learning approaches done in small group sessions such as problem-based learning and student-led seminars are more effective in developing self-confidence and interpersonal skills in comparison to

large group interactive sessions. The students identified interactive lectures as a facilitatory tool for achieving curricular strategies expect a gap was found in vertical integration.

Our study has limitations of sample size and inclusion of only male students. The sample represented only level one, two, and three students, i.e., Phase II (two and half year's duration consist of system-based modules mainly comprised of basic medical science subjects along with pathology, microbiology, biochemistry with 30% blend of clinical subjects) of the program. Phase III (Clinical) students, female students, and faculty members are also the important stakeholders of the process. Therefore, a future study on a larger sample size including female students, Phase III (Clinical phase) students, and faculty members will probably help in generalizing the findings.

Conclusion

Students perceive interactive lecture as an effective tool for facilitating visual and auditory learning modes. A greater percentage of the students disagreed that interactive lectures are an effective tool for kinesthetic and read/write learning modes. Medical colleges should include interactive lectures in their teaching curricula. A qualitative approach may help in identifying the common barriers in implementing the strategies for interactive lectures in medical teaching.

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Conflicts of interest

There are no conflicts of interest.

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