

# Health for all: comparing apprenticeship with traditional classroom learning in community oriented medical education (COME)

## Abstract

In the last few decades, a substantial effort has been made globally to mould medical education in accordance with the needs of the local community of a region. The objective of this study was to ascertain whether apprenticeship could substitute the prevalent, traditional classroom learning in order to make the medical education in Pakistan more community oriented. A cross sectional study was conducted for six months. Selection was based on purposive sampling. A total of 300 students were recruited for the study, with the inclusion criteria being enrolled in 4th year MBBS of King Edward Medical University, Pakistan, studying the subject of community during 3rd year MBBS. Informed consent was obtained; data were collected through a pretested questionnaire and analysed through SPSS version 23. Medical apprenticeship was defined as a contract between a senior doctor and a medical student, combining on-the-job training, formal learning and productive work in a clinical/practical setting for a period of 9 months, 12 hours a week. Classroom based learning was defined as one in which the medical students are taught by medicine, and having prior 1-year experience of apprenticeship in the form of ward rotations the delivery of lectures for 12 hours a week for a period of 9 months, within the premises of classroom, accommodating at least 300 students, without demonstrating the practicality of theory on a subject/patient. The results indicated 90% of the students believed apprenticeship to promote greater knowledge retention, instilling confidence in the students to apply medical knowledge, and to carve their own professional identity (p value<0.05). However, apprenticeship was deemed as more exhausting (69.0%), prone to favouritism (59.3%) and harassment (79.0%). With reference to Community Medicine, 70.0% wanted apprenticeship to be utilized in teaching. As far as the implementation is concerned, only 39.3% students believed that this change would be easy to adopt in the current setup.

**Keywords:** apprenticeship, classroom based learning, community oriented medical education, community medicine, developing countries, experience based learning, public health, harassment

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Abbasi A,<sup>1</sup> Rubab K,<sup>1</sup> Malik R,<sup>1</sup> Ishaque A,<sup>1</sup> Riaz K,<sup>1</sup> Noshaba Shafquat,<sup>2</sup> Anwar J,<sup>1</sup> Ghufuran K,<sup>1</sup> Ahmadur Rehman,<sup>1</sup> Farhan Khan<sup>1</sup>

<sup>1</sup>Medical graduates (MBBS), King Edward Medical University, Pakistan

<sup>2</sup>MPhil Student, Institute of Public Health, Pakistan

**Correspondence:** Ayesha Abbasi, Medical graduates (MBBS), King Edward Medical University, Lahore, Pakistan, Tel 0530724117, Email [abbasi.ayshaali@gmail.com](mailto:abbasi.ayshaali@gmail.com)

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## Introduction

The year 2018 marks the 40<sup>th</sup> anniversary of the Alma Ata Conference, at which the slogan of “Health for All” was raised. This year, as WHO and UNICEF reaffirm the belief that primary health care is the key to achieving this goal, it is befitting to review the potential causes of our failure to have achieved the same. Our research paper explores the notion that the system of medical education in the developing countries has not been appropriately modified to cater to the needs of the local communities. It also discusses whether the answer to achieving Health for All lies in the uniform implementation of apprenticeship mode of learning, by promoting community oriented medical education. Apprenticeship is defined as a contract between an employer and a young person, combining on-the-job training, formal learning and productive work.<sup>1</sup> In this way, a novice learns cognitive and metacognitive skills from an expert.<sup>2</sup> Apprenticeship is based on scaffolding, modelling, mentoring and coaching. The concept of apprenticeship dates to the Greek philosophers; Plato was the apprentice of Socrates. However, with the advent of standardized curricula and formal classroom teaching, the age-old practice of apprenticeship witnessed a decline. The concept of apprenticeship regained popularity in the early 20<sup>th</sup> century. In 1921, Douglas described apprenticeship as “a higher form of trial and error process, entertaining a large amount of imitative emotion and preceding all theoretical instruction”.<sup>3</sup> In 1989, Collins defined apprenticeship

as “a guided learning experience based on cognition”.<sup>4</sup> Lave and Wenger gave the concept of “legitimate peripheral participation”, in which apprentices learn a job as they traverse the path to becoming seasoned professionals.<sup>5</sup> Traditional classroom learning is a teacher-centric learning in which teachers serve as instruments through which knowledge is imparted to students, without including experiential learning.<sup>6</sup> The evidence about the superiority of one mode of learning over the other is divided.

In support of apprenticeship, a study demonstrated that competent implementation of apprenticeship which incorporates experience-based learning produces better learning outcome than passive transfer of knowledge by classroom teaching.<sup>7</sup> Dornan et al concluded that not only practical knowledge but also a state of mind that includes a sense of professional identity, motivation and confidence is required to produce a competent professional.<sup>8</sup> In a study assessing the significance of mentorship in the professional development of primary care fellows in the United States, 49.3% respondents reported the role of a sustained, influential mentor at the time of survey who had prepared them well for their current position (p=0.0009).<sup>9</sup> A number of studies have also supported the traditional classroom teaching. In a cross-sectional study conducted on medical students in Malaysia, 72% of the study population preferred lecture-based teaching and only 6% voted for early clinical exposure.<sup>10</sup> According to one study, traditional, blackboard presentation was favoured by students from

biomedicine and medicine courses.<sup>11</sup> In another study, the majority of students preferred PowerPoint presentations over the traditional, chalk and talk method of teaching.<sup>12</sup> In the third world countries, there is non-critical adaptation of the western health care system. However, a creative solution is required to address the local needs and to overcome immense challenges, such as high maternal and infant mortality rates,<sup>13</sup> poor access of women to health services,<sup>14,15</sup> low contraceptive usage in rural populations,<sup>16</sup> failure to eradicate poliomyelitis,<sup>17,18</sup> and an alarming prevalence of hepatitis B(7.4%) in the general population.<sup>19</sup> Therefore, the medical education in Pakistan and other developing countries needs to be more congruous with the local needs of their communities.

## COME

Community-oriented medical education (COME) has been defined as a medical education which produces health-oriented professionals, equipped with broad skills and able to work for health promotion, disease prevention, and cure.<sup>20</sup> Researchers have shown that primary prevention and health promotion can prevent up to 70 % of disease burden.<sup>21,22</sup> In a study conducted on 948 medical students in Iran, medical students preferred field training in community-oriented medical education as compared to training in the clinics of hospitals(p<0.0001).<sup>23</sup> The lack of progress in investigating the effects of practice outcomes to reform community-oriented medical learning<sup>24</sup> has been the subject of recent editorials and reviews.<sup>25</sup> Despite the researches cited above, there are still many sectors of education where the effectiveness of apprenticeship mode of learning lies unexplored. One such field is the subject of Community Medicine which is taught by a traditional, classroom-based method to the medical students in Pakistan. Our aim is to assess whether the apprenticeship mode of learning can be adopted in teaching the subject of Community Medicine to the medical students, in order to promote a community-oriented medical education. This will be a step towards the much-needed educational reforms in the developing countries. It will also help align the health workforce of these countries according to the WHO guidelines (WHO report 2016), which place emphasis on early clinical exposure and apprenticeship-based learning to promote not only competence and professionalism, but also empathy towards the people with health issues. Only by making the necessary reforms in the field of medical education can developing countries like Pakistan hope to make advancement in the modern world.

## Subjects and methods

A cross sectional study spanning 6 months from April 2016 to September 2016 was conducted in a public-sector medical university of Pakistan. The sample size calculations were performed by using epi-info 2000 software. Total 300 subjects were recruited in the study with the inclusion criteria being enrolled in 4<sup>th</sup> year MBBS of King Edward Medical University, studying the subject of Community

Medicine and having prior 1-year experience of apprenticeship in the form of clinical rotations in 3rd year MBBS. Written informed consent was obtained and data were collected by a pretested questionnaire preformed. The synopsis was approved by the ethical committee. Medical apprenticeship was defined as a contract between a senior doctor and a medical student, combining on-the-job training, formal learning and productive work in a clinical/practical setting for a period of 9 months, 12 hours a week. Classroom based learning was defined as one in which the medical students are taught by the delivery of lectures for 12 hours a week for a period of 9 months, within the premises of classroom, accommodating at least 300 students, without demonstrating the practicality of theory on a subject/patient. All the qualitative variables were presented in the form of frequency and percentages. Chi square test was applied and p values were calculated. Data entry and analysis were done by statistical software SPSS version 23.

## Results

A total of 300 students were included in the study. When assessed with respect to better cognitive outcome, students preferred the apprenticeship mode of learning in terms of generating greater interest (97.0%), and promoting active (95.0%) and collaborative (90.0%) learning. It also led to better comprehension (86.7%) and knowledge retention (97%). They students believed that the apprenticeship mode maintains their level of interest (97.0%) and helps them stay more focused (78.0%). They also found it better for polishing their interpersonal skills when it comes to interacting with the teachers (96.7%), patients (96.7%), and their colleagues (90.7%). The students inclined towards apprenticeship mode as the teachers are more facilitating (76.3%), helping them achieve better scores (68.3%), and involving performance-based assessment (90.3%). Apprenticeship was the clearly favoured mode when it came to better career-building (94.7%) due to an effective combination of providing greater professional development (96.7%) and boosting the confidence levels when practicing medicine (97.7%). The students regarded apprenticeship to be the faster (94.7%), more productive (96.3%) and catering to students' needs. Apprenticeship was found to have its own limitations, on account of being physically exhausting (69.0%), prone to favouritism (59.3%), and rendering students more vulnerable to harassment (79.0%). With respect to the subject of Community Medicine, 61.3% students believed that topics such as malnutrition, immunization and control of infectious diseases could be learnt better by apprenticeship in a practical setting. Even with the availability of multimedia assisted lectures, about 70% students preferred the apprenticeship mode for learning a practical subject like community medicine. When asked which system they would want to be implemented if a change is made in the current system, 69.9% opted for apprenticeship mode of learning. However, only 39.3% thought that it would be easy to adopt in our current setup. Tables 1–3 show the statistically significant results of our study (Figure).

**Table 1** Statistical relations of faster mode of learning

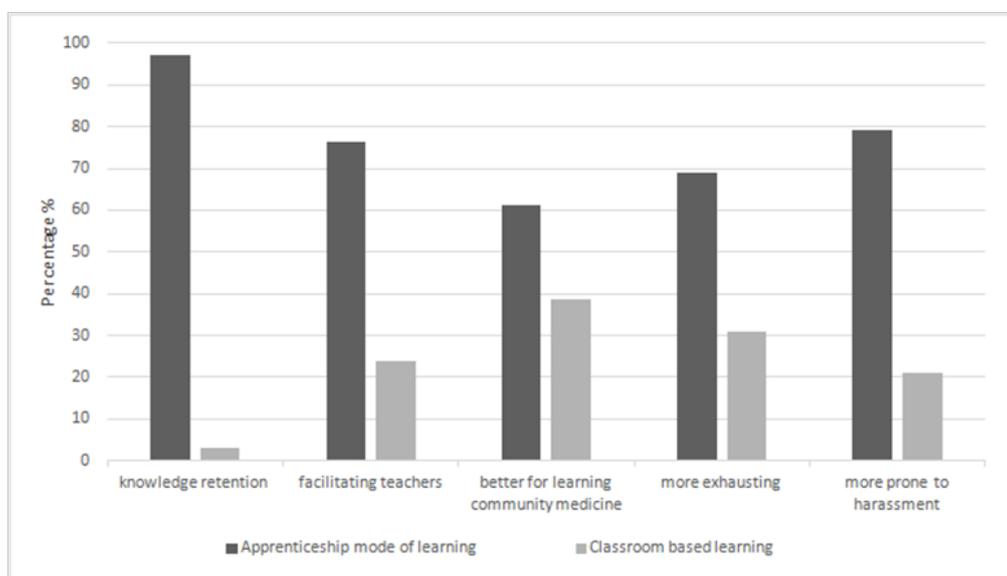
	Apprenticeship		Classroom teaching		Chi-square value	P value
	Freq	%	Freq	%		
<b>Faster mode of learning</b>						
Better level of interest	291	97	9	3	5.242	0.022
More efficient	265	88.3	35	11.7	6.29	0.012
Caters to students' needs	279	93	21	7	15.267	0
Encourages active learning	285	95	15	5	24.518	0.04
Preference in our setup	283	94.3	17	5.7	20.694	0

**Table 2** Statistical relations of scoring better

	Apprenticeship		Classroom teaching		Chi-square value	P value
	Freq	%	Freq	%		
<b>Scoring better</b>						
More facilitating teachers	229	76.3	71	23.7	11.31	0.001
Performance based assessment	271	90.3	29	9.7	10.779	0.001
Collaborative learning	270	90	30	10	26.744	0
Promotes active learning	285	95	15	5	8.939	0.003
Standardized Curriculum based	135	45	165	55	11.767	0.001
Preference in our setup	283	94.3	17	5.7	9.091	0.003
Effective in the long run	277	92.3	23	7.7	20.545	0

**Table 3** Statistical relations of Professional development

	Apprenticeship		Classroom teaching		Chi-square value	P value
	Freq	%	Freq	%		
<b>Better professional development</b>						
Better knowledge retention	291	97	9	3	25.915	0.002
Interaction with patients	290	96.7	10	3.3	8.918	0.003
Boosting confidence	293	97.7	7	2.3	14.168	0
Better application of knowledge	291	97	9	3	10.274	0.001
Interaction with patients	290	96.7	10	3.3	8.918	0.003



**Figure 1** Bar chart showing frequency of some important variables.

## Discussion

### COME- An evolving concept

Community-oriented medical education (COME) has been defined as a medical education which produces health-oriented professionals, equipped with broad skills and able to work for health promotion, disease prevention, and cure.<sup>20</sup>The concept of COME has evolved into a community-based medical education, CBME, in which medical students are stationed and taught in the community setting for a particular period of time. This can work as a community outreach

program in which community serves as an educational asset to enrich the learning of students by offering experiential learning. In return, the students function as an active health workforce by assisting their seniors in providing primary health care to the understaffed<sup>26</sup> rural community.

### Benefits of COME

One of the benefits of promoting primary health care is that the disease burden could be reduced by 70% if effective health promotion and disease prevention strategies.<sup>27</sup>

Another benefit was the superior learning outcome of apprenticeship demonstrated in a study conducted in Australia, in which one group of medical students was taught by apprenticeship of specialist consultants in a rural community for a year, and the other group studied the same curriculum in a tertiary-care teaching hospital. The first group consistently outperformed the second group in the end-of-year examinations.<sup>28</sup>

Students who are demonstrated the practicality of community medicine in a rural setting are more likely than their colleagues to opt for rural practice in the underserved communities.<sup>29</sup>

Our study was designed to assess whether the medical students in Pakistan were sensitive to the need for a change in the teaching strategies prevalent in medical education. Subjects were asked to compare two modes of learning; apprenticeship and traditional classroom learning, and to choose which mode would prove more influential in promoting community oriented medical education in Pakistan.

### Knowledge and comprehension

Apprenticeship emerged as the preferred mode of learning by the students recruited in our study. About 93% students believed that apprenticeship would be more student-centred and cater to student's needs much better. It was deemed as a more interesting mode (97.0%) as compared to the traditional classroom learning. A vast majority (93.3%) of students were of the view that apprenticeship would stimulate greater student participation and would facilitate interaction between the students and the teacher (96.7%). This would transform the dull and dreary, pedagogical process of learning dramatically. In a classroom, a teacher serves merely as an instrument for transmitting knowledge to passive subject. In contrast, apprenticeship promotes active participation from the students.<sup>25</sup> This not only transpires to better comprehension (86.7%) and retention of knowledge (97.0%) on the part of the students, but also instils a sense of satisfaction and professional fulfilment in the teacher.<sup>30</sup> This arrangement benefits both the students and the teacher, with the students getting hands-on experience and the teacher utilizing the students as a helping hand. This is in accordance with a study in which the students described participation as a core learning condition.<sup>25</sup> Our study subjects believed that teachers were more accessible (76.7%) and keener to teach in apprenticeship as compared to the classroom (65%). This is in contrast to a study in which the respondents, despite favouring apprenticeship in all aspects, claimed that the teachers were less accessible in a clinical setting due to their tremendous workload and professional commitments.<sup>25</sup>

### Developing cognitive skills

Cognitive thinking refers "to a learner's purposeful and conscious manipulation of thoughts and ideas toward logical learning."<sup>31</sup> It is the ability to apply theoretical knowledge to novel situations in order to reach a reasonable solution. In our study, ninety-seven (97.0%) students were of the view that apprenticeship would inculcate the ability of cognitive thinking in the students, by frequently propelling them into novel situations, which called for the application of theoretical knowledge. This result is comparable with a study, in which the students reported that learning with a clinical perspective prompted higher order thinking in the students.<sup>32</sup> Ninety-five (95.0%) students reported that apprenticeship motivates them for self-learning, and awakens in them the desire to prove their worth to their mentor. It also promotes a positive attitude toward learning, awareness of their

own cognitive levels and aims for developing high-level learning abilities.

### Polishing clinical skills

Apprenticeship provides an excellent opportunity to the students to upgrade their clinical skills. A mentor may allow his/her apprentice, "legitimate peripheral participation"<sup>35</sup> in the clinical setting, which paves way for full-fledged participation in the future. The students can apply their knowledge and skills on the patients, initially under the direct supervision of their mentor and later independently. The adage "practice makes a man perfect" "only holds true for practice under supervision; otherwise, one might master a wrong technique or method, without ever knowing so, to the detriment of his professional identity and his patients' health. Practice under supervision can be accomplished beautifully in the setting of apprenticeship. In our study, 96.7% students believed that apprenticeship would help them acquire the clinical acumen and confidence (97.7%) for future medical practice. This result is similar to the study in which respondents believed that training, supervision and feedback offered by their senior supervisors would equip them with better clinical skills and boost their morale.<sup>25</sup>

### Interpersonal skills

Apprenticeship is instrumental in developing interpersonal skills of medical students by encouraging interactive and collaborative learning. Mutual discussion among students might be viewed as a nuisance and even cheating in the classroom, but the same is regarded as teamwork and shared knowledge construction in the setting of apprenticeship. About 96.7% students believed that apprenticeship would help them form long lasting professional liaison with their seniors. These established professionals, if impressed by the work of their mentee, could vouch for them in future or even hire them.<sup>30</sup> About 94.7% students believed that apprenticeship would help them in making the right career choice, according to their aptitude and interest, by enabling them to get first-hand experience in that field. This was demonstrated in a study involving apprenticeship in Biochemistry.<sup>30</sup>

### Limitations of apprenticeship

Despite favouring apprenticeship in most aspects, only 68.3% students thought that apprenticeship would help them score better in the current, theory-oriented examination system of their medical university. This suggests that in order to reap the fruits of medical apprenticeship, our examination system needs to evolve by incorporating more problem based and less theoretical questions. Studies have shown that students in community-based curricula perform similar or better than their colleagues on traditional courses with respect to knowledge, skills, attitudes and exam scores.<sup>34</sup> Apprenticeship was rated to be more exhausting (69.3%) as well as posing a greater risk of favouritism (59.3%) and harassment (79.0%). The issue of abuse and harassment may be tackled by strict implementation of laws regarding workplace harassment.

### Shifting emphasis from classroom to field

A number of African medical schools placed their students for a significant period of time in areas afflicted with floods or other natural calamities. Under the supervision of their teachers, the students provided basic medical consultations and helped in rebuilding the destroyed infrastructure.<sup>35</sup> In our study, about 70.0% students asserted that topics like immunization and malnutrition could be better comprehended in a practical setting. Learning these topics in the field

on actual patients might be a step towards promoting Community Oriented Medical Education (COME).

### Strengths and weaknesses of our study

The strength of our study is that it has garnered the opinions of students studying in one the most prestigious medical universities of Pakistan. However, our study has not explored the hurdles in the path of implementing apprenticeship in our set up, especially in the field of Community Medicine. Further research is suggested to explore and eliminate these hurdles.

### Conclusion

Our study has shown that apprenticeship is the preferred mode of learning as compared to the traditional classroom-based learning, especially for learning the subject of Community Medicine. This will not only yield a superior learning outcome for students but also help the developing countries in achieving the goals of primary health care. The medical students, with their idealistic approach and unflinching spirits, must collaborate with public health experts, in order to materialize the dream of Health for All.

### Recommendations

The compulsory subject of Community Medicine, which is currently taught for one year in the classrooms, should be taught in the community setting. Medical students should be stationed for a designated amount of time in the communities, so that they can contribute to the health workforce of the country. WHO should collaborate with the medical councils of the developing countries in order to ensure that medical students are actively involved in promoting primary health care at all levels.

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### Conflicts of interest

The author declares there is no conflict of interest.

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