

Student preferences among the different teaching strategies employed by faculty in RAK Medical and Health Sciences University (RAKMHSU), UAE-An Interdisciplinary Study

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Abstract:

Background: Effective teaching learning methodologies beget effective learning in outcome based education. This study aimed at finding the teaching methodology that is most preferred by students of RAK Medical and Health Sciences University, (United Arab Emirates both in the basic sciences and in clinical teaching as they determine the attitude and performances of the students in medical and health sciences education.

Methods: Data was collected from Cross Sectional Survey with random selection and Convenience Sampling with a pre-validated questionnaire from consenting students from Medical, Dental, Pharmacy and Nursing colleges of the university on eleven teaching methodologies with options to agree, strongly agree, disagree and strongly disagree.

Results: Responses of 416 students were considered for statistical analysis. Out of the 416 students 125 males (25.9%) and 357 females (74.1%). questions related to the Clinical Skills methodology merited strongly agree response. Lectures without teaching aids was the least preferred (104 and 151 students).

Conclusion: The study concluded that in the medical university, students preferred Clinical Skills and student inclusive methodologies that had with critical thinking and problem solving skills to didactic lectures.

I. INTRODUCTION

The major assumption in any university which follows an outcome based curriculum is that good teaching has to happen. The coherence between teaching, assessment and learning outcomes facilitates this. Good teaching is defined as “getting most students to use the level of cognitive processes needed to achieve the intended outcomes that the more academic students use spontaneously”[1]. The more competent the healthcare professionals are, the higher the quality of patient care. Therefore, to facilitate the training of students to be effective health care professionals, the efficacy of teaching methodologies is taken into serious consideration in both preclinical as well as clinical years following the model of ‘constructive alignment curriculum’. ([1]. This study aimed at finding the teaching methodology that is most preferred by the students of RAKMHSU both in the basic sciences and in clinical teaching. This was important because the preferences of the teaching methodologies determine the attitude and performances of the students in their academic roles.

Modern education denounces lectures as generally ineffective method of teaching learning. However, a recent study found lectures as the ‘best teaching method’ as it provides all knowledge related to a topic, saving time[2]. Numerous studies have been conducted across different universities to grade or assess learning styles of students. There is an increasing need to check whether there is a match between learning styles and the methodologies and strategies employed in teaching. It is also important to assess how well the teaching methodologies and strategies are relevant to the learning styles and the student satisfaction in the teaching learning process. A study conducted in Minnesota lists teaching strategies and activities out of a focused brainstorming process conducted with general education, special education and teaching English as a Second Language[3].

Teachers are faced with the dual demand of meeting the demands of the intended outcomes of the curriculum and the

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more practical demands of the students to enhance their marketability for employment. With so many methods to choose from and implement, teachers are in a constant dilemma as to what works best for the students.

It can be observed that students with extensive exposure to information technology, use Internet for research and curriculum related work[4].

At present methods like simulations and other strategies adopted in teaching clinical decision making (CDM) Clinical Skills, Problem based learning(PBL),Case Based Learning (CBL), Case studies, assignments, lectures with or without teaching aids, Seminars, Team Based Learning(TBL) , Symposium, and Small Group Discussion (SGDs) are teaching methodologies employed in the RAK Medical and Health Sciences University (RAKMHSU). It is assumed that While a certain amount of bias could be granted to students, the general sense is that students are both rational and reliable sources of evidence as they are exposed to all kinds of instructional experiences [5]. It is imperative to focus on the students’ preferred learning methodologies as they have immediate implications for attitudes and academic performance[6].

In the published literature the lists of teaching methodologies are exhaustive [7]. However, some of the teaching methodologies adopted in this university are unique like Team Based Learning (TBL) and Problem Based Learning (PBL), which are fairly recent in medical education and are listed only in few studies[8]. As RAKMHSU focusses on teaching methodologies both in the basic sciences as well as clinical sciences, there is a need to adopt methodologies which make a systematic transition from teaching learning in the classroom contexts to the hands on clinical practices, in hospital environments. Studies suggest that there is still scope for improvement when it comes to clinical skills training [9][10]. This research aimed to find students’ preferences of different teaching strategies employed by the faculty in RAKMHSU.

II. METHODOLOGY

An online questionnaire was mailed to the students of the university in all four colleges in undergraduate and post graduate programs. Only those students who gave consent were included in the study.

The questionnaire was divided into two sections; the first section consisted of demographic data of the students.

The demographic details of the participants based on age, gender, nationality, program and academic year are represented in the tables 1-4.

Table 1. Distribution of the student’s nationalities.

Nationality 36 nationalities		
India	19.30%	93
Syria	15.80%	76
UAE	11.4	55
Iraq	10.4	50
Egypt	5.20%	25

Table 2. Distribution of the student’s program.

Program		
MBBS	173	35.90%
BDS	100	20.70%
Pharm	121	25.10%
BSN	28	5.80%
RNBSN	54	11.40%
MS Pharmacy	2	0.40%
MSN	4	0.80%

Table 3. Distribution of the student’s academic year.

Academic year		
I	183	38%
II	113	23.40%
III	96	19.90%
IV	54	11.25%
V	36	7.50%

Table 4. Distribution of the student’s gender.

Gender		
Male	125	25.90%
Female	357	74.10%

The Cross Sectional Survey was taken with random selection and Convenience Sampling from consenting students from four undergraduate Programs of RAKMHSU namely, Medical, Dental, Pharmacy and Nursing.

The second section of the questionnaire consisted of eleven teaching methodologies employed by the faculty in the teaching learning process.

The teaching methodologies were listed as follows

- (1) Clinical skills
- (2) Lectures with teaching aids
- (3) Case studies
- (4) Team Based Learning Methodology
- (5) Problem based learning
- (6) Small group discussion
- (7) Assignments
- (8) Lectures without teaching aids
- (9) Case Based Learning (CBL)
- (10) Seminars
- (11) Symposium

Each methodology had six questions.

- (1) I am very comfortable while conducting this teaching learning methodology
- (2) This methodology encourages for active student participation
- (3) This methodology effectively uses my teaching time in the class

- (4) This methodology helps improve the students grades in assessment
- (5) This methodology helps achieve teaching learning outcomes effectively
- (6) This should be recommended for medical and health sciences university curriculum

The responses to these questions were recorded as strongly agree, agree, disagree, strongly disagree.

III. RESULTS

A total of 482 students responded to the questionnaire. Out of them 66 students didn't give consent for participation. 416 students recorded consent and their responses were considered for statistical analysis.

Out of the 416 students 125 males (25.9%) and 357 females (74.1%).

From the responses of the students on the first question (figure 1), we found 146 (35%) strongly believed that the teaching methodology of clinical skills gives them the opportunity for effective participation in the subjects followed by Lectures with teaching aids 117(28%), which is followed by case studies 101(24%). 92 (22%) students strongly agreed with Team Based Learning and 77 (18%) strongly agreed with Case based learning and Small Group Discussions each.

Teaching Methodology	1. This methodology has given you opportunities for effective participation			
	Strongly Disagree	Disagree	Agree	Strongly Agree
Clinical Skills	15	27	208	146
Lectures with teaching aids	19	41	225	117
Case studies	25	38	224	101
Team Based Learning Methodology (TBL)	51	68	193	92
Case Based Learning (CBL)	32	46	232	77
Small Group Discussion (SGDs)	30	56	213	77
Problem based learning (PBL)	41	61	203	70
Assignments	37	103	202	60
Seminars	37	80	207	49
Lectures without teaching aids	70	159	133	44
Symposium	68	71	204	43

Figure 1. This methodology gives you opportunities for effective participation.

From the responses of the students on the second question (Figure 2), we found 151 (36%) strongly believed that the teaching methodology of clinical skills uses their learning time optimally. 131(31%) students strongly agreed that Lectures with teaching aids used their learning time effectively. 103 (24%) found case studies to use their time optimally in the class while only 85 (20%) students found Case based learning to use learning time effectively followed by Small group discussions. Down the list, students ranging from 79 (18%) to 35 (8%) numbers strongly agreed with Team Based learning, problem based learning, assignments, seminars, lectures without teaching aids and symposia as using their class time effectively. In fact, a clear 167 students disagreed with the notion that Lectures without teaching aids used the class time effectively.

Teaching Methodology	2. This methodology effectively uses your learning time in the class			
	Strongly Disagree	Disagree	Agree	Strongly Agree
Clinical Skills	15	30	201	151
Lectures with teaching aids	23	34	211	131
Case studies	24	40	220	103
Case Based Learning (CBL)	30	62	211	85
Small Group Discussion (SGDs)	31	71	196	82
Team Based Learning Methodology (TBL)	49	84	189	79
Problem based learning (PBL)	43	65	199	70
Assignments	42	120	184	57
Seminars	38	92	199	48
Lectures without teaching aids	64	167	134	40
Symposium	70	80	199	35

Figure 2. This methodology effectively uses your learning time in the class.

The question concerning a teaching methodology which helps improve a student's assessment grades again (Figure 3), a high number, 148 (35.5%) was followed by 123 (29.5) students strongly agreeing on the methods of clinical skills and Lectures with teaching aids are helping in improving their grades. Team based learning and Case studies had an almost equal number of students i.e. 107 and 106 (25%) who felt they helped improve their grades. There was a sudden drop in students strongly agreeing with the methodology helping their grades with 89 (21%) students agreeing with SGDs closely followed by assignments. Lectures without teaching aids had only 33 (7%) students agreeing strongly of helping with the assessments. The numbers between 84 (11%) and 36(8%) students strongly agreed with assignments, CBL, PBL, seminars and symposium as methods helping their scores.

Teaching Methodology	3. This methodology helps to improve your assessment grades			
	Strongly Disagree	Disagree	Agree	Strongly Agree
Clinical Skills	12	31	203	148
Lectures with teaching aids	24	29	223	123
Team Based Learning Methodology (TBL)	47	54	193	107
Case studies	19	42	218	106
Small Group Discussion (SGDs)	26	63	199	89
Assignments	35	71	212	84
Case Based Learning (CBL)	30	53	225	79
Problem based learning (PBL)	39	72	202	62
Seminars	37	88	201	48
Symposium	71	75	200	36
Lectures without teaching aids	73	171	126	33

Figure 3. This methodology helps to improve your assessment grades.

An important focus in the educational system is the Learning Outcomes which cements all other aspects of teaching learning (Figure 4). 151 (36%) students strongly agreed that Clinical Skills contributed to their achieving the learning outcomes. 130 (31%) students said lectures with teaching aids followed by case studies supported by 112 (27%) students. Thereafter the opinion is divided in descending order but without much difference on TBL, CBL, SGD, assignments 96(23%), 84(20%), 81(19%), 73(18%) followed by PBL, seminars and symposiums 64(15%), 50(12%), 45(10%) and finally 35 (8%) students voted for the lectures without teaching aids.

Teaching Methodology	4. This methodology contributes in achieving your learning outcomes			
	Strongly Disagree	Disagree	Agree	Strongly Agree
Clinical Skills	14	22	208	151
Lectures with teaching aids	17	36	214	130
Case studies	24	35	217	112
Team Based Learning Methodology (TBL)	48	64	194	96
Case Based Learning (CBL)	26	47	226	84
Small Group Discussion (SGDs)	26	62	203	81
Assignments	37	88	204	73
Problem based learning (PBL)	46	63	203	64
Seminars	38	79	210	50
Symposium	63	74	198	45
Lectures without teaching aids	70	160	135	35

Figure 4. This methodology contributes in achieving your learning outcomes.

The satisfaction (Figure 5) was highest in clinical skills methodology with 160 (38%) students strongly agreeing with it. 129 (31%) students strongly agreed with lectures with teaching aids, followed by case studies 108(26%). 89 (21%) students strongly agreed with high satisfaction with CBL. TBL, SGD, Assignments, PBL, and seminars are with 83(20%), 81(19%), 64(15%), 64(15%), 57(14%) respectively. Symposium and Lectures without teaching aids stayed at the lowest rung on satisfaction with only 36 (8%) and 30 (7%) students strongly agreeing with being satisfied.

Teaching Methodology	5. You are highly satisfied with this methodology			
	Strongly Disagree	Disagree	Agree	Strongly Agree
Clinical Skills	14	28	193	160
Lectures with teaching aids	18	46	201	129
Case studies	23	42	211	108
Case Based Learning (CBL)	27	54	212	89
Team Based Learning Methodology (TBL)	50	85	180	83
Small Group Discussion (SGDs)	27	66	200	81
Assignments	41	105	191	64
Problem based learning (PBL)	44	77	192	64
Seminars	34	89	194	57
Symposium	67	83	195	36
Lectures without teaching aids	88	164	124	30

Figure 5. You are highly satisfied with this methodology.

A high number of students 172 (41%) until now strongly agreed with clinical skills as a methodology to be recommended for medical and health sciences university teaching. Lectures with teaching aids have 148 (36%) students who suggest recommendation. Case studies, TBL, CBL, SGDs, Assignments PBL, and seminars are recommended for teaching by 121 (29%), 101(24%), 94(23%), 89(21%), 75(18%), 75(18%), and 64(15%) students. However, Symposium and Lectures without teaching aids again remain as the lowest rated with 44 (11%) and 36(8%) students opining with the methodologies to be recommended for medical and health sciences students (Figure 6).

Teaching Methodology	6. This should be recommended for medical and health sciences university teaching			
	Strongly Disagree	Disagree	Agree	Strongly Agree
Clinical Skills	18	21	186	172
Lectures with teaching aids	21	29	202	148
Case studies	19	31	214	121
Team Based Learning Methodology (TBL)	50	62	188	101
Case Based Learning (CBL)	25	46	219	94
Small Group Discussion (SGDs)	29	56	201	89
Assignments	43	79	205	75
Problem based learning (PBL)	42	65	190	75
Seminars	36	76	197	64
Symposium	66	68	203	44
Lectures without teaching aids	104	151	114	36

Figure 6. This should be recommended for medical and health sciences university teaching.

IV. DISCUSSION

Our study demonstrates that a high number of student’s preferred clinical skills as a teaching learning methodology as it enhances the skills, uses time optimally and improves the quality of participation. In another study conducted by this author and team on mind mapping of Howard Gardner’s Multiple Intelligences and learning styles among the health sciences students of the university--interpersonal, bodily kinaesthetic, and logical mathematical, intrapersonal and logical intelligences were among the first three dominant intelligences prevalent with variations in MBBS, BDS, Bpharm and BSN programs. Importantly, while the other intelligences mentioned here took the second, third or fourth places, interpersonal intelligence took the first place as the dominant intelligence in ALL the four programs in the medical and health sciences university[11].

The essential requirements of a good clinician are a good combination of interpersonal, kinaesthetic, intrapersonal and logical intelligences. Interestingly in this study too all four colleges of the university had clinical skills teaching as the most preferred methodology.

Clinical Skills methodology employs learning, experiencing, reflecting, thinking and acting, which are the bases of Kolb’s learning theory. The process of Clinical Skills learning is in tandem with Kolb’s four stage learning cycle-- Concrete Experience (CE) – feeling, Reflective Observation (RO) - watching, Abstract Conceptualization (AC) - thinking ,Active Experimentation (AE) – doing[12].

A systematic review identified and described a large number of tools designed for direct observation of medical trainees’ clinical skills with actual patients and only a few demonstrated sufficient evidence of validity to warrant more extensive use and testing[13]. The rationale of the clinical skills training is conducted in a systematic and safe way under simulation circumstances before their exposure to the real patient. Keeping with the outcome based learning the clinical teaching is programmed for them to be competent and tested according to the Miller’s (1990) famous Pyramid for assessment of learners’ clinical competence as suggested by Harden [14].

Lectures with teaching aids as a methodology adopts information technology in the form of PowerPoint presentation as a major aid in teaching in addition to other aids like Visualizers and other props to aid the dissemination of knowledge through demonstration. Next to clinical skills the students have found lecture with teaching aids as the preferred method although PowerPoint presentations are decried as simply leading to a professor's "improvement and/or modernization of their performance in the classroom" [15] without any significant effects on student learning [16]. However, Lectures with aids came next to clinical skills training in all the parameters as the advantages of PowerPoint presentations combined with other aids to optimise the teaching learning process through lectures.

In stark contrast lectures without aids were preferred as the last teaching methodology preferred although a study claimed that some students are most satisfied with the lecture method as the best teaching method with reasons being that it "provides all knowledge related to topic, time saving, students attentively listen lecture and take notes etc. when compared to the teaching methodologies like group discussion, individual presentation, assignment seminars, workshops, conferences, brainstorming, role play and case study." [2]. Didactic lectures were not preferred at all by students of all colleges.

The concern that students fell short of what is needed of today's jobs [17] is well solved by anchored teaching methodologies like case based studies, team based learning [17]. Our study finds students prefer methodologies which facilitate critical thinking and develop problem solving skills through these methodologies. Christopher Langdell is credited for the creation of the case method in law school and like most methodologies case based learning also found firm grounding in medical education [18]. Case study method is a powerful student-centred teaching strategy. Students select the case, which is usually a patient admitted in the hospital for treatment. They prepare a detailed note on presenting symptoms, physical examination findings and synthesize diagnosis and formulate management plan after detailed evaluation of the case. This helps develop an essential skill of writing medical record. They also explore the pathogenesis and possible outcomes of the condition.

Team Based Learning Methodology (TBL) is a learner centred methodology used in the university, described as bringing "together theoretically based and empirically grounded strategies for incorporating the effectiveness of small-group learning into large-group, lecture-oriented sessions" [19]. Team Based Learning is conducted in three phases. In the first phase, the study material is given to the students to read independently outside class. Next, the students write an individual readiness assurance test (IRAT) to assess their basic understanding of facts and concepts included in the study material given to them. Soon after the test, a group readiness assurance test (GRAT) is given to teams of 5-7 learners. These groups are preassigned and the answers are arrived at by consensus. Phase three is the discussion phase where teams share their answers to the application problems simultaneously for immediate comparison with other team's solutions.

Small groups discussions and assignments were less preferred but interestingly took precedence over Problem Based Learning which promised "facilitation of learning, Self-directed and lifelong learning and research into clinical reasoning" [20].

Problem based learning was introduced in RAKMHSU University a decade back. There have been exhaustive writings on the benefits of PBL as a methodology and videos of instruction models for PBL, and yet over the years it has been replaced by other preferred methods specially case studies, Case based Learning and Team Based Learning and not as a result of any "call for it to be abandoned" [21]. Perhaps preclinical students did "not respond well to the reasonably unstructured environment" [21] that PBL offered and the confusion of evaluating its efficacy and lack of clear advice whilst adopting PBL as a teaching learning methodology for medical students. In most discussions it was evident that there was no definitive guidance for a smooth and effective result and assessment of this methodology in the medical school whereas the college of pharmacy continues to practice it as a methodology. However, the students' preference still ranks along with the other colleges which mean PBL is not a preferred learning methodology. PBL can therefore be thought of as a small group teaching method that combines the acquisition of knowledge with the development of generic skills and attitudes and not necessarily a holistic approach for teaching learning [22].

V. CONCLUSION

Out of 416 students who responded, interestingly only 186 students (45%) students are exposed to the teaching methodology of Clinical skills which begins from the third year onwards. The other respondents were from year one and two. It can be safely assumed that these respondents looked forward to clinical skills as a desirable teaching methodology. All subsequent questions related to the Clinical Skills methodology merited 'strongly agree' response by the highest number of students.

In a medical university where students are more technology and laboratory oriented, didactic lectures without other teaching aids are rejected out rightly. A very small minority agrees with the methodology of lectures.

The teaching methodologies were shortlisted from the instructional strategies adopted to teach core subjects as well as general education subjects in all the constituent colleges of the university.

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VII. REFERENCES

- [1] J. Biggs and C. Tang, Teaching for Quality Learning, Open University Press, 2007.

- [2] S. Sajjad, "Effective teaching methods at higher education level," 20 June 2015. [Online]. [Accessed 27 Dec 2016].
- [3] N. C. o. E. Outcomes, "National Center on Educational Outcomes," 15 June 2015. [Online]. [Accessed 20 Dec. 2016].
- [4] G. Angadi, "Post Graduate Students Attitude towards the use of Internet," *International Journal of Education and Psychological Research*, vol. 1, no. 1, pp. 30-37, 2012.
- [5] R. A. Berk, "Survey of 12 Strategies to Measur Teaching Effectiveness," *International Journal of Teaching and Learning in Higher Education*, pp. 48-62, 2005.
- [6] M. Reyes, "measurement of online and classroom teaching Methologies of graduate students and its implications for academic achievement," *scientific international journal*, pp. 15-31, 2012.
- [7] T. u. o. N. C. a. Charlotte, "150 Teaching Methods," 25 June 2015. [Online]. [Accessed 15 Dec. 2016].
- [8] V. F. S. P. H. R. E. L. K. K. M. L. C. P. ., F. R. Britta M Thompson, "Team-based learning at ten medical schools: two," *Medical Education*, pp. 25-257, 2007.
- [9] K. C. B. L. K. D. Q. E. E. J. Guarino CM1, "Impact of instructional practices on student satisfaction with attendings' teaching in the inpatient component of internal medicine clerkships.," *J Gen Intern Med*, pp. 7-12, 2006.
- [10] W. P. R. M. R. J. V. J. B. T. Xu G, "Students' satisfaction and perceptions of attending physicians' and residents' teaching role.," *Am J Surg*, pp. 46-48, 1998.
- [11] Dr. Zita Lobo, D. E. S. A. F. El Zayat and O. Al jadaan, "Dominant Multiple Intelligences among Students of Medical and Health Sciences," presented in *The European conference on education*, 2014 Brighton, UK.
- [12] M. A. Bhat, "Understanding the Learning Styles and its Influence on Teaching/Learning Process," *International Journal of Education and Psychological Research*, vol. 3, no. 1, pp. 9-13, 2014.
- [13] H. E. H. K. Kogan JR, "Tools for direct observation and assessment of clinical skills of medical trainees: a systematic review.," *JAMA*, pp. 1316-1326, 2009.
- [14] S. L. Subha Ramani, "AMEE Guide no. 34: Teaching in the clinical," *Medical Teacher*, pp. 347-364, 2008.
- [15] A. H. N. Szabo, "Using IT in the undergraduate classroom. Should we replace the blackboard with PowerPoint?," *Computers and Education*, p. 175-187, 2000.
- [16] J. H. A. Russell J. Craig, "PowerPoint Presentation Technology and the Dynamics," *Innov High Educ*, pp. 147-160, 2006.
- [17] C. C. Block, *Teaching thinking: An agenda for the twenty-first century*, Routledge, 2009.
- [18] J. Redlich, "The common law and case method in American university law schools," Carnegie Foundation for the Advancement of Teaching, 1914.
- [19] D. D. N. J. B. Dean X. Parmelee, "Medical Students' Attitudes about Team-Based Learning in a Pre-Clinical Curriculum," *Med Educ Online*, pp. 14-1, 2009.
- [20] L. S. S. S. S. Elstein, *Medical Problem solving: an analysis of clinical reasoning*, 1978: Harvard university press.
- [21] B. M. David Taylor, "AMEE guide no. 36 problem-based learning: where are we now?," *Medical Teacher*, 2010.
- [22] D. F. Wood, "ABC of learning and teaching in medicine: Problem based learning," *BMJ*, pp. 328-330, 2003.