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Case Report

University-Wide Implementation of Problem-Based Learning

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Abstract

Problem-based learning (PBL) is a few decades-old innovative educational strategy that is spreading throughout the academic world. The Libyan International Medical University decided to adopt this strategy and to change from its traditional system shortly after its establishment in the year 2007. This case study aimed to outline the reasons for considering the change, the obstacles, and the strategies adopted throughout the university to effect the change at the student, faculty, curriculum, physical environment, and organization levels and also to compare this experience with that of other universities. significant implementation of PBL was accomplished using a combination of three types of change strategies: rational, normative re-educative, and coercive. It was also shown that this experience of implementation of PBL is quite similar to that of other universities and colleges. It was concluded from this case study that a combination of change strategies was productive in bringing up the change, and that the strategies adopted as well as the obstacles faced are similar to those reported by other universities.

Keywords: Change management, Libyan International Medical University, problem-based learning, problem-based learning curriculum, problem-based learning

Introduction

Teaching is defined as a purposeful activity that transfers knowledge and/or skills to the learners.[1] Others define teaching as the creation of teaching situations in which learning can effectively occur.[2]

Lecturing is a direct method of teaching in which the lecturer acts as the main source of knowledge and explains to the students the content and concepts included in his/her presentation. However, lectures were largely debated for their questionable effectiveness in higher education for a number of reasons. These include the rigid nature and the passive role of students who act as a "knowledge-receiving end" with minimal interaction or assimilation of the knowledge and concepts into their mental constructs. Even though teachers can provide well-structured lectures and involve students in questioning, it is clear that lecturing does not conform to the best way adults respond to teaching. Adult learners generally learn better when teaching situations are constructed for them in such a way that they mimic real-life contexts. They are more goal directed, autonomous, and practical in their approaches to learning. For these reasons, problem-based learning (PBL) is well suited for adult learners. PBL was basically developed to augment clinical reasoning of students of medical schools.[3] PBL is an innovative instructional strategy which uses problems as a trigger for learning. In PBL, students are challenged with problems to solve them and while trying to solve them, they realize the need to search for resources in order to get the necessary knowledge/skills required for understanding/solving the trigger problems. During this endeavor, students use and learn skills such as teamwork, interpersonal communication, metacognitive powers, and good reasoning in addition to knowledge and the skills of self-directed life-long learning. PBL at medical schools focuses on patients and their clinical presentation as well as on community problems and study them in an integrated holistic as well as critical approach.[4]

Learning is a complex process that necessitates the integration of multiple operating factors for it to end in a positive outcome. The teacher used to be at the center of the process acting as the main source of knowledge, skills, and attitudes. Due to the dramatic expansion of the size of the knowledge, it became

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apparent that the human brain is incapable of following the almost instantaneous change in knowledge. In addition, the attributes required to be casted on the current and futures graduates are different from those which characterized the older generations. The needs and the demands of the highly developing nowadays industries as well as the rapid cultural, economic, technical, and conceptual changes that drive human societies call for a change in the products of the educational processes at undergraduate and postgraduate levels. For these reasons, a shift of the paradigm of the process of education was a mandatory move. This shift required a change of the concepts of learning and teaching as well as roles of the learner, the teacher, the trainer, and the way the curriculum is designed and implemented. The focus has moved from instilling huge amounts of information into the students' heads to the processes that the students need to mine, analyze, interpret, and apply the learned information. This shift requires immense efforts to change the way teaching staff, students, and other stakeholders understand the process of education. Changing a well-established century-long traditional method of instructions requires a repertoire of patience, planning, implementation, evaluation and re-engineering of the curricula, methods of instructions, staff performance, and even some physical changes in the educational environment.

Seeds of the transformation

Health professional education in Libyan health professional schools (HPS) witnessed a downward trend in the quality of its graduates over the last two decades due to a number of reasons. These included the huge number of students directed by the government to the schools; the low educational level of the university entrants due to unplanned changes in secondary schools' educational processes and curricula; lack of stringent selection criteria; poor resources; intrusion of political pressures on the way schools are handling the educational processes; lack of autonomy of higher education institutions (HEI); lack of clear vision, mission, and planning; and the insufficient implementation of the quality standards. There was also marked expansion in the number of HPS with satellite branches throughout the country. These were endowed only with scarce human and physical resources. A group of 23 highly motivated faculty members at the medical school of Garyounis University (currently named Benghazi University) at the city of Benghazi, Libya, started a series of activities in the year 2003 at the Faculty of Medicine (FOM) aiming for inducing and sustaining changes in the educational situation prevalent at that time. This work was initiated and led by the dean of the Medical school. This work lasted for about 3 years where a good library, a clinical skills laboratory, and a medical education unit with branches at affiliated educational hospitals were established. Unfortunately, the intrusion of politics and the change in the leadership brought all these changes to a halt and all achievements gone in no vain.

Journey of change

The Libyan International Medical University (LIMU) was established in the year 2007 as the first private university focusing mainly on health professional studies. It was established by the same 23 medical teachers who shared a vision. Its start was in direct response to the failure of accomplishing the objectives of the 23 staff members mentioned above. This group of motivated medical teachers held a series of meetings in the year 2007 and decided to lead the endeavor of establishing the LIMU. A suitable campus was already in place, and this enabled the group to launch the project in October of the same year.

The LIMU initially included the following schools: Basic Medical Sciences (BMS), FOM, Faculty of Pharmacy, Faculty of Dentistry, and Faculty of Health Sciences. The latter was meant to teach nursing and other health-allied sciences, but it did not receive a single student for a number of reasons. The reasons were mainly the inferiority perspectives through which the local society is looking at the job of nursing and the low nursing job income in the country. An information technology (IT) faculty was added in 2010 with health informatics as its first program. Two more programs were added later, i.e., software engineering and networking. The faculty of business administration was established in 2017 and now has five operating programs.

At the beginning, the curriculum used was a traditional one similar to that implemented in the public medical schools. However, it was completely realized that the old curricula and the traditional instructional methods fall too short of the aims of having highly qualified medical graduates in spite of trying to infuse them with interactive lectures and some PBL sessions. The LIMU was aiming from its start to adopt new learning strategies, and this required 2 years of preparation and piloting in the years 2007 and 2008. Therefore, the university's higher management and LIMU council decided on making the change with the aim of adopting, modifying, and implementing PBL as the primary learning strategy, which likely end up having competent graduates as well as enhancing the LIMU's organizational capacity. Enhancement of the organizational capacity is a long-lasting effect on the organization because graduates leave the school, but the structural changes in the organization in terms of facts, values, regulations, and staff competences are lasting.[5] In order to bring up this change, a series of actions guided by strong visionary leadership of the university with full participation of the LIMU council and faculty were planned and implemented. These actions included the creation of a taskforce for planning, implementing, and monitoring the change processes. Changing a reality requires addressing the following four elements: the existing situation (facts), the logic of the reality, the values underlying and driving the real situation, and the communication with the surrounding environment.[6] Members of the taskforce were selected on the basis of their intrinsic motivation, agility, and belief in the importance of creating a model of excellence in medical education in Libya with the hope that other schools will follow this model. Actions taken included:

1. Assessment of the need for change
2. Rewriting of the mission and vision of LIMU

3. Issuing newer regulations to help implement the changes
4. Performing multiple meetings/seminars inside and outside the country for staff members. These activities focused on enhancing faculty motivation, their expectation of success, and the utility value of their work[7]
5. Introducing the PBL strategy of instruction and assessment to students
6. Recruiting and training of tutors/facilitators
7. Joining master degree program on health professional education by some taskforce members
8. Implementing courses/workshops on interactive teaching, objective writing, peer review, problem formulation, tutoring, group dynamics, running PBL sessions, individual and group assessments, as well as conflict management
9. Leading a promotional campaign among stakeholders to raise awareness of the importance of the change among parents and community members
10. Active participation in the National Quality Assurance Agency for Higher Education Institutions with the aim of introducing the new concepts to the accreditation standards
11. Providing the resources needed for the change. These included monetary as well as physical materials such as clinical skills labs
12. Using Moodle as a virtual learning environment.
13. Delivering plenary lectures and workshops on PBL and interactive teaching and learning to staff members in public universities with the aim of reducing the resistance to change in the surrounding macro-environment
14. Establishing curriculum development committees which held regular meetings for the gradual development of curricula year by year
15. Conducting 360° evaluation of the PBL-based programs by staff members, students, and other stakeholders
16. Relying on younger staff members to bring up the change
17. Introducing PBL sessions on a gradual basis for the purpose of training and to get teachers more confident in their abilities and allay their anxiety about this new experience
18. Using different models of PBL in different faculties. It was particularly hard to implement highly integrated PBL curricula in the faculties of IT and business administration. These two faculties are basically not directly related to health sciences and their staff members come from a different background. The only option available was to start pilot PBL sessions and finally we reached to achieve horizontal integration between some courses running in the same semester. Their teaching continues of the hybrid PBL type where PBL and non-PBL strategies are going hand in hand
19. Publishing reading hard and soft materials on PBL.

The Pharm-D program, which initially started using PBL as its main method of instruction, has experimented and then adopted team-based learning in addition to PBL.

Obstacles

This process of change was by all means a hard task to do. Difficulties faced were mainly the resistance to change by staff members. Arguments against the change included doubts about its effectiveness, the notion of the possibility of ending up with graduates having poor knowledge base, difficulties of assessment, the larger administrative and scheduling work, the reluctance of accepting the active participation of students in the assessment process, the large work effort needed for implementation, and the possible high cost. The reluctance was more commonly encountered among the senior staff members. Another reason was that the taskforce was not having the answers of all questions raised by the opponents due to the only recent involvement of its members in the PBL process. Students' and parents' anxiety was also an issue, and some were thinking that students are left to study on their own with no guide. Other obstacles included crowded curriculum, marginalization of teaching of soft skills, lack of governmental legislations that accommodate the change, belief of nonrelevance of PBL to certain courses, and technical problems. New entrant students with insufficient English mastery contributed to the resistance because PBL requires self-dependence and plenty of self-directed search and reading. However, most of these new entrants and their families gradually realized the benefits and got adopted to PBL strategy with marked improvement in their English. A small number of students continued to be stubbornly reluctant to change and chose to quit and join traditional medical schools, where they will get ready-made information and the assessments are largely dependent on recall of factual knowledge.

Discussion

This article describes how the LIMU shifted from a traditional approach of teaching to a student-centered one, i.e., PBL. It was found that the obstacles faced by LIMU as well as the processes used to make the change are largely similar to others' experiences.[8-10]

Unlike some other HPS, the PBL curricula at LIMU were totally developed by the staff of LIMU through a process of customization and transformation of the objectives of the traditional curricula from different resources, an observation reported by Albuali and Khan in a report from Saudi Arabia.[11]

The customization process was infused with subjects not usually emphasized in the developing world schools such as ethics and interpersonal communication. This approach was hard to implement but ended in good development of the university capacity with resultant accumulation by now of an almost decade-long experience.

The process of implementing the change was probably facilitated at LIMU by the short time interval between the start of the university and the decision to make the change. This short span probably prevented the consolidation of old, outdated traditional educational culture. Therefore, staff members came to LIMU knowing from early on that a change

is in progress and have to participate in it. However, all the staff members were graduates of a traditional educational system and for few of them, the change is an impossible mission.

Based on human nature, Chin and Benne classified the strategies of producing change in an organization into three types:[12]

1. Rational strategy which depends on the implicit fact of the rational thinking of human beings. Once the need for change and its advantages to the organization are explained to the members of the organization, most of them will positively respond to the change because it makes sense to them
2. Normative re-educative strategy: This strategy utilizes the social behavior of humans and their tendency to learn new behaviors and values. Such kind of change is long lasting and it is important for lasting capacity building
3. Power coercive strategy: This strategy relies on top-down approach because most men identify only with their personal gains and these not necessarily align with those of the organization. This is particularly true when the change brings with it more workloads on members of the organization. In the situation of introducing curricular changes such as PBL that need more work on the part of staff members, resistance might be expected.

In the case of LIMU, the three strategies were simultaneously applied by the leadership and LIMU council. Not all faculties at LIMU had the same pace of transformation where IT faculty joined later than others. On the other hand, the program of business administration and that of PharmD were started with the adoption of PBL from their beginning. This is because these two were established later than other programs when PBL culture was already established at LIMU. Reasons laid by staff members of the late transforming programs to were mainly the lack of confidence in succeeding in making the change, lack of enough full-time staff members, and lack of time because of overcommitment. These reasons were also operating in other faculties such as the faculty of BMS which were at the front of the change, but they managed to implement the change because they were chosen as the model for the rest of the programs. The application of each of the three change strategies varied by faculty and stage of implementation. What we noticed in our experience of introducing and implementing PBL at LIMU is not quite different from that reported by others, indicating a common educational change pattern.[8-10]

This case study stresses the notion that induction of change of an educational organization pivots on change in the curriculum and the educational environment because major changes in curriculum invoke changes in the methods of instruction, different resources, and different ways of communication between students and instructors. At the same time, changing the strategy of learning entails making changes in curricula. Such a bidirectional relationship between curricular and organizational changes was also emphasized by others Chrusciel.[13,14]

This article did not discuss the impact of the change on students' outcome and employability rates, which would be the focus of another article.

We conclude from this experience that the simultaneous application of different strategies of change has led to successful outcome and that the obstacles and steps taken to overcome them are similar between HEIs. This case study represents an example of the central importance of strong leadership in bringing up change in HEIs.

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Conflicts of interest

Both authors are part of the higher administration.

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ملخص المقال باللغة العربية

التطبيق الجامع للتعلم القائم على حل المعضلات

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التعلم القائم على حل المعضلات (PBL) هو استراتيجية تعليمية مبتكرة بدأت في الانتشار في جميع أنحاء العالم الأكاديمي منذ عقود. قررت الجامعة الليبية الدولية للعلوم الطبية اعتماد هذه الاستراتيجية والتغيير في نظامها التدريسي التقليدي بعد فترة وجيزة من إنشائها في عام 2007م. تهدف هذه الدراسة (تقرير الحالة) إلى تحديد أسباب النظر في التغيير، والاستراتيجيات التي اعتمدت في الجامعة من أجل إحداث التغيير وعقباتها، وذلك على مستوى الطلاب وأعضاء هيئة التدريس والمناهج والبيئة المادية ومستوى التنظيم. كما هدفت هذه الدراسة إلى مقارنة هذه التجربة مع تلك التي تمت بالجامعات الأخرى في بعض دول العالم. تم تنفيذ التعلم القائم على حل المعضلات بشكل كبير باستخدام مزيج من ثلاثة أنواع من استراتيجيات التغيير: العقلاني، والتعليم المعياري المعاد، وكذلك القسري. وقد تبين من هذه الدراسة أن تجربة تنفيذ التعلم القائم على حل المعضلات مشابهة لتجربة الجامعات والكليات الأخرى. وقد استنتج من تقرير الحالة هذه أن التوليفة من استراتيجيات التغيير التي استعملت كانت مثمرة في إحداث التغيير، وأن الاستراتيجيات المعتمدة والعقبات المواجهة مشابهة لتلك التي أبلغت عنها جامعات أخرى في بعض دول العالم.

الكلمات المفتاحية: إدارة التغيير، الجامعة الليبية الدولية للعلوم الطبية، التعلم القائم على حل المعضلات، منهج التعلم القائم على حل المعضلات.