

Comparative Study of Professional Competences of Graduates of Innovative and Conventional Medical Schools in Kenya: A Case of Graduates of Moi and Nairobi Universities

Anastasiab Kimeu^{1*}, Harun arap K. Mengech², Alfred Mutema³ & Simon Kangethe⁴

¹ AMREF/Capacity Kenya Project

² Moi Referral and Teaching Hospital, Eldoret

³ Kenya Methodist University, Meru

⁴ Department of Medical Education, Moi University, School of Medicine, Eldoret

*Corresponding author email: akimeu@intrahealth.org

Abstract

A population of 280 intern doctors was randomly sampled using Gay's (1992) sample estimate of 20%. An increase of 10% in the sample accounted for non-response. The desired random sample size was therefore 84 intern doctors. A purposively selected sample of 47 supervisors from a population of 140, which included medical doctors and nursing officer in charges, was also assessed. A total of 54 (63% questionnaires) from graduates were returned with 26 of these from graduates of school of medicine- Moi university, while 28 were returned from University of Nairobi. A total of 47 (100%) questionnaires were returned from supervisors. The graduates from the conventional school rated themselves 82% on the *excellent* category in the knowledge of scientific foundation of medicine while the graduates from innovative school ratings were 89% on the same category. On further analysis of the results, there was no significant difference between the graduates. The ratings of supervisors on graduates from conventional school (56%) and those from innovative school (53%) on this competence showed no significant difference either. The majority of graduates of the two schools considered themselves highly competent in clinical skills (76% IMS; and 79% CMS). However, there was no significant difference between the ratings of proportion of graduates from the two schools. The findings on supervisors ratings (70%, 30% IMS; and 70%, 30% CMS) of graduates showed no significant difference. The graduates from the two medical schools do not differ at all as perceived by their supervisors on the seven global competences. However, there seems to be significant differences in the way graduates perceive themselves with regard to six competences as shown in the study. The author notes that these differences may be due to limitation of the self assessment method used in the study, which does not always provide for objective information as was the case in graduates' ratings. However, this limitation applied equally to respondents of the two universities, the differences between the graduates from the two schools of medicine can be indicative of the effects resulting from the different curricula used.

Keywords: Comparative study, professional competences, innovative, conventional, curricula, intern.

IJPP 2011; 2 (3): 285–296

Introduction

The curricula for training medical doctors once reformed should include rigorous brand of systematized and experiential medical education. According to Cook (2006), citing Abraham Flexner's study on America's medical education in 1910, showed that there is an overwhelming importance of preventive medicine, sanitation and public health as important indicators of modern life, which set apart medical profession as an organ differentiated by society with an important purpose to fulfill. Flexner, maintained that the state government is the proper instrument for regulating medical education, because social welfare is inextricably linked to the quality of the nation's physicians. He viewed a physician as a social instrument.

Literature Review

The definition on innovative education approach has been widely accepted according to Maudsley (2001) and Subramanian *et al* (2004). It refers to an education or training programme that has been planned, developed and implemented using new concepts and principles or approaches that focus on ensuring that the programme is appropriate, relevant, effective and produces graduates with competences that are required in the practice of medicine in different working environments. The conventional approach refers to teacher centeredness, information gathering, discipline-based, hospital-based, and uniform in its approach, which is conducted essentially on apprenticeship. This approach has been widely used in training of doctors for many years. However, there has been a major shift in both developed and developing countries towards the adoption of innovative approaches in planning, development and implementation of medical education programmes. Some of these approaches include the use of models that focus on context, inputs, processes and

products (CIPP) in aligning education and training to meet societal needs. Another model widely used is the student-centered, problem solving, integrated, community based/oriented strategy with electives and conducted through a systematic (SPICES) approach (Harden, 2000).

The CIPP model, which uses the open systems approach, is an important approach that is currently utilized. According to Isaac and William (1995), the CIPP model constitutes the culmination of work on educational evaluation studies, which was first developed by Stufflebeam *et al* (1971) in assessing educational programs in the USA. Evaluations using context help prioritize goals, input assess different approaches used, process evaluations assess the implementation of plans, and product evaluations assess the outcomes (both intended and not intended). The CIPP model thus advocates that "the purpose of evaluation is not to prove, but to improve."

According to Brown *et al* (1997), the context of learning is an important factor when education and training institutions plan and design their educational processes. This is because the context of learning influences how students are developed to learn. According to Schmidt (2006), acquisition of knowledge is indeed an active process and that learning in a relevant context enables more acquisition that is translated to better retention and transfer of knowledge.

The two medical schools in Kenya, whose graduates are in medical practice, need to critically re-examine their programmes taking into consideration the overall context in which the programmes are implemented. The CIPP model used in this study focuses on the seven minimum global professional competences of the product i.e. graduates of the two medical schools as they practice their profession in their field of work.

Methodology

According to Slavin (1984), a study conducted from a carefully selected sample that represents the population helps to save time, funds and energy. The study used Slavin's principle of sampling. The target population for this study was 327 respondents comprising of medical officer interns (280) and their supervisors (47) who included nursing officers in charge, medical superintendents, and medical doctors in charge of wards/departments.

Selection criteria

Public hospitals were included in this study because they receive graduates deployed as interns and doctors and nurses in large numbers than in private ones. Provincial hospitals were included in the study because of the great number of patients attending the hospitals and the fact most doctors in the country work at this level according to the National Health Sector Strategic Plan II (2005-2010).

Apparatus

A coded self-administered questionnaire was used to collect data from graduates and their supervisors. The questionnaire had 64 indicators pervading through the seven competencies and used to determine the level of competence of the MB.Ch.B graduates. Qualitative data was

collected through focus group discussion guide using a sample of two groups of interns (male and female).

Design and analysis:

Data was collected and analyzed using *Microsoft Excel* program and *Epi Info 2005 3.3.2* software. Descriptive statistics were used to calculate frequencies and percentages of categorical variables. Measures of central tendency and dispersion were used for continuous data. The Chi-square test with Yates Correction Continuity with $p=0.05$ and 1 df was used to determine significant differences between ratings of graduates and supervisors on the seven global competences of graduates of the two medical schools. Data was presented using tables and bar charts.

Results

The study targeted both male and female respondents. The majority of the respondents were female supervisors (60%) compared to the graduates (41%) as shown in Table 1 and Figure 1. On further analysis of the result, there was significant difference $\chi^2 = 6.48, 1df, p < 0.05 [0.010]$ between the proportion of male and female respondents in the study.

Table 1: Distribution of Respondents by Gender

	Graduate n = 54		Supervisors n = 47	
	No.	%	No.	%
Males	32	59	19	40
Female	22	41	28	60
Total	54	100	47	100

HEALTH

Type of medical school

The majority of the respondents were male graduates (61%) from the conventional medical school as compared to (58%) from innovative medical school as shown in Table 2 and Figure 2. On further analysis of the

results, there was no significant difference $\chi^2 = 0.00, 1df, p > 0.05 [0.959]$ in gender distribution in the two medical schools. Therefore, the proportion of male to female graduates included in this study did not differ.

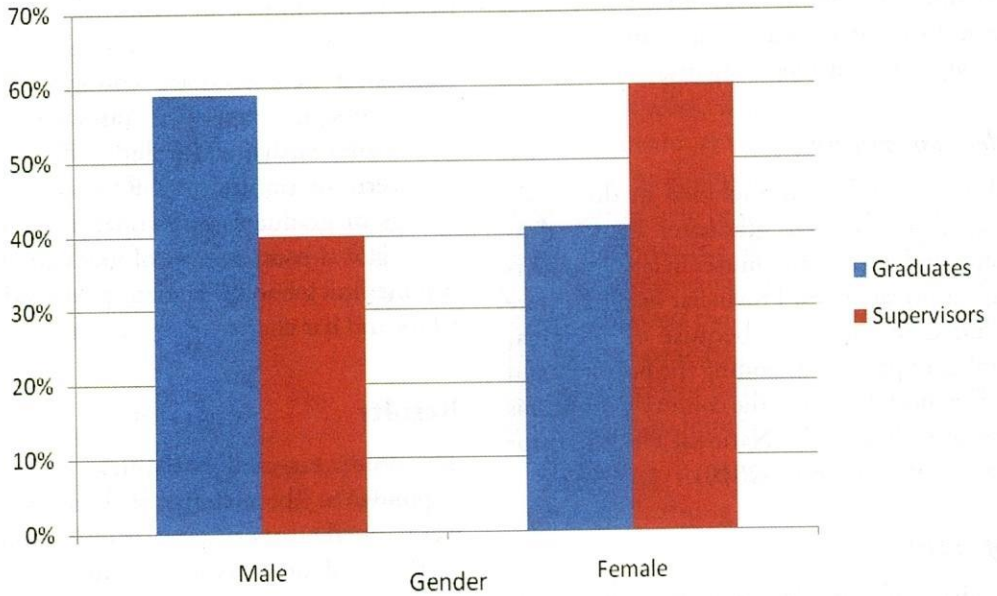


Fig 1: Distribution of Respondents by Gender

Table 2: Distribution of Graduates by Type of Medical School

Graduates				
Gender	Innovative Medical School n=26		Conventional Medical School n=28	
	No.	%	No.	%
Female	11	42	11	39
Males	15	58	17	61
Total	26	100	28	100

HEALTH

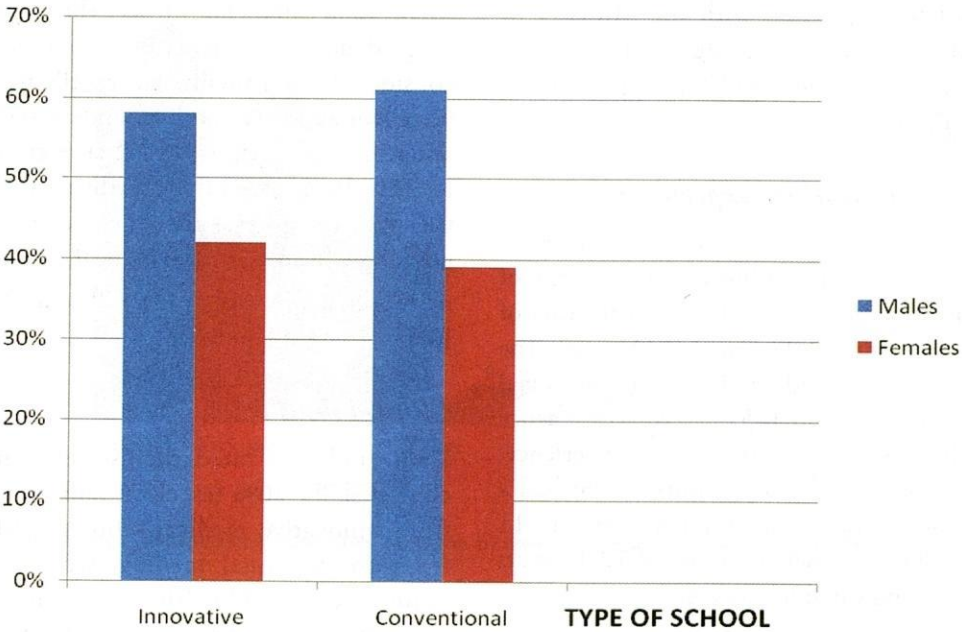


Fig 2: Distribution of Graduates by Type of Medical School

Type of health facility deployed

Of the facilities sampled, the majority of the respondents were found in Embu PGM, 17% were graduates and 19% supervisors as indicated in Table 3.

Although Embu Provincial Hospital seems to have a higher number of respondents, the findings indicate that the distribution of medical interns followed a criterion that ensured equitable deployment regardless of which medical school one was trained. This

Table 3: Distribution of Respondents by Health Facility

Serial No.	Health Facility	Graduates		Supervisors	
		No.	%	No.	%
	Nanyuki General Hospital	4	7	3	6
	Embu Provincial Hospital	9	17	9	19
	Nyeri Provincial General Hospital	5	9	4	9
	Machakos General Hospital	4	7	3	6
	New Nyanza Provincial Hospital	7	13	6	13
	Kericho General Hospital	3	6	3	6
	Kisii General Hospital	3	6	3	6
	Kakamega General Hospital	5	9	4	9
	Thika General Hospital	4	7	3	6
	Coast Provincial Hospital	6	11	6	13
	Port Reitz General Hospital	4	7	3	6
Total		54	100	47	100

seemed to augur well with the Ministry of Health strategy of ensuring no disparity in geographical distribution of its human resources for health in the country.

Supervisor's working experience

The working experience of supervisors is critical in providing objective assessment of graduates' competences. The average years of experience were 12.97 years (± 7.65 years). The minority of respondents in the study ranged from supervisors with 0-5 (4%) years experience and those with 30-35 (6%) years experience. The majority of the supervisors (57%) had a working experience ranging between 6 to 11 years followed closely by those of 12-17 years (17%) as indicated in Table 4.

Graduates perceptions of competences

The study set out to compare graduates of innovative medical school perception on the understanding of scientific foundation of medicine with those from conventional medical school.

Knowledge of scientific foundation of medicine

The understanding of scientific foundation of medicine is gained through knowledge of basic

sciences and clinical knowledge. The majority of the graduates from conventional medical school considered rated themselves excellent (82%) (excellent and very good) in understanding of scientific foundation of medicine compared to 77% from innovative medical school on the same category as shown in figure 5. The graduates from the two medical schools did not differ significantly [$\chi^2 = 1.20$, 1df, $P > 0.05$ {0.274}] on this competence.

Clinical skills

Both graduates rated themselves highly in clinical skills, 76% (excellent and very good) from innovative medical schools, and 79% from conventional medical school in the same category. The findings concur with thematic study findings from focus group discussions where some graduates from conventional medical school said *We doctors are grilled in the better part of our training in the handling of patients in hospitals and not spending lot of time in the community*. However, further analysis of this study showed that there was no significant difference

[$\chi^2 = 1.27$, 1df, $p > 0.05$ {0.259}] between graduates from the two schools as regards this competence (Figure 4).

Table 4: Distribution of Supervisors According to Working Experience

Supervisors	No.	%
Range of Experience		
30-35 years	3	6
24-29 years	3	6
18-23 years	4	9
12-17 years	8	17
6-11 years	27	57
0-5 years	2	4
Total	47	100

HEALTH

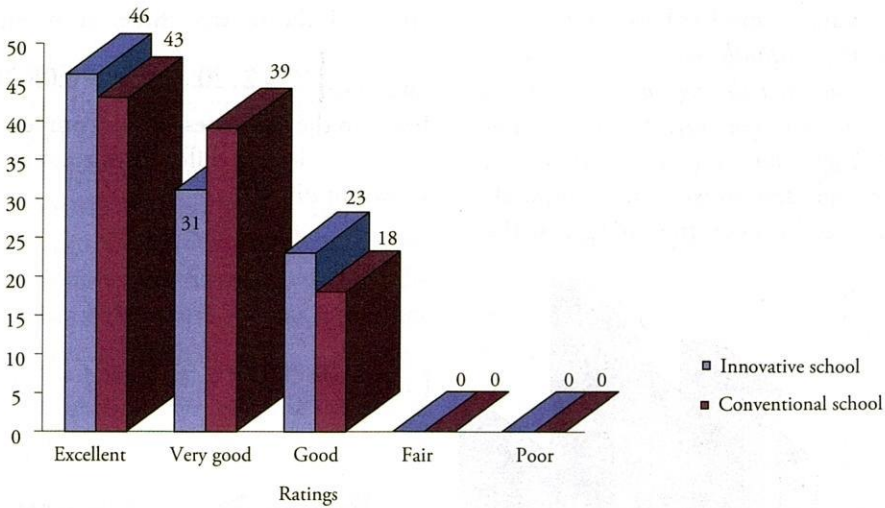


Figure 3: Percentage Distribution of Graduates' rating on Knowledge of Scientific Foundation of Medicine

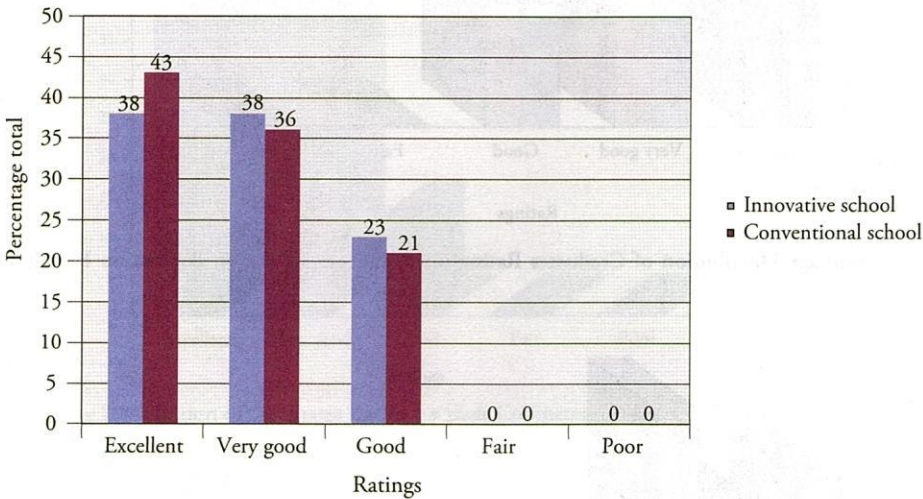


Figure 4: Percentage Distribution of Graduates' Rating on Clinical Skills Competence

Population Health and Health Systems

The majority of the respondents 85% (excellent and very good) from conventional medical schools regarded themselves as excellent in regards to the knowledge of population health and health systems than those from innovative medical school (69%) in this category. However, on further analysis of the findings, it was found that there was no significant difference

$\left[\chi^2 = 2.20, 1df, p > 0.05 \{0.138\} \right]$ between

the graduates of both schools in this competence as Figure 5 shows.

Communication Skills

The study findings indicate that graduates of innovative medical school rated themselves high on this competence (100%) (excellent and very good) compared to their counterparts in conventional medical schools (85%) in similar category. These findings are collaborated by focus group findings where some respondents

HEALTH

from innovative medical schools said, *'because we are constantly engaged in presenting information collected through our self-directed learning, we have become better communicators than our colleagues from the traditional medical school.'* Although descriptive analysis showed a slight difference between the ratings, further

analysis indicates that there was no significant difference [$\chi^2 = 2.20, 1df, p > 0.05 \{0.138\}$] between the graduates on this competence. The graduates do not differ in this competence as shown in Fig. 6.

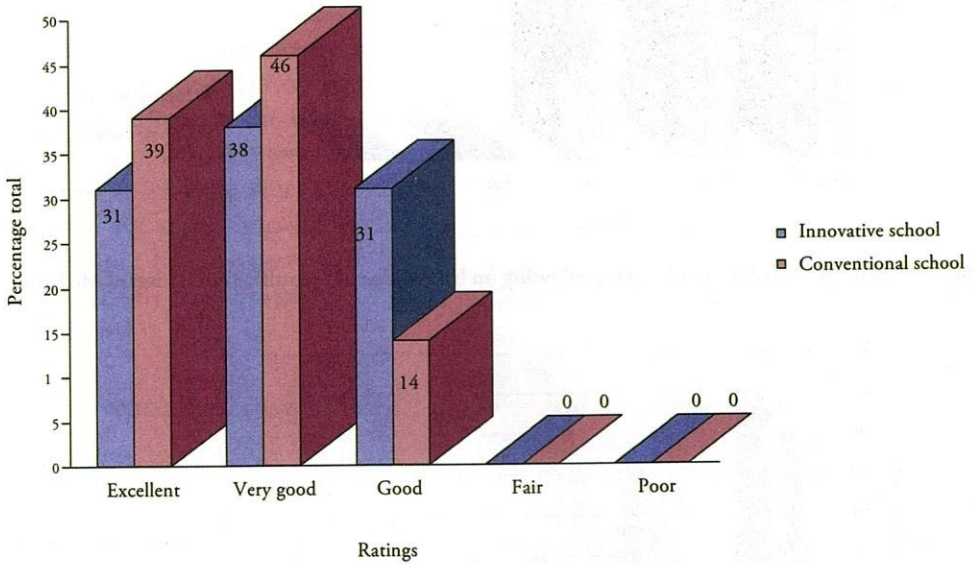


Figure 5: Percentage Distribution of Graduates Rating on their Competence on Population Health and Health Systems

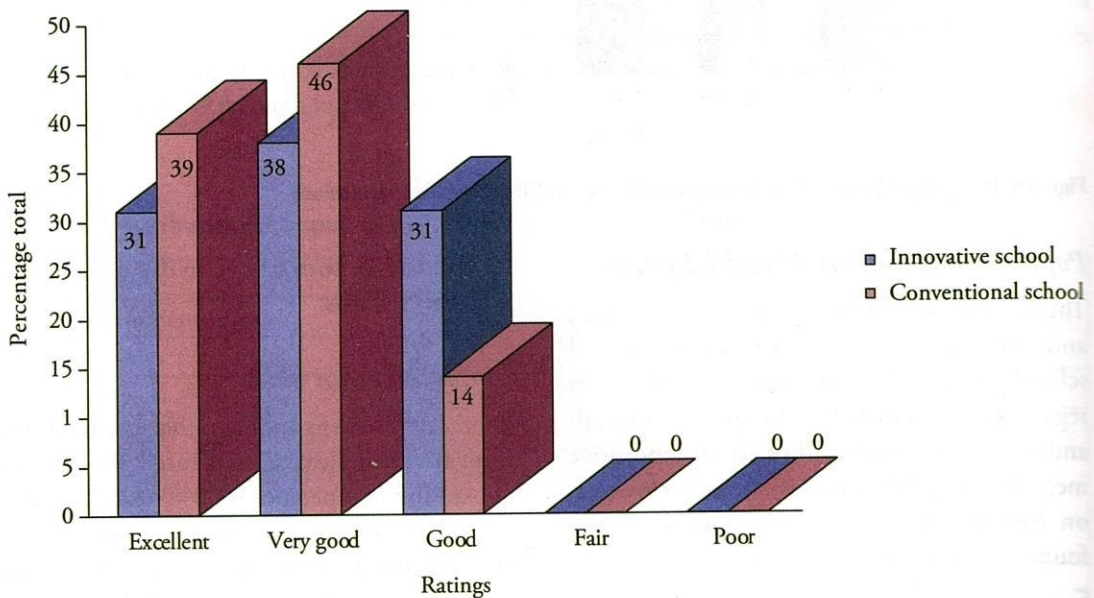


Figure 6: Percentage Distribution of Graduates Rating on their Competence on Communication Skills

Critical Thinking and Research

The respondents from conventional medical school rated themselves very high (100%) (excellent and very good) on critical thinking and research abilities much more than those from innovative medical school (88%) on a similar category. Although graduates rated themselves as indicated, further analysis of the findings indicate that there was no significant

difference [$\chi^2 = 1.58, 1df, p > 0.05 \{0.209\}$] between graduates of the medical schools as shown in Figure 7.

Management of Information Systems

The study shows a high rating from innovative medical school respondents (100%) compared to 64 % (excellent & very good) from conventional medical schools. These findings are supported by further analysis which indicates that there was significant difference $\chi^2 = 9.15, 1df, P < 0.02 \{0.005\}$ between graduates from the two medical schools. Fig 8 presents these findings.

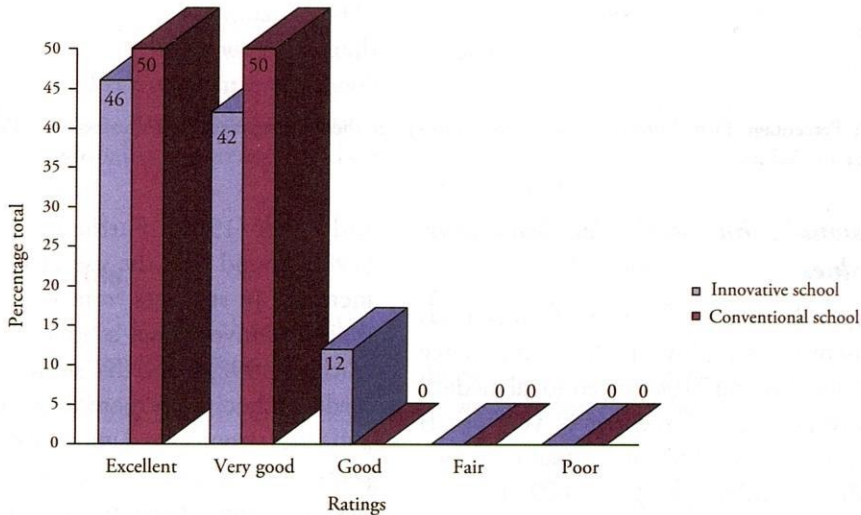


Figure 7: Percentage Distribution of Graduates Rating on their Competence on Critical Thinking and Research

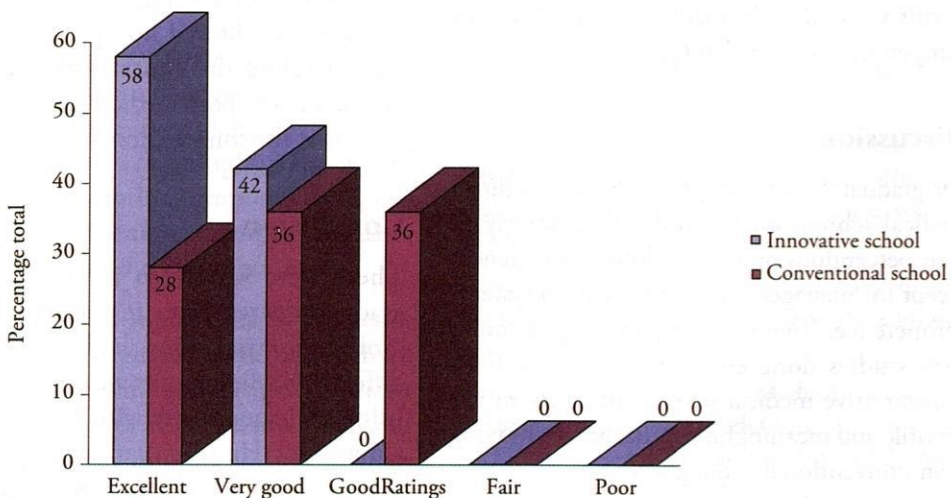


Figure 8: Percentage Distribution of Graduates Rating on their Competence on Management of Information Systems

HEALTH

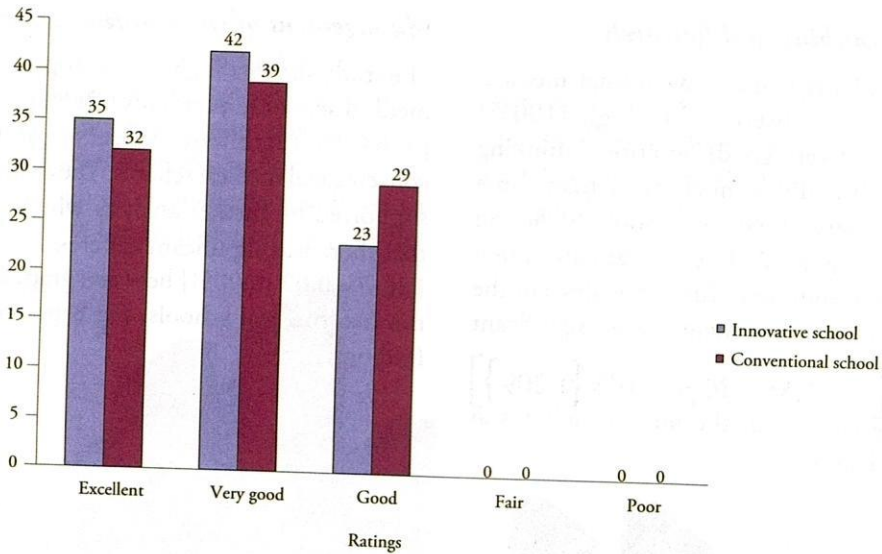


Figure 9: Percentage Distribution of Graduates Rating on their Competence on Professional Ethics, Attitudes, Behaviour and Values

Professional Ethics, Attitudes, Behaviour and Values

The respondents from both medical schools rated themselves highly on this competence (77% innovative and 71% conventional medical schools respectively) (excellent & very good) category. Further analysis shows that there was no significant difference [$\chi^2 = 0.02$, 1df, $P > 0.05$ {0.88}] between the graduates' rating on this competence. The proportion of graduates in this study does not differ in regard to this competence as shown in figure. 9.

Discussion

The graduates from innovative and conventional medical schools do not differ significantly in their perceptions on the six global competences except for management of information systems competence. These findings are in agreement with studies done elsewhere where students of innovative medical schools are likely to use versatile and meaningful approaches to studying than conventional school students, who were likely to reproduce notes given to them by their lecturers according to Coles (1985) and Newble

and Clark (1986). Furthermore, Nolte, *et al* (1988) found that the use of reserve material increased in students from innovative schools than in conventional schools. Blumberg and Michael (1992) found that students in innovative medical schools were more likely to use textbooks and other resources and informal discussions with peers than students from conventional schools, who were more likely to rely on lecture notes. However, the supervisors' ratings of graduates from both medical schools on all the seven global competences showed no significant difference and therefore the supervisors perceived the graduates from both medical schools competent in each of the competences.

Conclusion

There were variations in descriptive data; graduates' perceptions in the six of the seven global competences had no significant differences when results were further analyzed using Chi-square test with Yates' Correction Continuity. However, ratings of graduates on management of information systems showed significant differences. The conclusions deduced

HEALTH

from these findings were that innovative medical schools gave students the ability to evaluate information as they search for it thus making them better in this competence than their colleagues from conventional schools while graduates from both schools did not differ significantly on the other competences.

Supervisors' ratings of the graduates of the two schools did not differ significantly thus indicating that perceptions of supervisors on these graduates training were the same from both schools despite the difference in orientation of the two medical curricula. The study therefore showed that graduates of the innovative schools of medicine were generally comparable to those from conventional schools of medicine but had marked differences in only one of the seven global competences of their professional practice,

Recommendations

Based on the results of this study, the researchers made the following recommendations

1. Mechanisms should be put in place to ensure that students from conventional medical schools are exposed to different approaches of managing information, which are useful for decision making and practice in medicine.
2. Supervisors of graduates should observe intern doctors on a daily basis on how they performed on the seven global competences and rate them accordingly. This would minimize limitations imposed by a self administered questionnaire where graduates provide data on their perceptions.
3. The category of supervisors of graduates should also be extended to include all those supervisors providing oversight of intern medical doctors in a district, provincial and tertiary hospitals in order to have a larger population of respondents
4. A standardized tool for comparing graduates of innovative and conventional schools should be developed for assessing the seven global competences
5. Comparative studies on the outcomes of innovative medical schools should be conducted to establish the real gains of re-orientating medical education approaches.
6. The Ministry of Health need to initiate tracer studies that facilitate mapping of medical school graduates in the country. The studies should categorize graduates according to their training institution. This would make comparative studies on competences and other aspects of graduates' performance much easier.

References

- Barzansky B. & Gevitz N. (1992) Innovations in medical education: Beyond Flexner: *Medical Education in the Twentieth Century*. Greenwood Press, USA.
- Boelen C. (2001) *Accreditation and development of medical schools: A global project towards unity for health*, October, 6-9.
- Brown G., Bull J. & Pendelbury M. (1997) *Assessing student learning in higher education*. London. Routledge.
- Christakis N.A. (1995) "The similarity and frequency of proposals to reform US Medical education. Constant concern." *Journal of the American Medical Association*, vol. 274, 706-711.
- Cooke M., Irby D., Sullian W., & Ludmere K.M, (2006). "American medical education : 100 years after Flexner report." *Medical Education*, vol 335, 1339-1340.
- Dewel J. (1993) "How we think: A restatement of the relation of reflective thinking to the education process." *Health*, Boston.
- Garcia-Barbero M. (1995) "Medical education in the light of the World Health Organization: Health for All strategy and the European Union." *Journal of Medical Education*, vol. 29, 3-12.

HEALTH

- Gay R.L (1992) *Competencies for analysis and application*. Education Research. Columbus. Charles E. and Merrill Publishing Company.
- Harden R.M., Crosby J., Davis M.H., Howie P.M. & Struthers A.D. (2000) "Task-based Learning: The answer to integration and problem-based learning in the clinical years." *Medical Education*, vol. 34, 391-397.
- Maudsley G. (2001). What issues are raised by evaluating a problem based undergraduate medical curricula? Making healthy connections across the literature. *Journal of Evaluation in Clinical Practice*, vol.7, (3), 311-324.
- Moi University, Faculty of Health Sciences (2004). MB.CH.B *Curriculum Review: Final Report*. September 14 (Unpublished).
- National Health Sector Strategic Plan II* (2005-2010). Ministry of Health, Kenya.
- Newble, D., I & Clarke, R.M. (1986). "The Approaches to learning of students in a traditional and in an innovative problem-based medical school." *Medical Education*, 20 (4):267-273
- Schmidt H.G. *et al* (2006) "Long-term effects of problem-based learning: A comparison of competencies acquired by graduates of a problem-based and a conventional medical school." *Medical Education*, Vol.40, 562-567.
- Schmidt, M.R., Wojczak, A (2002) "Global minimum essential requirements: A road towards competence-oriented medical education." *Medical Teacher*, 24 (2): 125-129.
- Slavin R.E. (1984) *Research methods in education. A practical guide* Washington: Englewood Cliff. N.J. Prentice Hall.
- Subramaniam R.M., Scally P. & Gibson R. (2004) "Problem-based learning and medical student radiology teaching." *Australasian Radiology*, Vol. 48, 335-338.
- WFME/WHO (2003). *Basic medical education global standards for quality improvement*. World Federation for Medical Education and World Health Organization.