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PERSPECTIVE, OPINION, AND COMMENTARY

Comparing the Tikrit University College of Medicine Iraq 1989 Curriculum with Modern Advancements in Medical Education

Ghanim Alsheikh [1] and Omar Mustafa [2,*]

[1] *Professor emeritus, and founding dean, Tikrit University College of Medicine, Tikrit, Iraq*
[2] *Department of Diabetes, Associate Director of Medical Education, King's College Hospital, London, United Kingdom*

[*] *Corresponding author email: omar.mustafa@kcl.ac.uk*

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Medical education has evolved globally, transitioning from traditional, experience-based training to modern, student-centered approaches. This study explores this historical shift, focusing on the Tikrit University College of Medicine (TUCOM), Iraq 1989 curriculum that implemented problem-based learning as a core strategy. The study compares one of the core components of the curriculum, the small group discussions and the 7-jump learning strategy, to how they map Entrustable Professional Activities (EPAs) with a suggestion to integrate EPAs into the curriculum.

Global Trends in Medical Education

Medical education worldwide has undergone continuous evolution to keep pace with advancements in medical science and practice. The aim has always been to produce competent graduates ready for medical practice. Over time, different approaches to curriculum design have emerged, reflecting shifts in educational philosophy. Approaches to the development of medical education curricula evolved over time [1, 2]. These models represent the core frameworks used globally in medical education. While variations exist, the trend has been towards greater integration, student-centered learning, and clinically relevant education. Healing: Early medical training relied on direct skill transfer through hands-on practice. Teaching was primarily experiential, where trainees learned

by observing and assisting physicians. This approach still exists in some traditional and alternative medicine practices.

i. Apprenticeship Model (1765-). Students trained under an experienced physician in a mentor-trainee relationship, gradually gaining independence. This model was common in North America and persisted in some regions like Iraq, where hospitals ran affiliated nursing schools.

ii. Subject-Based Curriculum (1871-Present). In the late 19th century, the discipline (subject) based reform movement began to emerge. In 1910, American medical schools adopted Flexner's science-based curriculum, integrating them into universities and requiring structured academic courses. This traditional model, still widely used, emphasizes separate disciplines with structured training and accreditation systems.

iii. Organ-System Integrated Curriculum (1951-Present). To address the separation of basic sciences and clinical disciplines, integration was introduced. The first structured implementation occurred in 1955 at Case Western Reserve University, where courses were reorganized around body systems. This horizontal and vertical integration approach remains influential.

iv. Problem-Based Learning (PBL) Curriculum (1969-Present) McMaster University pioneered the PBL model, shifting from passive learning to student-driven problem-solving. This method enhances self-learning, teamwork, and critical thinking. Universities such as Harvard and Maastricht later adopted it, and institutions in Iraq, Sudan, Egypt and several globally followed suit.

v. Case-Based Clinical Presentation Curriculum (1991-Present). The University of Calgary introduced this method, emphasizing clinical reasoning based on patient complaints. Students learn diagnostic processes through structured case discussions, simulating real-world clinical practice. This model was also implemented in Tikrit University College of Medicine in Iraq since 1992 with organizing training in the clinical blocks.

vi. Hybrid Curriculum (1990s-Present). Many medical schools now use a blend of traditional, integrated, and problem-solving methods. This ensures early clinical exposure while maintaining structured theoretical learning. Many medical schools in the UK and elsewhere adopted this mixed approach, balancing core sciences with problem-solving and case-based strategies.

Further to the above there have been several advancements in medical education from late 1980s onwards. During the last decade of the 20th century and the first few decades of the 21st century focus on medical education has been directed towards skills. Also, research, primarily from the field of medicine, shows that problem-based learning appears to be beneficial in fostering different skills for innovation [3–5].

Competency based medical education (CBME) has revolutionized medical training by emphasizing the attainment of specific skills and behaviors essential for effective practice. It offers a greater emphasis on outcomes and promotion of learner-centered curricula [6].

EPAs enable faculty to assess trainees and make competency-based decisions on the level of supervision required to attain the required outcomes and proficiency levels required at the end of training. EPAs are not substitutes to competencies. Competencies in medicine describe what a physician is required to do. EPAs describe the work required to attain those competencies and may require multiple competencies to perform tasks integrating knowledge, skills, interpersonal skills, communications, professionalism, practice-based learning, improvement and systems-based practice [7].

This approach ensures that learners develop the necessary competencies to meet professional standards. EPAs are a practical framework to assess and validate the competencies in a real-world clinical setting. The implementation of EPAs addresses some limitations of traditional competency-based models by providing observable and measurable activities that reflect daily professional responsibilities.

Curricular design now also focuses on bringing into alignment the methods of instruction, learning process, assessment methods and intended curricular outcomes. For example, the Association of American Medical Colleges (AAMC) core Entrustable Professional Activities (EPAs) are a set of professional activities that all first year residents must be able to perform on day 1 of residency with indirect supervision [8]. By focusing on outcomes and what the resident can do, curricular designs move away from focusing on one element per se to dealing with the learning and professional practice as a system with view to enable the learner to perform a set of capabilities entrusted by their trainers and beyond.

These principles are finding their way to all areas of post-graduate education around the world, for example, CanMEDS, ACGME Milestones, and GMC General Professional Capabilities frameworks. They focus on what curricula need to aim for in terms of capabilities at the end of training to train doctors capable of providing safe and effective care through a set of professional values, behaviors, skills and knowledge. That way, the training activities in the curricula will enhance the role of the training doctor (at residency and fellowship level) to not just recite medical knowledge but also incorpo-

rate other roles and responsibilities such as being professional, communicator, scholar, collaborator, leader, health advocate, and medical expert.

Many aspects of medical education have changed by the introduction of competency-based education (CBE), interprofessional education (IPE), and the increasing adoption of information technology (IT) particularly since the COVID-19 pandemic and advances in technologies such as artificial intelligence.

This article aims to review the curriculum implemented at Tikrit University College of Medicine (TUCOM) program in 1989 and how it aligned with CBME and advances at the time to generate a doctor able to practice medicine in residency and beyond.

Tikrit University College of Medicine (TUCOM) 1989 Program

A problem-based learning (PBL) curriculum was adopted in TUCOM upon its establishment in 1989 [9, 10]. The curriculum has gone through several iterations since 2001. These iterations are out of the scope of this article.

The 1989 curriculum is based on the following educational strategies:

- Community orientation where curriculum content has been derived from analyzing community needs and priorities.
- Problem-based learning: where learning is targeted through the activities rather than concentrating on teaching and that curriculum content is designed around priority health problems.
- Full integration where all subjects and disciplines are learned together and in a complementary manner to achieve problem solving. Thus horizontal (across the block and week) and vertical (across the six years of study) integration are achieved.
- Student-Centered Strategy: where learning, teaching, and assessing are designed to emphasize active student participation.
- Community-based training where students and staff are trained inside and outside college premises and get closer to community settings and problems.
- Self-assessment and lifelong learning.

The curriculum was divided into 3 phases to track the development of the student skills:

- Phase 1: Healthy community (Year 1)
- Phase 2: Pathogenesis (Years 2 and 3)
- Phase 3: Clinical intervention (Year 4 and 5) and Clerkship (Year 6)

The program included over 150 weekly structured instructor facilitated small group discussions (SGD) where all students practice in the first five years of study. These should not be confused with Small Group Teaching (SGT) where teaching is delivered and associated with some discussion between the students and the teacher. In SGD learning is driven by the students themselves using a structured method of learning, the 7-jumps method **(Table 1)**, that is facilitated by an instructor. These steps align with the Maastricht seven-jump process, a structured approach to PBL that enhances critical thinking and problem-solving skills in medical students. These weekly discussions based on clinical cases enabled all students to experience several skills in analytical thinking and decision making [11].

Applying critical thinking in problem-based learning (PBL) sessions in medical education involves several key steps:

i. Identify the problem: Students begin by analyzing a clinical case to understand the patient's issues, symptoms, and relevant medical history.
ii. Determine learning needs: Identify gaps in knowledge/information related to the case, prompting further research and study.
iii. Set learning objectives: Establish clear goals to address the identified knowledge/information gaps, guiding the research process.
iv. Collect data: Gather pertinent knowledge/information from medical literature, clinical guidelines, and patient data to inform understanding.
v. Evaluate and analyze data: Critically assess the collected information to ensure its relevance and accuracy.
vi. Decision making: Integrate the analyzed data to develop a differential diagnosis and formulate appropriate management plans.
vii. Reflect and provide feedback: Review the outcomes of the case discussion, reflect on the reasoning process, and identify areas for improvement.

In 1992, as the first batch of students reached the clinical interventional stage of their study in 4th year, the curriculum introduced a new way of clinical blocks based on patients' complaints instead of the problems used in the pathogenesis phase (Years 2 and 3) [12]. During these SGD sessions, adopted for years 1-3 as PBL and for years 4-5 as Case Based Learning, the TUCOM program aimed to achieve the following main

goals:

i. Create learning needs among all learners achieved through the following steps 1-5 **(Table 2)**.
ii. Create training opportunities for all learners to practice the skills of exploring different sources to fulfill their learning needs. Achieved through the following steps 6-7 **(Table 2)**.
iii. Create training opportunities for all learners to practice the identified learning needs in form of learning objectives. Achieved through the following steps 6-7 **(Table 2)**.
iv. Create training opportunities for all learners to practice self and peer evaluation skills. Achieved through the following step 7 **(Table 2)**.

The application of the clinical blocks based on clinical complaints was unique at the time in Iraq and globally when it was implemented in TUCOM in 1992. The clinical presentation curriculum in Calgary was approved in 1991 and was underway in 1995, as compared with the CPC adoption in Calgary in 1994 [13]. This innovative approach organizes medical education around approximately 120 distinct clinical presentations, similar to ways patients present to physicians such as "loss of consciousness/syncope.". In 2006, following a comprehensive review, the curriculum was further refined into the Integrated Clinical Presentation Curriculum [14].

In TUCOM, the clinical blocks were categorized according to topographical regions of the body as: Block 1 (Abdominal complaints), Block 2 (Thoracic complaints), Block 3 (Head and neck complaints), Block 4 (musculoskeletal and primary health care complaints) [11].

By year 6 (clerkship phase), the students are divided into clinical practice placements that ensure exposure to clinical scenarios whilst being embedded with the relevant clinical teams. This ensures a transitional phase towards clinical practice whilst utilizing the learning skills learned in the years before (problem based learning and critical thinking) to prepare them for residency.

Competencies development at TUCOM compared to the 2022 AAMC EPAs

Over the first 5 years of study, and emphasized in year 6 (clerkship), the competencies development aggregate and develop as the student moves across the phases of the study (healthy community, pathogenesis, clinical intervention, and clerkship) ensuring the development of all the clinical skills in preparation for day 1 of residency.

There are 13 EPAs described by the Association of American Medical Colleges (AAMC). These EPAs and their competencies provide a structured approach to ensuring that medical students are "practice-ready" for residency. This framework bridges the gap between undergraduate medical education and the expectations of residency programs [8]. Each EPA aligns with one or more competency domains, including:

i. Patient Care (PC)
ii. Medical Knowledge (MK)
iii. Practice-Based Learning and Improvement (PBLI)
iv. Interpersonal and Communication Skills (ICS)
v. Professionalism (P)
vi. Systems-Based Practice (SBP)
vii. Critical Thinking and Decision-Making (CTDM)

Table 2, describes the relevant competency domains that students practice and are assessed on. This practice is repeated every week of the c.150 weeks in the first 5 years of study. The set of 7 competency-domains is well distributed across the skills that are repeatedly practiced by students in TUCOM through the 5 years of study. In Year 6 (clerkship), those skills will be consolidated into more focused attachments with the clinical teams. During those attachments, clinical supervisors can assess the degrees of supervision required for the relevant clinical skills required to practice patient care. Those skills can be assessed using the relevant workplace based assessments.

Conclusion

EPAs were not implemented at the time of the implementation of the TUCOM 1989 curriculum. as this is more a recent concept emerging in the early 2000s. By following the 7 jump steps and relevant EPAs for workplace assessments, medical students can effectively apply critical thinking to clinical scenarios, enhancing their problem-solving abilities and reaching to case differential diagnosis and beyond plus preparing them for real-world medical practice. In conclusion, this analytical comparison provides insight into the TUCOM 1989 PBL curriculum that was planned and implemented to achieve skills for students to be ‘residency ready’ and beyond before the introduction of EPAs. It is essential that the programs should refocus on keeping pace with innovations and developments in medical education.

Table 1. TUCOM PBL Seven Jumps: Learning Week and Small Group Discussion

Jump	Activity	Description	Time
Jumps 1-5: First Discussion (Brainstorming) – 3 Hours			
All students equipped with a notebook to take and make notes throughout the discussion (mandatory).			
0	Team Management	Group nominates and elects a Chair and Reporter for the week, while reminding students and tutor of their roles.	10 min
1	Terminology	Students read the problem, identify difficult words or terms, and clarify meanings with peers.	10 min
2	Problem Definition	Discuss how to define the entire problem in one title sentence.	15 min
3	Problem Analysis	Break the problem into components, ensuring no part is ignored. A thorough and comprehensive analysis is required.	45 min
4	Learning Needs	Identify knowledge, skills, and attitudes needed to solve the problem. Items are categorized and simplified for clarity.	40 min
5	Learning Objectives	Set learning objectives for the week using the AvC3 formula: an active verb, C1-content, C2-conditions, and C3-performance criteria. These objectives guide learning through various activities, ensuring alignment with the problem's complexity.	40 min
5a	Peer Assessment	Conduct objective peer assessments by students and tutors using a checklist.	20 min
Jump 6: Learning and Teaching Activities for a Week			
6	Fulfill Learning Objectives	Seek knowledge through self-learning, peer discussions, guidance from senior students, teachers, books, journals, clinical settings, and community settings.	Week-long
Jump 7: Second Discussion (Debriefing) – 3 Hours			
All students equipped with a notebook plus any supporting material they can use in step 7b (120 min).			

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Jump	Activity	Description	Time
7a	Reviewing Learning Objectives	Students review their learning objectives from the beginning of the week and discuss whether additional essential objectives should be included.	30 min
7b	Solving Problem	Group members are randomly asked to share their learning experiences on objectives without prior assignment. The group provides evidence-based feedback, ensuring consensus before moving forward. Additional objectives are addressed through self-learning, with all members actively participating.	120 min
7c	Peer Assessment	Tutor-led and free self-peer assessment, with evidence-based evaluation using a checklist.	30 min

Table 2. Competency Domains Practiced in the Steps of the Weekly 7-Jumps Educational Cycles Across 150 Weeks in the TUCOM 1989 Curriculum

Step	Step Description	Educational Activity	Competency Domains Practiced
Jumps 1-5: First Small Group Learning Session			
0. Team Management	Group selects chair and reporter, recalls roles of chair, reporter, learners, and tutor.	Small group discussion	ICS, P
1. Terminology	Read problem/case; identify new terms and list learning needs.	Brainstorming	CTDM, ICS
2. Problem/Case Definition	Discuss and agree on how to define the whole problem/case.	Brainstorming	CTDM, ICS
3. Problem/Case Analysis	Analyze the problem comprehensively into components.	Critical analysis	CTDM, ICS
4. Learning Needs	Identify learning needs based on problem components.	Critical evaluation	CTDM, ICS
5. Learning Objectives	Construct learning objectives based on learning needs.	Data collection	CTDM, ICS
Jump 6: Practicing Skills Through Educational Activities			
	6.1 Self-Learning	Identify relevant knowledge to fulfill learning needs.	MK, PBLI
	6.2 Structured Field Training (Weekly)	Practice EPAs	PC, PBLI, ICS, P, MK
	6.3 Structured Clinical Training	Practice EPAs	PC, PBLI, ICS, P
	6.4 Simulated Skill Lab Training	Practice clinical skills at hospital and primary health care centers	PBLI, SBP
	6.5 Students Group's Community Research Project (Years 2-5)	Practice real research projects skills	SBP, PBLI, ICS, CTDM
	6.6 Lecture and Lab Practical	Evaluate collected data	MK, P
Jump 7: Second Small Group Learning Session			

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Step	Step Description	Educational Activity	Competency Domains Practiced
Reflect and discuss learning from educational activities following the first small group session.			

Abbreviations: PC = Patient Care, MK = Medical Knowledge, PBLI = Practice-Based Learning and Improvement, ICS = Interpersonal and Communication Skills, P = Professionalism, SBP = Systems-Based Practice, CTDM = Critical Thinking and Decision-Making.

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