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# Credit Hours Policy & Hybrid Problem-Based Learning (PBL) Curriculum Reform: An Experience of Najran School of Medicine KSA

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### Abstract

**Objectives:** In this article, the authors describe the practice of Najran school of medicine of adopting a new credit hours policy and evaluate the impact of this change on fixing problems of credit hours calculation for PBL courses. **Method:** The approach, we followed, was content analysis of the literature concerning what is written about credit hours of the different learning activity. We set a new credit hours policy where every learning activity was evaluated, defined & the equivalent workload & credit were assigned. The new policy was applied to 11 courses of the integrated PBL curriculum of Najran medical school & a report for curriculum reform was created. **Results:** We found that the application of the new policy can help to reduce lectures & gives chance for increase of student-centered learning activities on further curriculum revisions. **Conclusion:** The application of this policy was suitable for adjustment of the credit hours of our Hybrid PBL Curriculum for the purpose of academic accreditation. It can also give flexibility to the process of curriculum reform that is highly relevant to PBL philosophy.

## 1. Introduction

Problem-based learning (PBL) is gradually more being approved in the curricula of many medical schools as a strategy to foster and promote self-directed learning, the acquirement of critical thinking and teamwork skills <sup>(1)</sup>. With the introduction of the problem - based learning (PBL) into most Medical institutions, the number of lectures significantly reduced while novel teaching modalities are adopted. The majority, however, have introduced integrated lectures to address the needs of a PBL structure <sup>(2)</sup>.

Several medical schools in KSA started to shift toward implementing the PBL approach. The system of credit hours calculation used in KSA is similar to that used in USA <sup>(3)</sup> while that used by European universities like Maastricht or Dundee is quite different. European universities use the European Credit Transfer System (ECTS) for

calculation of credit hours where the unit used is (ECTS) unit that is different from semester credit hour (SCH) applied in KSA, which is derived from the American system<sup>(3)</sup>. The practice of credit hours definition in KSA is limited for defining credit hours for traditional learning activities as lectures, tutorial & practical classes which is not suitable to PBL of variant learning activities. While, most of the American universities depend on, institutional credit hour policy to adjust their course credit hours and student workload. Although all of the Regional Agencies demand teaching-learning activities to be measured in credits<sup>(4)</sup>.

Most Regional Accreditation Standards recommend that credit measurement should be left to institutions and faculties to determine the appropriate basis for awarding the credit unit. The North Central Association Schools and Colleges and Higher Learning Commission expects a joined institution to be able to equate its learning activities with semester or quarter credit hours using methods accepted to schools of higher education. This method is to justify the length of its programs in contrast to similar programs found in accredited institutions of higher education<sup>(4, 5, 6)</sup>. The concept of institutional credit hours policy is not known to commonly used in most of the Saudi medical schools.

Curriculum reform is quite essential for improvement of the educational process<sup>(7)</sup>. Application of PBL from country to other showed several variations that ranged from pure PBL up to just use of PBL teaching as a supplement to the traditional curriculum. Most Asian countries, which implemented PBL curriculum achieved a hybrid curriculum incorporating PBL as a necessary component of their new medical curriculum. They intended to shift from a learner-centered, lecture-based, discipline-oriented curriculum to a more student-centered, curriculum<sup>(8)</sup>.

One of the dilemmas of building a PBL curriculum is the establishment of a credit system that is suitable for the motivation of self-dependant learning. In this study, we describe the practice of Najran school of medicine of adopting credit hours policy and evaluate if this change can fix problems of credit hours calculation for PBL courses or not.

## 2. Methodology

This study is conducted at Najran school of medicine between February 2013 and May 2014 as part of the curriculum review committee task. This committee is one of the various bodies of the medical education committee responsible for the curriculum development.

This work is a qualitative descriptive case study with the primary focus of scrutinizing the adopted credit hour policy in different academic settings. In which an in-depth review of the literature was done. The central task of which is to keep in synchrony the amount of academic load of the curriculum with number of credit hours. We reviewed most educational settings particularly the American Universities. Where they use the institutional credit hour policy to adjust course credit hours and student workload. The principal concern was to adopt a policy of credit hour system that suits our socio-academic setting. Because our primary concern was to move towards a real PBL system that motivate the students to self-directed learners with lifelong problem-solving skills.

### 2.1. The Hybrid PBL Medical Curriculum in Najran College of Medicine

In Najran College of Medicine, we adopted a Program of Bachelor of Medicine and Surgery based on integrated hybrid PBL curriculum. The first batch joined in 2008, and they started the internship period mid of 2014. The curriculum is composed of three main phases namely the basic phase (consists of the introduction to basic medical sciences), preclinical and clinical phases.

The Hybrid PBL curriculum introduced into the preclinical phase, which is composed of 11 blocks in two years, mostly in the third and fourth years. The length of each PBL block varies from four to seven credit hours. Each block consists of lectures in the basic and clinical sciences, clinical skills, and PBL tutorials. The Course components for the Respiratory block showed in Table 2 as an example.

**Table (1).** Course components of the Respiratory block -Course credit hours 4(3+1)

	Basic science CH (Anatomy, physiology, biochemistry, microbiology, pathology & pharmacology)	Clinical science CH (Pediatrics, medicine & surgery)
Lectures	29	
Seminar	3	3
Laboratory	20	
PBL Sessions	16	
Tutorial		6
Skill Lab.		3
Directed Independent Study (DIS)	13	3
BST		6
<b>TOTAL course CH</b>	<b>102</b>	

## 2.2. Plan for Curriculum Reform

The need for Curriculum Reform raised near the end of the implementation of a complete cycle of the primary curriculum due to several reasons. On one hand, we found that we are in need to move further toward PBL strategy by increasing the student-centered learning activities at the expense of traditional teacher-based activities. This plan aimed to support our goal that focuses on encouraging self-directed learning and independent study. On the other hand, we expected to overcome some of the common curriculum problems like overcrowding of the curriculum.

## 2.3. Setting Out Credit Hours Policy

Three factors are taken into consideration during the design of our course credit hour policy:

- 1) The first was adjustment of program credit hour in relation to the contact time and the student workload for the purpose of preparation to academic accreditation.
- 2) The second factor was to conform with PBL philosophy that favor reducing lectures and encourage student-centered and critical thinking activities like self-directed learning, seminars, tutorials, group discussion, PBL sessions and practical sessions.
- 3) The third one was to keep flexibility for further reduction of lectures through forthcoming curriculum revisions.

We set a new credit hours policy after revision of several American Universities on the basis of an 18-weeks semester format, regardless of the length of course. Every learning activity was evaluated and defined then we assigned the equivalent workload and credit hours for it.

*Table (2). Description of the different learning activities*

Theory	Interactive Lecture	A lecture is an oral presentation where the instructor presents information, for most of the contact period with limited to moderate interaction with students in the classroom.
	Tutorial	An activity where the students under the direction of a faculty member, are encouraged to discuss, interact and analyze various aspects of the subject through oral and written communications.
	Seminar	Is an activity where a small groups of students under the direction of a faculty member engage in the advanced and intensive study of a selected topic(s) through oral and written communications.
	PBL Sessions	A learning experience whereby students work on a problem/case as part of a small group. Each student is expected to contribute actively to the learning process.
	Directed Independent Study (DIS)	A learning activity in which students learn independently, meeting periodically with a faculty member to discuss and report progress. It provides the opportunity to study material not usually covered or offered in the regular learning activities.
Practical	Practical/Laboratory	Is an experience in specially equipped facilities (laboratory or dissection room). Where the students perform some activity designed to enhance understanding of knowledge of a particular topic. With the goal of students' demonstration of an appropriate skill (i.e. a Biochemistry experiment, a dissection or practice history and physical exam on another student).
	The Clinical Skills Laboratory	Is a dedicated instructional room with dozens of interactive models and simulators for training and self-study. Also, appointments can be made by the students with the director to schedule sessions to develop, maintain or remediate clinical skills
	Clinical / bed-side teaching (BST)	An activity in which students, under the supervision of a faculty member, are involved with direct observation of patients that includes direct patient contact and/ or related clinical responsibilities (i.e. history and physical, writing orders, writing daily progress notes and patient-related communications).

## 3. Results

We suggested ratio of contact hour to credit hour equal to 1: 1 for theory activities which include lectures, tutorials, seminars & PBL sessions (50 minutes for 18 weeks equivalent to one credit hour of theory instruction or the equivalent per term). Directed independent study (DIS) be also considered a theoretical activity, but we suggested being calculated according to the ratio of the contact hour to the

credit hour equal to 3:1. Practical/ laboratory, skill lab sessions & bedside teaching sessions were represented the practical activities & we suggested being calculated with proportion of contact hour to credit hour equal to 2:1 for practical/ laboratory and ratio of 3:1 for skill lab sessions & bedside teaching. We applied the new policy to 11 courses of the hybrid PBL Curriculum of Najran College of Medicine and a report for curriculum reform was created.

*Table (3). Summary of ratio of contact hour to credit hour for all learning activities*

Lectures	PBL Sessions	Tutorial	Seminar	DIS	Practical /laboratory	BST/ clinical	Skill Lab
1=1	1=1	1=1	1=1	3=1	2=1	3=1	3=1

We found that the application of the new policy reduces percentage of lecture in different courses & gives a chance

for increase of self-study, practical & small groups learning activities on further curriculum revisions.

**Table (4).** Showed the percentage of lectures reduction after application of the new policy

Course	Pre-defined course Credit hours	% of Lecture reduction
Growth & Development	5( 4+ 1)	(21%)
Musculoskeletal System	7 (5+2)	(25 %)
Hematology & immunology	5(4+1)	(31 %)
Cardiovascular System	5(4+1)	(25 %)
Respiratory System	4(3+1)	(24 %)
GIT	7(4+3)	(66 %)
Endocrine	5(4+1)	(37 %)
Urinary	4(3+1)	(27 %)
Reproductive	5 (4+1)	(28 %)
CNS I	7 (5+2)	(30 %)
CNS II	6(5+1)	(28 %)

**Table (5).** Respiratory block course components before & after application of the new policy

Respiratory block 4(3+1)												
Course components (total contact hours and credits per semester) before application of the new policy												
	Theory					Laboratory	Practical				Total Practical	
	Lecture	Seminar	PBL Sessions	Tutorial	Total Theory		Skill lab.	DIS	BST			
Contact hours	29	6	16	12	63	20	3	16	15	54		
Credits per semester	1.6	0.16	0.88	0.33	2.97	0.55	0.05	0.27	0.27	1.14		
Respiratory block 4(3+1)												
Course components (total contact hours and credits per semester) after application of the new policy												
	Theory					Laboratory	Practical				Total Practical	% Lecture Reduction
	Lecture	Seminar	PBL Sessions	Tutorial	Total Theory		Skill lab.	DIS	BST			
Contact hours	22	6	16	10	54	20	3	16	15	54	24 %	
Credits per semester	1.2	0.33	0.88	0.55	2.96	0.55	0.05	0.27	0.27	1.14		

## 4. Discussion

Definition of course credit hours is variable between countries in one hand & between federal, and accrediting authorities at the same country on the contrary. Some states in USA and accrediting agencies see the definition of a credit hour as a matter of policy concern<sup>(9)</sup>. USA federal regulation defined credit hour as "...An amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than:

(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for fifteen to eighteen weeks or,

(2) at least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution, including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours<sup>(10)</sup>.

A debate was raised in some countries that are adopting credit hours either is it a system that facilitates change and reform, or it may retard it, as occurs in some areas in the United States where it has become rigidly codified and bureaucratized<sup>(10)</sup>. The standard practice used for credit hours calculation in Saudi medical schools seems to be an obstacle to curriculum revisions & innovation because it depends only on two forms of teaching activities either theoretical or practical. In Najran school of medicine, we scheduled for a process of revision of our primary hybrid PBL curriculum near graduation of the first batch of students.

Our target was to move gradually toward pure PBL curriculum through serial curriculum changes aiming to gradual reduction of direct lecture-based learning activities & increasing student-centered learning activities.

To achieve this goal, we work to approve a course credit hour system that helps to reduce lectures & at the same time gives flexibility to allow further reduction in lectures through future curriculum revisions without inflating the credit hours of the curriculum.

To overcome this problem, we look for a different approach to calculating credit hours & workload for variable learning activities used in PBL curriculum. We found that the adoption of an institutional credit hours policy helps to fix problems related to credit hours calculation in the PBL module & gives a flexibility for further curriculum improvement as needed. In our credit hours policy, we suggested to calculate tutorials, seminars and PBL sessions as theoretical activities with ratio of contact hour to credit hour equal to 1: 1 (50 minutes for 18 weeks equivalent to one credit hour of theory instruction or the equivalent per term).

Tutorials, seminar & PBL sessions are more interactive, student-centered learning activities than traditional lectures, so when awarded one credit hour for everyone contact hour per semester this will give a chance to reduce lecture through the decrease of theoretical activities from the predefined course credit hours. Of course, we have used spiral approach as a guide to reducing the theoretical activities. Most American higher schools defined theory activities as instructions or the equivalent that focused on principles, concepts, or ideas. Theory instruction includes lectures, PBL

sessions, Tutorials, seminars, presentations and other recognized types of instructions. They are awarding them credit hour similar to that assigned to lectures <sup>(9),(11),(12),(13),(14),(15)</sup>.

Directed independent study (DIS) be a mean to enhance self-directed learning & calculated with the ratio of contact hour to credit hour equal to 3:1. According to U.S. Network for Education Information (USNEI), independent study credit hour is calculated similarly to practice credit hours <sup>(12)</sup>.

Directed independent study (DIS) be a key point to maintain flexibility to our suggested course credit system where course instructors can decide to achieve some of the course objectives through DIS.

## 5. Conclusion

Application of the new credit hours policy to the hybrid PBL curriculum is functioning as intended: for adjustment of the curriculum for the purpose of academic accreditation, and excellence in medical education. The new policy can give flexibility to the process of curriculum reform that is highly relevant to PBL as an approach to health professions education philosophy. Further studies are recommended to evaluate the effect of application of institutional credit hours policy on different medical schools in Saudi Arabia.

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