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## Teaching public health: seminar or lecture?

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### Abstract

**Introduction:** Several pedagogical methods can be used to impart medical education but the challenge is to make students appreciate critical thinking and apply their knowledge.

**Objectives:** We developed a strategy to train students in public health due to the managerial constraints and academic interest. The academic purpose was to avoid passive learning, increase student involvement, encourage interaction and make learning more engaging and effective.

**Methods:** Instead of delivering lectures, we encouraged the students to prepare seminars on topics of public health importance based on the guidelines provided by the lecturers and present them to their peers. The lecturers were present only to guide and supervise the students. Using a questionnaire, students' perception on the lecture and seminar mode of teaching was evaluated.

### Results:

**Lecture:** Organizational content and the learning outcomes were better ( $p=0.00$ ). Study material easily available ( $p=0.003$ ), useful ( $p=0.01$ ), better content ( $p=0.00$ ) and quality ( $p=0.00$ ). The students claim that there was more teacher guidance ( $p=0.00$ ), care for student learning ( $p=0.00$ ) and the interest and understanding in the subject taught increased ( $p=0.00$ ). Flow of the subject matter was also better ( $p=0.00$ ).

**Seminar:** More students assumed that their knowledge was adequate prior to the seminars ( $p=0.00$ ). They found the seminars to be difficult. Motivation to read about the topic was increased. Improved the students presentation skills ( $p=0.001$ ), communication skills ( $p=0.00$ ) and provoked interest in the topics taught ( $p=0.04$ ). Played a bigger role in student interaction, problem solving and teamwork. More students agreed that there was more student involvement and that seminar provoked their interest.

**Conclusion:** From the findings of this study we found that a combination of both the methodologies is ideal as both have strengths as well as weaknesses.

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### Introduction

Nearly a century ago, CEA Winslow defined public health as "the science and art of preventing disease, prolonging life and promoting health and efficiency through organized community effort" (Petrakova & Sadana, 2007).

The Alma Ata Conference of 1978 reaffirmed the critical role of public health in its vision of 'attaining health for all'. Public Health Medicine is an essential component of medical teaching in Malaysia. Medical students in Malaysia are required to learn the importance public health medicine through systematic and organized medical education.

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Malaysia's Director General of Health, Dr. Hj. Mohd. Ismail Merican in a keynote address quoted "In the field of medical education, we need action that is thoroughly discussed and one that is based on evidence to ensure that the education, training and acculturation of the future entrants to the medical profession will produce doctors who can respond to "real world" needs of society" (Merican, 2008).

In order for medical students to become effective medical practitioners, medical

education must be community oriented. Students should be encouraged to learn by intellectual discovery and critical thinking. The quality of training and its impact on students is dependant on many factors including faculty, curriculum, pedagogical methods, teaching aids, facilities and the students themselves, who have their own experiences and expectations (Petrakova & Sadana, 2007).

Stewart and Felicetti (1992) defined learning styles as those educational conditions under which a student is most likely to learn. Learning styles are actually "how" learners prefer to learn rather than "what" learners learn (Coffield *et al.*, 2004).

There is a shift in pedagogy in medical education. Most educators agree that lectures are necessary as lectures are an efficient ways of delivering information. They are able to introduce new material or synthesize student's concepts and can be delivered through myriad of methods but most would agree that lectures should be limited in number (Tyler *et al.*, 2009).

Active learning has been defined as the process of involving students in doing things and thinking about the things they are doing (Bonwell & Eison, 1991). Usually active learning involves 'small group learning'. Small group learning encourages deeper level of learning compared with lectures. In this form of teaching, the students are encouraged to be hands on and interactive by discussing and interpreting results (Tyler *et al.*, 2009). This type of student centered education involves placing the responsibility of learning on the students with the proper and adequate help of teachers (University of Arizona, 2004). Student centered learning encourages active participation from the students and the results is that they tend to be learn more (University of Arizona, 2004; Cross, 1987).

Medical education can be assessed by several methods including feedback from students, evaluations, videotape review, workshops, seminars, microteaching etc. But due to the difficulty of some of these methods and the time commitment required in some institutions which have severe shortage of teaching staff as is the case in most countries including Malaysia, (Thuraisingham, 1985) the implementation of these forms of assessment becomes impractical to implement (Skeff *et al.*, 1986). The purpose for implementing seminars as the main method of teaching was due to both managerial and academic reasons.

Because of the constraints in manpower and in order to make the training in public health learning more meaningful and interesting, we tried a student led seminar approach for selected topics taught in the public health department. This paper describes the student's perception on lectures and seminars modes of teaching.

## **Materials and Methods**

### ***Background place of study***

This study was conducted in the medical faculty of a private University. This institution is situated in north Malaysia, in which the medical programme is the flagship of the university. The medical programme in is a five year course and the community medicine department is involved in the teaching of the students during first, third, fourth and the final year of the programme.

### ***Sample***

The study was conducted among fourth year medical students who had just completed the community medicine posting. A total of 54 students who were in the fourth year of the medical programme in 2009, participated in this study.

### ***Description***

As part of the curriculum for the medical degree awarded by this institution, students are posted to the Community Medicine department in the fourth year for a period of four weeks. This posting is designed to create awareness among students on the importance of participating in and contributing to the success of national health programmes implemented by the division of public health under the Ministry of Health. Students are introduced to relevant health programmes at the national, state and district levels and they experience firsthand how the public health system works on the ground.

This fourth year posting is called the 'public health posting'. The objectives of the posting are given in table 1. Generally the method of teaching the students is by lectures supplemented with PBL's and student led seminars. But in this instance due to the constraints of manpower and logistics, a completely student led seminar was chosen as the method of teaching. The purpose was to empower the students with the responsibility of learning and to avoid passive learning. We hoped that this would lead to active student involvement and encourage interaction, making learning more engaging and effective.

Instead of delivering lectures, students were encouraged to prepare seminars on topics of public health importance based on the

guidelines provided by the facilitators. The Facilitators responsibility was to guide and supervise the students.

**Table : Objectives of the Public Health Posting**

<b>Posting</b>	<b>Component</b>	<b>Objectives ( students are expected to learn)</b>
	Health Infrastructure	<ul style="list-style-type: none"> <li>• Structure and function of various levels of healthcare</li> <li>• Number of health facilities</li> <li>• Health Personnel and their responsibilities</li> <li>• Budget allocation</li> </ul>
<b>Family health</b>	MCH Nutrition	<ul style="list-style-type: none"> <li>• Scope of family health</li> <li>• Factors affecting family health</li> <li>• Family health acts</li> <li>• Family health programmes by the MOH</li> <li>• Indicators used for evaluation</li> <li>• Maternal health services</li> <li>• Elderly and child health services</li> <li>• Nutritional assessment skills</li> <li>• Job responsibilities and infrastructure</li> </ul>
<b>Disease control</b>	CDC NCDC	<ul style="list-style-type: none"> <li>• Disease surveillance systems including computerized systems</li> <li>• Vaccines and immunization</li> <li>• Programmes by MOH</li> <li>• Notification methods</li> <li>• Control programmes</li> <li>• Job responsibilities and infrastructure</li> <li>• Strategies for Epidemic investigation</li> </ul>
<b>Food quality control</b>	Food sampling Premise inspection Issuance of cert for food export Enforcement	<ul style="list-style-type: none"> <li>• Local laws and regulations</li> <li>• Basis and methods of premise regulation</li> <li>• Methods of sample collection</li> <li>• Job responsibilities and infrastructure.</li> </ul>
<b>Water supply and sanitation</b>	Safe water supply Sanitation Solid waste Drainage	<ul style="list-style-type: none"> <li>• Methods of safe water supply</li> <li>• Disposal of waste</li> <li>• Sampling of water</li> <li>• Excreta and sewage treatment</li> <li>• Waste management</li> <li>• Job responsibilities and infrastructure</li> <li>• Water Quality Monitoring</li> </ul>
<b>Vector borne disease</b>	Dengue, Filariasis and malaria	<ul style="list-style-type: none"> <li>• Vector control programmes structure, functions and job responsibilities</li> <li>• Vector Control measures</li> <li>• Laws on vector control</li> </ul>
	Emergency preparedness	<ul style="list-style-type: none"> <li>• Preparedness for various types of emergencies including disease outbreaks</li> <li>• Contingency plans</li> <li>• Personnel involved</li> <li>• Training for preparedness and</li> <li>• Budget allocation</li> </ul>
	Training programmes	<ul style="list-style-type: none"> <li>• Types of training programmes</li> <li>• Personnel involved in training</li> <li>• Frequency of training</li> </ul>

The first week of the posting involved the preparation of student led seminars with the guidance of the facilitators. They were given certain topics to prepare and they were required to find the source materials from internet as well as the library. During the second and the third week of the posting they were posted in groups to five different district health offices, where they were required to see firsthand the system in progress.

The students were required to interact with the health personnel and elicit information on their:

- a) Training
- b) Job responsibilities
- c) Community interaction
- d) Planning and scheduling
- e) Records maintenance
- f) Reports generated and dispatched
- g) Response to feed back from higher authorities and the community

The students observe these activities both in the office and in the field. In the last week of the posting, a student led seminar presentation on the same topics that they had in the first week were held. They were now expected to fill in the knowledge gaps that they had during the first presentation. This was done by presenting what they had learned during their posting in the district health office. The seminars were again prepared with the help of the same facilitators who were involved in the seminar preparation prior to their field visit.

Seminars were used to help the students develop an interest in the subject matter and encourage them to search for facts and information as well as develop group work. They were expected to think critically and creatively to prepare presentations. Table 2 shows the seminar schedule. Each one hour seminar would contain the following information at the very least:

- i. objective
- ii. policy
- iii. administrative structure
- iv. activities
- v. programmes
- vi. procedure of program evaluation

### **Tools**

A questionnaire specially designed for this study was used. The questionnaire was used to evaluate the student's perception on the seminar method of teaching with lecture mode of teaching which the students experience for

other subjects taught in the school. The questionnaire was divided into two sections. The first section had questions pertaining to the general aspects of teaching, content organization, teacher support and knowledge evaluation. Section 2 the students overall impression on the teaching methods and the learning styles was assessed using a likert scale. A 'lecture' was considered to be an oral presentation by the lecturer with minimal interactions between the lecturer and the student and a 'student led seminar' was one where the students prepared and presented selected topics by researching from multiple sources with the help and guidance from the lecturers.

### **Ethics**

The study was conducted ethically. Informed consent from the respondents was obtained and confidentiality of the subjects was maintained. The approval of the institute's ethics committee was obtained prior to the study.

### **Analysis**

Data analysis was done using SPSS version 13.0. Descriptive statistics and cross tabulation were done. Chi square test was applied for comparison of various aspects of teaching-learning covered in lectures and seminars. The 't' test was used to compare the mean scores allocated by the students for the learning styles of the lecture and seminar modes. A 'p' value of <0.05 was considered statistically significant.

### **Results**

As shown in table 3, more students assumed that their knowledge was adequate prior to the seminars ( $p=0.00$ ). They found the seminars to be difficult when compared with lectures and there was more flow of the subject matter in lectures as compared to the seminars ( $p=0.00$ ).

There was no significant difference in the statement of objectives but the organizational content and the learning outcomes were better in lecture mode than in seminars as shown in table 3 ( $p=0.00$ ). The study material was easily availed ( $p=0.003$ ) and more useful ( $p=0.01$ ) in the lecture mode. The students claim that there was more involvement and teacher guidance ( $p=0.00$ ) and care for student learning ( $p=0.00$ ) in lecture modes.

**Table 2: Schedule of the seminar presentations**

Week	Day	Seminar
<b>ONE</b>	1	Introduction to history of public health 1 Health infrastructure 1 Health promotion 1 Epidemiology of diarrhoeal diseases 1
	2	Epidemiology of non communicable diseases 1 Family planning 1 Disease surveillance 1 Epidemiology of vector borne diseases 1 Emergency preparedness 1
	3	Occupational health 1 Water supply and sanitation 1 Health management Information system 1 Primary health care 1 Investigation of an outbreak 1
	4	Epidemiology of tuberculosis 1 Adolescent health 1 Child health 1 Food quality control and nutrition 1
	5	Maternal health 1 Geriatric Health 1
<b>FOUR</b>	1	Introduction to history of public health 2 Health infrastructure 2 Health promotion 2 Epidemiology of diarrheal diseases 2
	2	Epidemiology of non communicable diseases 2 Family planning 2 Disease surveillance 2 Epidemiology of vector borne diseases 2 Emergency preparedness 2
	3	Occupational health 2 Water supply and sanitation 2 Health management Information system 2 Primary Health care 2 Investigation of an outbreak 2
	4	Epidemiology of tuberculosis 2 Adolescent health 2 Child health 2 Food quality control and nutrition 2
	5	Maternal health 2 Geriatric Health 2

They also claim that the interest in the subject taught increased with the lecture modes ( $p=0.00$ ). The understanding of the topics was increased much more using the lecture mode ( $p=0.00$ ) but the motivation to read more about the topic was higher in the seminar mode. However this finding was not statistically significant.

Table 4 shows the overall impression on the teaching methods. The students found the lectures to have better content ( $p=0.00$ ) and quality ( $p=0.00$ ). Seminar mode improved the students presentation skills ( $p=0.001$ ) and

helped develop better communication skills ( $p=0.00$ ) and provoked interest in the topics taught ( $p=0.04$ ).

Figure 1 shows the opinions of the students on the learning styles of the two teaching methods. Majority of the students strongly agreed that the seminar mode played a bigger role in student interaction, problem solving and teamwork. More students agreed that there was more student involvement in seminar mode and that seminar provoked the interest amongst the students.

**Table 3: Comparison of various aspects of learning by use of lecture and seminar modes**

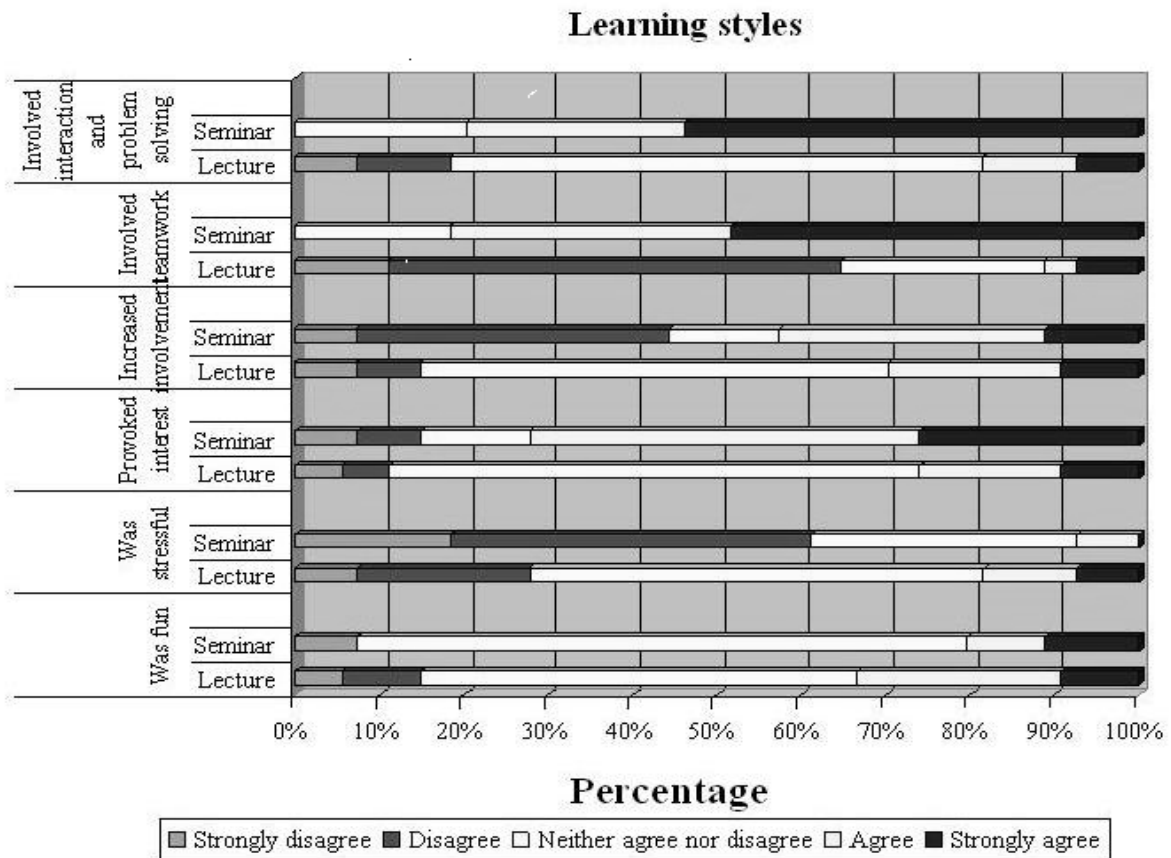
Variable		Teaching Learning Method		Chi square	P value	
		Lecture	Seminar			
<b>General aspects</b>	Prior knowledge assumed*	Adequate	18(33.3%)	40(74.1%)	18.	0.00
		Inadequate	36(66.7%)	14(25.9%)	03	
	Amount of material covered	Adequate	50(92.6%)	45(83.3%)	2.1	0.14
		Inadequate	4(7.4%)	9(16.7%)	9	
Degree of difficulty*	Easy	39(72.2%)	4(7.4%)	47.	0.00	
	Difficult	15(27.8%)	50(92.6%)	34		
Flow of subject *	Yes	53 (98.1%)	38(70.4%)	15.	0.00	
	No	1(1.9%)	16(29.6%)	71		
<b>Content organization</b>	Statement of objectives	Clear	48(88.9%)	47(87.0%)	0.0	0.77
		Not clear	6(11.1%)	7(13.0%)	87	
	Organization of the content*	Good	54(100.0%)	43(79.6%)	12.	0.00
Poor	0	11(20.4%)	24			
Learning outcomes*	Clear	50(92.6%)	38(70.4%)	8.8	0.00	
<b>Teacher Support</b>	Availability of study material*	Unclear	4(7.4%)	16(29.6%)		0.003
		Easy	19(35.2%)	6(11.1%)	8.7	
		Difficult	35(64.8)	48(88.9)	9	
	Usefulness of study material*	Useful	50(92.6)	40(74.1)	6.6	0.01
		Not useful	4(7.4)	14(25.9)	7	
	Involvement and guidance of teacher*	Important	52(96.3%)	8(14.8%)	72.	0.000
		Not important	2(3.7%)	46(85.2%)	6	
Interest in the subject*	Increased	47(87.0%)	18(33.3)	35.	0.00	
	Decreased	1(1.9%)	4(7.4%)	52		
	No change	6(11.1%)	32(59.3%)			
Care for student learning*	Adequate	43(79.6%)	19(35.2%)	21.	0.000	
	Inadequate	11(20.4%)	35(64.8%)	81		
<b>Knowledge evaluation</b>	Understanding of the topics*	Increased	50(92.6%)	29(53.7%)	21.	0.000
		Decreased	0	4(7.4%)	14	
		No change	4(7.4%)	21(38.9%)		
Motivation to read more about the topic	Increased	48(88.9%)	49(90.7%)	4.4	0.10	
	Decreased	1(1.9%)	4(7.4%)	7		
	No change	5(9.3%)	1(1.9%)			

\*p<0.0

**Table 4: Comparison of rating of the two learning styles**

Attribute	Mean scores		Paired difference in Mean scores	t test	Sig. (2tailed)
	Lectures	Seminars			
Content	3.89	3.02	0.87	5.14	<b>0.00</b>
Clarity	3.54	3.43	0.11	0.56	0.58
Quality	3.85	3.07	0.78	4.56	<b>0.00</b>
Ability to motivate self directed learning	3.22	3.30	-0.08	-3.56	0.72
Ability to improve presentation skills	2.80	3.63	-0.83	-3.51	<b>0.001</b>
Development of communication skills	2.67	3.59	-0.92	-3.94	<b>0.00</b>
Involvement of teacher	3.89	3.61	0.28	1.56	0.13
Provoked interest	3.20	3.78	-0.58	-2.03	0.04

Figure 1 : Comparison of the opinions on learning styles of the two teaching learning methods



## Discussion

The typical lecture form of teaching lacks student and teacher interchange, it poorly encourages active learning and different learning styles (Bonwell & Eison, 1991; Chickering & Gamson, 1987; Prince, 2004). A report from the United Kingdom entitled 'Tomorrows doctors' recommended reduction of passive methods of teaching such as lectures and increase active learning (General Medical Council, 1993).

According to a report from Canada, lectures are an efficient way of delivering information but are not as effective as small group sessions when it comes to stimulating thinking, inspiring interest in the subject, teaching behavioral skills or changing attitudes (Tyler, 2009). In this study, however, the students claimed that there was more teacher involvement and guidance as well as student care in lecture mode. The students also claimed that in lecture mode the interest in the subject taught and the understanding of the topics increased. They also claimed that lectures had better content and quality.

Small group learning encourages active learning and develops communication and teamwork skills. It also develops problem solving skills, attitudes and the acquisition of interpersonal skills (Tyler *et al.*, 2009). Similarly we found that the motivation to read more about the topics increased in the seminar mode. Seminar mode also improved the student's presentation skills and helped develop better communication skills and provoked interest in the topics taught

Stimulation by classmates, knowledgeable and creative faculty and personal contact between students and instructors form a good and health learning environment (Curry *et al.*, 2000). Majority of the students in this study felt that the seminar mode played a bigger role in student interaction, student involvement, problem solving, teamwork and provoked interest. Students who learn by an interactive and hands method of learning are able to master their subjects, develop independence and become problem solvers, critical thinkers and lifelong learners (Curry *et al.*, 2000).

The students in this study found the seminars to be difficult as compared with lectures. This

is not surprising as the responsibility of learning is placed on students. In a study conducted in India to determine the opinions of students regarding the teaching of pharmacology, only 1.6% wanted more student seminars while majority wanted more case studies, increase use of audio visual aids and the introduction of group discussions (Garg *et al.*, 2004)

Learning is multidirectional (Savery & Duffy, 1995). From the findings of this study, we can conclude that a combination of both the methodologies is ideal as both have strengths as well as weaknesses. In a study to compare student knowledge gained from CD ROM based lecture only, from attending small group seminars only and from a combination of both methodologies among second year medical students in the University of California showed that the change from pre test to post test was greater for students who participated in combined modalities (Xakellis *et al.*, 2005).

### Conclusion and Limitations

Active learning is a critical tool for facilitating learning in the classroom. Development of critical thinking and interpersonal skills along with communication is the key to efficient learning. Various teaching methods are utilized to make learning more effective and fun. Our study revealed that students felt that both lectures and seminars are important in their training and a combination of both the methodologies is ideal as both have strengths as well as weaknesses.

This study has some limitations. We have attempted to compare the student's perception about the strengths and weaknesses of the traditional lecture mode and seminars. However, the lectures were conducted for subjects other than public health while the seminars were used as a teaching technique for public health, hence there is a possibility of bias in this comparison. Nevertheless the findings of the study highlight the importance of using seminars as an additional tool to enhance collaborative learning and critical thinking.

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