Original Article

Implementation of an education development project in pathology to improve student competency-lessons learnt

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Abstract

Context: Basic medical sciences and clinical teachings are not coordinated in the present medical education system. They are not taught keeping in mind the outcomes required at the time of actual handling of patients in the community. **Aims:** An educational development project was implemented in the Department of Pathology with the aim that it will result in the student learning to link the pathophysiology of the disease to clinical scenarios and become fully competent for lifelong medical practice. **Subjects and Methods:** The pathology teaching of the second professional batch was modified by starting with defining the desired outcomes/competencies in the student's knowledge, skills, and attitude which were then addressed by lectures, demonstrations, practical classes and small group activities where case scenarios and laboratory reports were included. The outcome was assessed by Objectively Structured Clinical/Practical Examination and multiple choice questions. Force field analysis, faculty and student interviews, and questionnaires were used to assess the factors affecting its implementation and impact. **Results:** Totally 80 students of the 2nd Professional MBBS were exposed to a competency-based education development project. It was found that the system was appreciated by faculty and students, especially the integration with clinical scenarios. There were many factors which influenced the execution of this program, including motivation level of students and faculty, time, logistics and meticulous planning. **Conclusions:** There was a significant improvement in student's performance and satisfaction. Many factors including prior planning were a major determinant for the success of this education development project.

Key words: Competency, education development project, outcome

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Introduction

There is a need to establish the desired outcomes/competencies across the medical education curriculum to achieve high educational standards. The subjects are taught in the traditional subject-oriented approach. The desired outcome is usually not defined at the time of teaching of basic sciences and preclinical subjects in the second professional. Instead these subjects are taught with the objectives of teaching only the basics without special regard to whether students are competent enough to be able to implement these basic sciences at the time of actual handling of real life patients. Competency-based education has been recognized by educationists worldwide and it includes more than the possession of knowledge, skills, and attitudes and it

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focuses on the application of these abilities in the real patient scenario to achieve the desirable standard in management of various diseases. It includes designing, implementation, assessment, and evaluation of a medical education program using an organizing framework of abilities or competencies. Accreditation Council for Graduate Medical Education has defined general competencies as: Medical knowledge, patient care and procedural skills, interpersonal and communication skills, practice-based learning and improvement, systems-based practice and professionalism.[1,2]

Competency-based education begins with a careful consideration of the competencies desired in the health professional workforce to address health care priorities, it provides a vehicle for integrating the health needs of the country with the values of the profession.[3,4]

Another term that has been described in the context is the entrustable professional activity (EPA) which reflects the competencies expected that are a part of essential work for a qualified professional and is observable and measurable, leading to a conclusion. The concept "EPAs" connects the competence frameworks with the clinical practice.[4,5]

It is also very important to ensure that the trainee has demonstrated the required competence and is ready to progress further in a career. This mandates the need for robust systems for assessment and evaluation to demonstrate that the trainee possesses the required capability to work satisfactorily in the clinical environment. Accordingly this study was planned to implement a comprehensive module addressing desired competencies and their evaluation.

Subjects and Methods

The education development project was executed for the MBBS 2nd professional students of the Himalayan Institute of Medical Sciences. A total of 80 students of the 2nd professional MBBS were exposed to the innovation in various sessions including lectures, demonstrations, practicals, and in small group activities. Ten faculty members and 15 residents were involved.

A need assessment questionnaire was prepared, validated from senior faculty members and administered to all faculty members of Pathology Department. All faculty members were sensitized to the details of the project planned. Permission was taken from the research committee, ethics committee and head of the department to conduct this project. The "must know areas" were discussed, before designing the module and finalized in consultation with senior Faculty of Pathology and Clinical Departments. The modified teaching modules were prepared including various case scenarios, lab reports, and activities. Assessment module was designed, including multiple choice questions and Objectively Structured Practical Examination. Interview questionnaires were planned for the faculty and residents for evaluation of the intervention. Student information sheets and informed consent forms were prepared. Feedback questionnaires for students and faculty were designed and modified after pretesting with colleagues.

The faculty members of Department of Pathology were sensitized to the new project for enhancing pathology teaching, its assessment and possible advantages to students. At the end, they were apprised with the results of this study and their experiences were shared. The student feedback was also shared with them. The discussion was held on the utility of the system.

All students were exposed to regular teaching sessions, including lectures on various topics. Following this they were exposed to the predesigned teaching modules in demonstrations, practical classes, and small group activities. Assessment was performed at the beginning and end of the new teaching modules. Faculty members were interviewed at the end of the system. Students were administered feedback questionnaires. Data were recorded and analyzed. Analysis was done using descriptive statistics and qualitative methods. Data were analyzed using statistical software IBM SPSS version 22 Customer No. 10063950; Customer ID: 224134 by International Business Machines Corporation, New York. Independent *t*-test was used to compare the mean of pre- and post-innovation scores of students. Faculty impressions regarding the achievement of desired competency were represented in the form of frequency and percentage.

Results

The mean pretest score of students was found to be 5.61 ± 1.52. After the intervention of competency-based education sessions, it was found that the mean of posttest score increased by 1.48. This difference was statistically significant ($P = 0.0001$) at 5% level of significance. Faculty were interviewed and a force field analysis was performed at the end of the system [Table 1]. The faculty member appreciated the system and commented that the system should be implemented in other subjects also and will help in PG entrance too.

The students were given feedback questionnaire that asked them to specify the changes they felt had happened after the new system was implemented. All students reported that they felt confident and competent to perform the task given viz. laboratory report interpretation, making a diagnosis, etc. All students rated the new system as better in comparison to

Table 1: Force field analysis among faculty regarding implementation of competency-based education

Factors in favor	Factors against
Linking theory to practical sessions	Tedious process in preparation of modules and planning
Linking with clinical scenarios	Time consuming
Lab result interpretation	Not exam oriented
Help from residents	Student motivation low
Use of OSPE	Attention to individual student not possible
	Student attitude

OSPE: Objectively Structured Practical Examination

Table 2: Student open ended comments regarding implementation of the competency-based system

Student's comments
We feel more comfortable and more confident
The system helped to enhance our clinical knowledge
Telling about clinical cases helped to understand and visualize the disease process
It helped in interpreting the disease better
It gave us space for mind work
Sometimes when groups were very big it was difficult to understand

the traditional method. They reported enabling factors to be: Case studies, pictures, laboratory reports, group work and interactive sessions. The hindering factors reported were: Time consuming process, big groups sometimes [Table 2].

Discussion

Designing a curriculum-based on competencies ensures the student's learning in all aspects that is, knowledge, skills and attitudes and their implementation. The assessment module design is also a very important aspect. Oandasan *et al*. have linked the curriculum design with assessment and reported that both these processes are interdependent features of a Triple C competency-based curriculum.[1] It is a little similar to objective-based education, but this approach begins with an agreed-upon set of competencies (combinations of knowledge, skills, and attitudes) that are required to complete a program of learning.[2] The concept of "competence" and "competencies" have been described by Gruppen *et al*. who believe that it has even more potential to align educational programs with health system priorities in more resource-limited settings as it begins with a careful consideration of the competencies desired in the health professional.[3] There is a real need in the current scenario for this system to be implemented and studies have been done regarding the reason for inclination towards this system.[4] The concept "EPAs" has been utilized to connect the competence frameworks with the clinical practice and to facilitate the application of this approach.[4,5] The improvement in student performance is obvious when compared with the traditional system and has been described in the literature.[6]

In our study, it was found that a number of factors affect the implementation of this system. Such facilitating and hindering factors have been discussed by Jippes *et al*. recommend designing the curriculum with the needs of the users in mind.[7] The second important aspect of the design is the assessment system. It is reported that a competency-based examination blueprint for standardized patient clinical skill examinations can improve examination validity, facilitate alignment with competencies and milestones, enable progressive clinical skills assessments, and allow for targeted feedback.[8]

In this study, the students of the 2nd professional MBBS course were exposed to additional teaching modules based on outcomes and they showed a significant improvement in scores as compared to traditional teaching. The faculty reported achievement of desired competencies. Force field analysis revealed factors that affected the implementation of this system in the department. Student feedback was performed at the end of the sessions and they reported a high level of confidence in the desired competencies and that they had benefitted from the system in terms of good correlation of disease morphology and pathogenesis with clinical presentation and organization of thought process. The faculty members and residents involved in teaching appreciated the system and expressed the desire to implement in other systems and subsequent batches too as it may contribute to more effective learning.

Apart from improvement of student scores and satisfaction, the implementation of various activities had impact on teaching sessions, and on the department as a whole as: All lectures, practicals, slide and gross demonstrations were aligned to happen at the same time for any topic in order to work on a particular competency comprehensively; laboratory report interpretations was introduced for the first time; faculty members started talking of must-knows, objectives, competencies, and interactive teaching methods.

Conclusions

In this study, the teaching of pathology was aligned around predecided outcomes, and it was found that the system was appreciated by faculty and students specially the integration with clinical scenarios. The study concluded that teaching systems need to be modified and re-planned based on the felt needs. Implementation of a system based on outcomes is useful but dependent on logistics, time required and faculty commitment and requires meticulous planning.

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Conflicts of interest

There are no conflicts of interest.

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