KAMER HE 101 STAGE 1
HANDBOOK 2022

KOÇ UNIVERSITY
KOÇ ACADEMY of MEDICAL EDUCATION RESEARCH - KAMER

Educators' Portfolio Program

CONTENTS

HE101- Educators' Portfolio Program

STAGE 1

This document outlines Curricular Design for the STAGE 1 of HE 101 (Healthcare Educators' Portfolio) Program as approved by the Executive Committee (EC) of Koc Academy of Medical Education Research (the Academy). The curricular program follows the charter and mission of the Academy.

Educating the Educators: One of the most critical functions of the Academy is to develop a comprehensive educational program for all faculty involved in medicine and nursing education. The educational program is designed in three stages that contain increasingly complex topics from educator centered to student-centered and from classroom-based to workplace-based methods. Stage 1 is aimed at providing basic educator skills to all faculty, regardless of their academic track. The topics in Stage 1 include basic skills such as communication, professionalism, education design, large and small group teaching, student centered learning, giving and receiving feedback and assessment strategies. Stage 2 and 3 are aimed at faculty in an academic educator track and will be offered in subsequent years to those learners who successfully complete Stage 1.

All three stages of the educational program are directed by the Executive Committee. The Education Coordinator of KAMER is charged in the logistic coordination of the program. STAGE 1 curricular program is directed by Tarik Tihan with the assistance of Ms. Merve Kurhan Togay (the Academy Secretary) and the Education Coordinator Ms. Sibel Ölmez who report to the Executive Committee of the Academy.

HEALTHCARE EDUCATORS' PORTFOLIO STAGE 1

A Primer to Concepts, Methods and Applications

COURSE DESCRIPTION

Learning to teach must be a critical activity for all academic faculty members whether in a structured and formal manner or through pragmatic, "live and learn" activities during their careers. While some people believe that being a teacher is a natural skill, research and literature data suggest just the opposite. It has been proven through numerous studies that teaching in a structured and effective way is primarily a "learned" behavior. Some faculty members, who thought of themselves as excellent teachers, have found themselves to have repeated the same ineffective and incomplete teaching methods for many years. While it may be very important to have the right personality to motivate, engage and excite students to learn, it is equally important to learn the methodologies on how to teach, how to master the concepts, be familiar with constantly evolving methods and understand the applications of educational strategies. The healthcare educators' portfolio developed by KAMER aims to address the basic and advanced competencies for academic educators in health sciences. The program can be taken across multiple years as long as the participants successfully complete all three stages. KAMER aims to improve communication among medicine and nursing school faculty members, establish a common language, and to improve the competencies of all academicians who wish to be recognized as effective teachers.

TARGET AUDIENCE

Stage 1 of the three-stage course provides the fundamental building blocks of an educational academic career and is critical to those who wish to improve their teaching skills. This course is designed for all faculty who have a responsibility to teach undergraduate or graduate students in medicine and nursing school.

COURSE TOPICS

Learning Basic Concepts Through Course Participation

- A. Introduction: Basic Terminology in Education
- B. Instructional Design Basics
- C. Large Group Teaching (Lectures)
- D. Small Group and Student-Centered Teaching
- E. Giving/Receiving Feedback
- F. Assessment of Learners

COURSE REQUIREMENTS & PREREQUISITE

1. Priority is given to teaching faculty at KUSOM and KUSON, but the course is offered to any active faculty member in a medical or nursing school. There are no prerequisites for KU faculty members. Faculty members are expected to be enrolled in the entire course (STAGE 1) and should carefully review the course document and schedule. Participants must ensure that their schedule and other academic responsibilities will allow them to complete the course in a timely manner. The total duration of the course is approximately 30 hours and the course is given over 4 days. Successful completion requires attendance in at least 22 hours of interactive sessions. The participants are asked to take a pre-course survey before they start the course. Attendance is a critical component of the course; the course faculty will take attendance to make sure each learner has participated in all the critical activities of the course. A record must be kept by the learners to document that all the educational material and lectures are reviewed. The course will be using interactive applications such as SOCRATIVE (www.socrative.com), MENTIMETER (www.mentimeter.com), PADLET (www.padlet.com) and web-based program BLACKBOARD (https://ku.blackboard.com). Please make yourself familiar with these programs/applications.

2. The participants must successfully complete all assignments of the course including the pre-course survey and exit survey to receive the certificate of completion.

3. Academic integrity, ethical behavior and observance of unbiased and non-discriminating behavior are expected and we do not expect any diversion from the ethical standards for Koc University

4. Applications to the course must be made at least 3 days prior to the commencement of educational activities. Registration will be closed once the educational activities begin.

5. Participants should review the KAMER web page to learn about the program and review educational materials and videos https://kamer.ku.edu.tr/

LEARNING OBJECTIVES

General Learning Objectives for Stage 1

The overall learning objectives of stage 1 aim to provide the educators with the basic skills in adult education. The learners will be able to describe key concepts of educational strategy, define and describe the basic tools of training in the academic environment such as large format lecture design, small group teaching, giving and receiving feedback, formative assessment methods and workplace-based assessment. The concepts, principles and strategies as well as terminology required to establish an effective learning environment will be discussed. The lectures and discussion groups constitute the latter phase of Stage 1 and allow faculty to build specific skills. The specific learning objectives of stage 1 is to;

- Develop a clear understanding of adult education and concepts in academic teaching as well as,
  - be able to describe the key concepts (see the syllabus) to others.
  - be able to describe the significance of key concepts healthcare education
- Define the basic concepts in adult education

- Design an engaging lecture in any area of health sciences for undergraduate students

- Critically evaluate a lecture given by a faculty for undergraduate students and provide feedback

- Design a small group activity for undergraduate or graduate students

- Describe how to give and receive feedback, create a scenario to demonstrate effective and ineffective feedback

- Define key parameters of assessment for MCQ (Multiple Choice Questions), Essay and Oral examinations.

- Describe the fundamental reasons for assessment using MCQs, Essay and Oral Examinations

- Propose a workplace-based assessment strategy in a clinical or laboratory setting

LENGTH, DATES AND LOCATION

The course will be given during the academic year and will consist of didactic lectures, discussion sessions, team-based learning, role plays, presentations and reflective sessions. The total duration of the course is approximately 30 hours and the course is given over 4 days. Successful completion requires attendance in at least 22 hours of interactive sessions. Dates, times and the location will be announced on the website and through campus-wide communication for the upcoming courses. Detailed information can be obtained from KAMER Executive Secretary (kamer@ku.edu.tr). Please refer to KAMER website for educational material, references and further information (https://kamer.ku.edu.tr/).

A. Introduction: Basic Terminology in Education

Standards:

One of the most critical aspects of educational design is to determine standards that must be followed consistently during an educational activity. The educational content must be presented in a manner that enables the assessment of graduates' performance in compliance with the professional requirements or generally accepted guidelines. The educational standards must be constructed by a joint effort of content experts and the representatives of the educational infrastructure, i.e. all stakeholders. Any standard will need to be defined in terms of its function, as well as its form. There are typically 4 different types of standards.

1. An **absolute standard** refers to the knowledge and skills a student must possess in order to pass a given course. Absolute standards remain the same over multiple administrations of the test and are not dependent on the relative content specifications of the test. These are also known as core standards, which are critical to professional practice. However, absolute standards also change with the advancement of the profession and science over time.

2. A **relative standard** can be set at the mean performances of the candidates, or by defining the units of standard deviation from the mean. A relative standard may vary from year to year due to shifts in the ability of the group and may result in a fixed annual percentage of failing students, particularly if the scores have a normal distribution in every administration of the test.

3. A **norm-referenced standard** is a standard based on the representative group of the candidates' population. Credentialing organizations use norm-referenced orientation, in which the standard is based on the performance of a large, typically nationwide group of learners equivalent to the candidates taking the test. The norm-referenced standards may shift according to the performance of the population on which the standard is based.

4. A **criterion-referenced standard** is a fixed standard that may undergo periodic re-evaluation based on candidates' performance over time. The criterion reference that is developed through evaluation of the specific group of learners links the standard to the level of competence.

In addition to four levels of standards, there are three critical forms of educational standards that require definition. These educational standards need to be defined for each learner group in order to present a clear definition of what is meant by a standard:

1. ***Content standards or curriculum standards:*** Skills, knowledge, attitudes and values; what teachers are supposed to "teach", and students are expected to learn. Thus, the content standards define what is to be taught and learned. Content standards can be also defined as "essential (core) requirements" that the medical/nursing curriculum should meet to equip graduates with the knowledge, behavior, and skills necessary to practice their profession.

2. ***Performance or assessment standards*** define how well the content standards were mastered by the students and correlated with the expected professional requirements. Performance standards define how well the learning objectives were absorbed.

3. ***Process or opportunity standards*** define the availability of the conditions necessary for an optimal learning environment, such as availability of staff and other resources necessary so that students can achieve content and performance standards.

EXPECTED OUTCOMES

Competence

Possession of a satisfactory level of relevant knowledge behavior and skills that satisfies the requirements of a profession at a certain point in the educational process. The level of knowledge, behavior and skills allows the individual to perform the necessary tasks in a particular situation. Competence differs from "performance", which implies actions taken in real life situations. Competence is also not the same as "knowing", it is rather the ability to recognize one's own limits. Competence is "knowing what you know and don't know and being able to appreciate the difference. As professionals become more experienced, their general competence increases and the ability to test their actual understanding becomes more difficult. Competence may be perceived in different platforms, and for healthcare professionals' clinical competence is a key determinant. Clinical competence is the mastery of relevant knowledge and skills at a satisfactory level including interpersonal attributes at a certain point, such as at graduation. In the case of clinical training, teachers develop hypothetical situations, define what the student is expected to do and then test their ability to do it. In real life, clinical problems may not have clear answers and may have more than one solution. In such situations, an experienced doctor sifts through a wide range of options and in some cases the solution may be entirely novel to her/him. Therefore, competence itself is only of value as a prerequisite for performance in a real clinical setting and does not correlate with performance in practice.

Performance

What an individual actually does in a real-life situation. In healthcare, it is what a nurse or a doctor actually does in an encounter with a patient by applying her/his knowledge and skills, and by arriving at a solution with the use of her/his clinical judgment and interpersonal communication skills. Performance in this setting requires competence

as well as the ability to use it with professional maturity and ease in making difficult decisions. Thus, the cumulative actions of a professional constitute performance, yet determining what constitutes better performance is subjective and difficult to demonstrate. Assessment of clinical performance is of the greatest importance and is often difficult to measure.

Global Minimum Essential (Core) Requirements

Specification of the competencies which students should possess at graduation, regardless of where they are trained. In medical education, represented at international, national, and local layers, specific to given settings and cultures where the physician will practice in addition to universal competencies required by physicians throughout the world.

EDUCATION LEXICON

Active learning: educational methods that require the student to be the active participant and engage in the learning process by "doing" rather than listening. Problem solving, case studies, role plays, discussions, laboratory exercises are examples of active learning processes in contrast with lectures, where the student just listens. Active learning places the responsibility of learning on the learner.

Andragogy: the method and practice of teaching adult learners, adult education. The theory of adult education was initially proposed by the American educator Malcolm Knowles (1913-1997)

Assessment: a system of evaluation of learner accomplishments using standards and well-defined measurements. The purpose of assessment is to make a judgment on the individual's knowledge, behavior or skills, rank learners according to the level of their performance, measure improvement over the educational timeframe, or evaluate strengths and weaknesses. There are numerous types and attributes of assessment.

Asynchronous learning: a general term used to describe forms of education that do not occur in the same place or at the same time. The term is most commonly applied to various forms of digital and online learning in which students learn from instruction—such as prerecorded video lessons or game-based learning tasks that students complete on their own—that are not being delivered in person or in real time.

Backward design: the process of instructional design that aims to achieve learning by first determining what the final outcomes are and then planning assessment strategies and finally determining methods of instruction and assignments. It allows instructors to plan lessons and courses with a focus on student learning.

Basic sciences: is a term that is often used but its clear meaning is not emphasized. In medical education literature, basic science is a term used for curricular content that is not specific to clinical disciplines or medical practice. The individual scientific disciplines are referred to as "sciences basic to medicine". In other realms, basic sciences may

be defined different than medical education

Benchmark statement: general expectation of an educational program about the competence and performance of a learner at a specific level. These statements provide a general guidance for articulating learning objectives and outcomes.

Biopsychosocial model: educational model that considers the social, psychological, and cultural dimensions of patients and their illnesses in the design on medical/nursing curriculum.

Blended learning: combination of live, in-person as well as electronic or technology-mediated learning methods within the same educational program. Blended learning attempts to take advantage of the strengths of both in-person and distance learning.

Block teaching: curricular organization in which students are taught the basic and clinical sciences that are relevant to a particular organ system. Some older block approaches also separate basic sciences and clinical sciences as separate "blocks"

Bloom's taxonomy: a system of classification of levels of adult learning process originally published by Bloom et al. in 1956. Bloom's taxonomy recognizes cognitive, affective and psychomotor domains. The cognitive domain includes levels with increasing complexity (professional authenticity) from Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. Due to the increasing complexity from knowledge to evaluation, Bloom's taxonomy is often depicted as a pyramid. The "revised" Bloom's taxonomy uses nouns for the same levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating. In the revised taxonomy, creation is considered the highest level of complexity.

Figure 1: Revised Bloom's Taxonomy
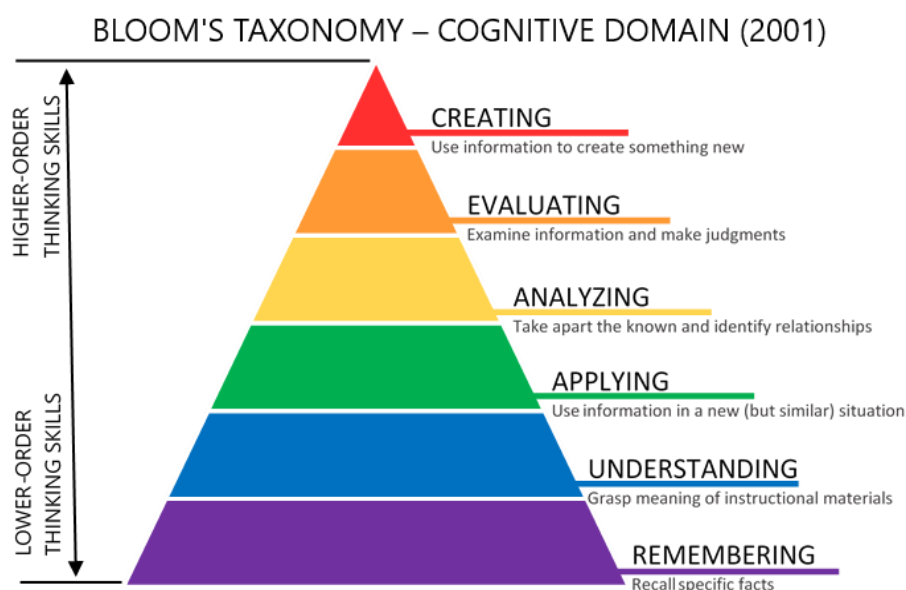
Case-based teaching: discussion of a real or simulated patient to initiate analysis, problem solving, evaluation and reasoning. In active learning, the students actively seek the answers and discuss the problems rather than sitting in the audience and listening to the experts.

Collaborative learning: the student-oriented teaching method in which the students learn together without being assigned particular roles. Students work as a team to solve a problem or to complete a task, such as making a joint presentation.

Competency-based learning: refers to systems of instruction, assessment, grading, and academic reporting that are based on students demonstrating that they have learned the knowledge and skills they are expected to learn as they progress through their education. In public schools, competency-based systems use state learning standards to determine academic expectations and define "competency" or "proficiency" in a given course, subject area, or grade level (although other sets of standards may also be used, including standards developed by districts and schools or by subject-area organizations). The general goal of competency-based learning is to ensure that students are acquiring the knowledge and skills that are deemed to be essential to success in school, higher education, careers, and adult life.

Contact time (or hours): the amount of time within a curriculum when the faculty are in direct communication (face-to-face) with the students.

Continuing medical/nursing education (CME): the learning of professionals during their practice in order to maintain their skills, keep up with the advancing knowledge and master novel skills. Healthcare professionals require continuing medical education in order to be able to utilize the relevant and current practices and be aware of advancing knowledge.

Cooperative learning: an educational approach which aims to organize classroom activities into academic and social learning experiences. There is much more to cooperative learning than merely arranging students into groups, and it has been described as "structuring positive interdependence". Students must work in groups to complete tasks collectively toward academic goals. Unlike individual learning, which can be competitive in nature, students learning cooperatively can capitalize on one another's resources and skills (such as asking one another for information, evaluating one another's ideas, monitoring one another's work). The teacher's role changes from giving information to facilitating students' learning. Everyone succeeds when the group succeeds.

Core competencies: knowledge, behavior and skills that are fundamental (or essential) to a scientific discipline and are critical to learn in order to perform the individual's role as a health care professional. Core competencies reflect the values, knowledge, attitude and skills of a competent physician.

Criterion-referenced assessment: an assessment strategy designed to measure student performance against a fixed set of predetermined criteria or learning standards—i.e., concise, written descriptions of what students are expected to know and be able to do at a specific stage of their education. In elementary and secondary education, criterion-referenced tests are used to evaluate whether students have learned a specific body of knowledge or acquired a specific skill set.

Curriculum: the collective composition or blend of educational strategies, content, list of learning objectives, educational experiences, educational formats, assessment methods within a particular timetable, in a social and cultural learning environment. Curriculum is also defined as a standards-based sequence of planned experiences where students practice and achieve proficiency in content and applied learning skills. Three types of curricula are described 1) explicit (stated) curriculum, 2) hidden (unofficial) curriculum), 3) absent (excluded) curriculum. Others have described 7 different curriculum types (assessed, hidden, learned, recommended, supported, thought written).

Didactic teaching: teaching practice using lectures to convey information, typical example of a teacher-centered or educator-centered learning.

Domain: a scope of knowledge, behavior and skills and professional practice which can be combined into one cluster of educational format and needs to be taught during the medical/nursing curriculum. Domain is a discrete sphere of knowledge composed of interconnected data.

Evaluation: *"Determination of the value, nature, character, or quality of something or someone"* (Merriam-Webster). *"Evaluation is the collection of analysis and interpretation of information about any aspect of a program of education or training as part of a recognized process of judging its effectiveness, its efficiency and any other outcomes it may have."* Mary Thorpe in "Handbook of Education Technology" (Ellington, Percival and Race, 1988)

Difference between Assessment and Evaluation: Assessment is defined as a process of measuring the quality, value or importance of someone. Evaluation makes a judgment about those measurements (values, numbers or performance) for the individual. Assessment identifies the level of performance, whereas evaluation determines the degree to which the goals are attained.

Evidence-based medicine: medical knowledge or practice including diagnosis, treatment and prognostication based on evidence supporting the effectiveness of the approaches or clinical practice.

Evidence-based nursing: an approach to making quality decisions and providing nursing care based upon personal clinical expertise in combination with the most current, relevant research available on the topic.

Feedback: information given to the learner and/or teacher about the learner's performance relative to learning objectives or outcomes. Feedback aims at producing improvement in students' learning and competencies. It is most

productive to a student's learning when they are provided with an explanation as to what is accurate and inaccurate about their work.

Fish bowl: To encourage participation by all students, a fish bowl is a good approach for discussing dilemmas or debates. Some of the students sit in an inner circle (the fish bowl) and the others are around the edge observing the discussion. Allow the students in the inner circle a time to prepare ideas and questions in advance, while you brief the students who are observing what they should be listening for. The idea is that the participants in the inner circle are more likely to get involved than they would if it was a large group discussion, and the students observing learn from their peers.

Flipped classroom: a teaching method where the traditional roles of teacher and learners are "flipped". While there are many formats and methods applicable under this term, flipped classroom implies that the learners prepare for the class by assigned activities followed by the classroom time being devoted to discussions, problem solving and reconciliation of ideas. Learners should take responsibility for researching the content, finding the key issues and uncertainties.

Formative assessment: evaluation of students' performance with the intent to provide feedback and improve the performance rather than simply documenting the performance in an examination.

Graduate medical education: in the US, this term refers to formal training in medical specialties that prepares the student for the practice of a particular specialty. Graduate medical students are often referred to as "residents" an arcane term from early years when the students literally "resided" in the hospital all year round.

Graduate nursing education: refers to Master of Science (MSc) and Doctoral (PhD) programs.

Hidden curriculum: refers to the unwritten, unofficial, and often unintended lessons, values, and perspectives that students learn in school. While the "formal" curriculum consists of the courses, lessons, and learning activities students participate in, as well as the knowledge and skills educators intentionally teach to students, the hidden curriculum consists of the unspoken or implicit academic, social, and cultural messages that are communicated to students while they are in school.

Horizontal integration: integration of topics and learning objectives throughout a year of the curriculum without regard for the organization of individual courses. Horizontal integration often leads to concurrent sessions addressing the same problem by different disciplines or experts. (see integrated teaching)

Instructional design: the analysis of learning needs and systematic development of instruction. Instructional design models typically specify a method that, if followed, will facilitate the transfer of knowledge, skills and attitude to the students.

Integrated teaching: the teaching strategy that attempts to combine subjects and incorporates them in a meaningful context. Subjects are often presented from different perspectives as a meaningful whole. Integration may be vertical or horizontal.

Interdisciplinary: interaction or collaboration across disciplines. Since the definition of the term "discipline" may be perceived in different ways, interaction between nursing and medicine, as well as interaction between physiology and biochemistry can be considered interdisciplinary. The main educational usage of the term interdisciplinary is to highlight collaboration of two or more particular branches of scientific knowledge in order to achieve a common, more holistic understanding.

Interprofessional education: education programs that are coordinated or organized by two or more different professions, in which professionals learn with each other to improve competencies.

Jigsaw model: an active learning method in which the classroom is divided into groups of 4-5 learners and the entire learning material is divided equally among the learners. Each le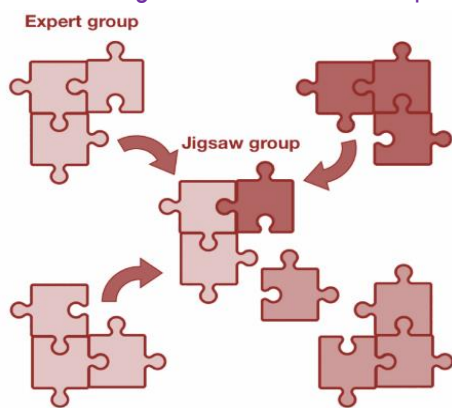arner receives a different portion of the information. Then the learners from each group assigned to the same task get together and discuss their topic. Once these groups complete their discussion, the original groups are reassembled and each student presents their topic to the group, after which the group tries to put the entire story together. At the end of the session the teacher may administer a quiz about the subject matter.

Figure 2: Scheme of the jigsaw activity

Learning Objective: what the learner needs to be able to do after taking part in the educational activity. Learning objectives need to be specific, measurable, attainable, realistic and defined by a time period (time-bound).

Norm-referenced testing: refers to standardized tests that are designed to compare and rank test takers in relation to one another. Norm-referenced tests report whether test takers performed better or worse than a hypothetical average student, which is determined by comparing scores against the performance results of a statistically selected group of test takers, typically of the same age or grade level, who have already taken the exam.

Objective structured clinical examination (OSCE): an in-vitro assessment method in which the students' performance of specified clinical tasks and skills are tested in a structured environment, which is considered to be "objective" since standardized patients and environment are used.

One minute paper: an assessment strategy that can be used both as a formative or summative tool. The students are asked to write answers to one or two questions that are critical to the lecture topic. Examples include "what is the most critical issue in this topic?", "what is the most important public health problem that may arise from this issue", "what was not clear in this lecture" etc. The answers may be collected at the beginning of the class for concurrent discussion or may be collected at the end of the lecture to provide an assessment of lecture efficacy.

Portfolio: a compilation of educational record assembled for the purpose of (1) evaluating coursework quality, learning progress, and academic achievement; (2) determining whether students have met learning standards or other academic requirements for courses, grade-level promotion, and graduation; (3) helping students reflect on their academic goals and progress as learners; and (4) creating a lasting archive of academic work products, accomplishments, and other documentation. Advocates of student portfolios argue that compiling, reviewing, and evaluating student work overtime can provide a richer, deeper, and more accurate picture of what students have learned compared to traditional assessment measures.

Posters & gallery walk: Another group activity to engage students in is a poster and gallery walk. Give groups of students an assignment that they need to work on together and present their ideas on a sheet of chart paper. Once they have completed their poster, have them display it on the wall around the room. One of their group will stay with the poster and help to explain it as the class circulates to look at all of the posters. Students take turns standing by their poster so each of them has the chance to visit the other groups' posters. You could also get students to feedback on what they learnt from other groups' posters to further their understanding of other topics.

Preceptorship: learning process in which a student is assigned to a practicing professional for a specific amount of time in order to observe the practitioner in a real life setting and to observe professional conduct.

Problem-based learning: a teaching approach that utilizes small groups which engage in self-directed learning in order to acquire knowledge, skills and behavior to solve a specific clinical or scientific problem. The method uses problems as models to allow students to acquire the necessary knowledge.

Professionalism: adherence to the set of values, guidelines and codes of conduct formally accepted as well as informally required by practitioners of a profession. The key value of professionalism includes some universal concepts that cross over different professions, as well as profession specific values that identify the unique features of a profession. The US based organizations include altruism, accountability, duty, excellence, honor, integrity and respect for others as key elements of professional behavior. Professionalism for healthcare professionals also includes acting in the patients' best interest, responsiveness to the healthcare needs of the society, and maintaining the highest standards of excellence (a vague term) in the practice of medicine/nursing.

Proficiency-based learning: system of instruction, assessment, grading, and academic reporting that are based on students' ability to demonstrate their acquisition of knowledge and skills they are expected to acquire as they progress through their curriculum. Proficiency-based systems use national or international learning standards to determine academic expectations and define "proficiency" in a given course, subject area, or grade level based on such standards.

Role play: Teaching method in which learners and sometimes teachers simulate a scenario by performing the role of different characters and pretend to be someone other than themselves. In role play the learners are put in decision making roles and reflect on their own acting. Role play is an example of an experiential learning technique.

Rubric: an evaluation tool or set of guidelines used to promote the consistent application of learning expectations, learning objectives, or learning standards in the classroom, or to measure their attainment against a consistent set of criteria. In instructional settings, rubrics clearly define academic expectations for students and help to ensure consistency in the evaluation of academic work from student to student, assignment to assignment, or course to course. Rubrics are also used as scoring instruments to determine grades or the degree to which learning standards have been demonstrated or attained by students.

	Exemplary(3)	Competent(2)	Developing (1)
Patient Care	Immediate eye contact & rapport, Let patient tell story	Eye contact and good questions about patient's CC	No eye contact & wrote notes while questioning
Medical Knowledge	Expressed extensive medical knowledge	Presented satisfactory medical knowledge	Missing or incorrect medical knowledge

Figure 3: Developing an example rubric (Source: UMASS Medical School)

Scaffolding: a variety of instructional techniques used to move students progressively toward stronger understanding and greater independence. The teachers provide successive levels of temporary support that help students reach higher levels of comprehension and skill acquisition that they would not be able to achieve without assistance. Like physical scaffolding, the supportive strategies are incrementally removed when they are no longer needed, and the teacher gradually shifts more responsibility over the learning process to the student

Shelf examination: examination questions prepared without concern of the type and cultural background of students. Shelf examinations are typically given to a large number of students, which provide statistically desirable validity and reliability scores and the questions can be revised to create desirable statistics. Shelf examinations require question databases.

Snowballing: a method of active learning in which an increasing number of learners are asked to participate in a particular debate. First the topic or question is given to a pair of students to discuss, then they join another pair to compare their discussions and the groups become larger until the whole class has met one another, and a final conclusion is expected.

Standardized patient: an individual, often an actor who is trained to accurately portray the symptoms, complaints and behavior patterns of an actual patient afflicted with the same disease.

Student-centered education: education strategies that considers learners as active participants and designers of learning. Learners are responsible for identifying the strengths, weaknesses, gaps in their knowledge and work together to fill the gaps in the knowledge or skills. Teachers are expected to "facilitate" learning rather than "lead" or "instruct". Opposite of teacher-centered education.

Summative assessment: assessment of students with the primary goal of ascertaining success. The summative assessment provides a final decision as to whether a student has acquired the learning objectives of that particular course. Summative assessments provide pass or fail decisions, whether on a numerical or qualitative scale.

Synchronous learning: forms of education and learning that occur at the same time, but not in the same place. The term is most commonly applied to various forms of digital, and online learning in which students learn from instructors, colleagues, or peers in real time, but not in person. For example, educational video conferences, interactive webinars, chat-based online discussions, and lectures that are broadcast at the same time they are delivered would all be considered forms of synchronous learning.

Teaching portfolio: a faculty member's curriculum vitae specifically geared to document activities as an educator, including but not limited to direct or indirect teaching, education design, research, mentoring and administration. Teaching portfolio is a critical component in the promotion process of academic educators.

Team-based learning: "*Team-Based Learning is an evidence-based collaborative learning strategy designed around "modules," that are taught in a three-step cycle: 1-preparation, 2-in-class readiness assurance testing, 3-application-focused exercise. Students must complete preparatory materials before a class or the start of the module. Materials may be text or visual and set at a level that is appropriate to the students and the course.***"** (*https://www.teambasedlearning.org/)*

Think-pair-share: an interactive teaching method in which the students are given a question to think (sometimes investigate) on their own. After sufficient time (depending on the complexity of the question), the students are paired with partners to discuss and compare their answers. This discussion period may again last 10-20 minutes, based on the question. In the final phase, the lecturer randomly asks students to share what they have concluded with the

class and summarize their discussion. At the end of the sharing period, the lecturer can summarize what has been discussed.

Three-step interviews: a cooperative learning strategy, the three-step interview encourages students to develop active listening skills by quizzing one another, sharing their thoughts and taking notes. Students work in groups of three, taking on the roles of the interviewer, interviewee and notetaker.

Assign the class a theme or topics of discussion and then give students five minutes to interview each other about the key information relating to the topic in question. After the time has passed, get the students to rotate roles. This allows them to apply different questioning strategies, reflect on their understanding of the topic and collaborate in their groups as they take on each role.

Undergraduate medical education: typically in the United States, undergraduate education refers to 4 years of medical school after which the student receives a medical doctorate diploma (MD degree).

Undergraduate nursing education: typically means four years of university-level education offering a bachelor's degree, preparing individuals to work as registered nurses.

Vertical integration: integration of topics and learning objectives across the years of the medical/nursing curriculum without regard to the organization of individual courses. Vertical integration requires coordination of learning objectives across all the years of medical/nursing school. (see integrated teaching)

B. Instructional Design Basics

Where do you begin when you are asked to teach a class or a course? You would have the name of the course and possibly the composition of your class, but what else do you need? What should you do to design an effective course? Obviously planning well ahead of time will make sure that your teaching is effective and addresses the needs of your learners.

In adult learning (andragogy) the systematic development of instruction using design theories and methodology is known as Instruction Design. This systematic development ensures that the critical issues are addressed in the planning of the educational activity in question. The design should make sure that: 1- there is a need for this learning activity, 2- the learning objectives and formats are well-designed and appropriately chosen. 3- the quality assurance of the learning activity is planned, 4- assessment, success parameters and remediation are also included in the initial plan.

The design of medical and nursing education requires understanding of adult learning principles, which is distinct from pedagogy, child education. In adult learning:

- Adults are interested in learning subjects that have direct relevance to their lives. The designers should be able to answer "why am I learning this? Why is it useful to know this?"

- Adults learn best when they are "ready to learn", so motivation is key

- Adults need to be involved in the planning and evaluation of their learning

- Experience including mistakes provides the best means of learning

- Adult learning is problem-centered rather than content-oriented, and more realistic than simulated

- Adults learn best when they are aware of what they need to learn

- Immediate, positive and non-judgmental feedback is effective in adult learning

INSTRUCTIONAL DESIGN COMPONENTS

Many instructional models or approaches use **1) analysis, 2) design, 3) development, 4) implementation and 5) assessment** as the five critical phases, each of which should be carefully executed with the intended outcome in mind. The designer of the learning activity should be a subject matter expert and should have acquired the necessary instructional design skills, so these five phases are successfully implemented. The experience of the designer also ensures that the design is realistic and will meet the identified needs in the projected time frame.

1 Analysis: The initial phase is essentially a needs assessment project, which will provide the information needed to conduct all the other phases of the design process. One of the first issues to examine is the identification of

knowledge, behavior and skills needed for the professional. In most instances, national regulatory organizations or the school curriculum committees may already have identified the knowledge, behavior and skills required to successfully complete the training. However, in most instances, these guidelines are not specific enough, so it will be up to the designer to select knowledge, behavior and skills with specific granularity. Most curriculum committees may not provide specifics to determine which achievements should be expected. This will necessitate a **content analysis** by the designer. Determining the specific content that will be taught in a particular course should ensure that students will acquire the necessary competence and demonstrate satisfactory performance. Content analysis may be performed using several approaches including:

- Identify any national requirements for certification or licensing
- Refer to subject matter experts for acceptable content
- Literature and textbook analysis to determine what has already been identified
- Discussions with students and graduates about their educational needs and gaps
- Focus groups with colleagues in the same discipline
- Review of other well-established courses with similar educational goals
- Surveys of educators and students using questionnaires

In the analysis phase specific questions should be adequately addressed and clearly articulated. Some of the critical questions include the following:

1. Why do you need this course and who needs this course?
2. What is the evidence for this educational need?
3. What are the goals of this course, and for whom?
4. How did you identify the learning objectives? How are they justified?
5. What are the expected outcomes and how will you measure them?

2 Design: Even though we name the entire process "instructional design", a specific phase of this process includes creating a blueprint of the educational activity. This design phase should be considered as a game plan before the players are set on the field. This phase requires the construction of **specific learning objectives**, **course syllabus**, **course schedule**, **delivery method, course environment, assessment.**

Each one of the bolded items above require time and effort. Specific learning objectives should be written in the so-called SMART format and the cumulative list of learning objectives should be attainable during the course, and not require additional time once the course is completed. Course schedule may need to be coordinated with a number of stakeholders, including other courses and the curriculum committee. The delivery method or educational formats MUST be selected based on the learning objectives. Knowledge based objectives can be given via didactic lectures,

but skills and behavior require much more interactive methods. Course environment can be traditional classroom, internet, distance learning using a hybrid strategy or even self-study. Some courses blend some of these environments for maximum efficiency and time management. Assessment will need to be considered at this stage, but a full assessment strategy with remediation must follow the initial considerations.

3 Development: The main items in the development phase are the creation of the course materials such as handouts, presentation notes, problems exercises, exams, surveys, documents, references, selection of faculty, instruction of faculty, orientation for staff if necessary, and development of logistics for the course environment. A real life walk through is a useful approach to go through the entire course procedures before the students arrive and the actual course begins, making sure all the necessary hardware and software in place, and all the electrical and electronic instruments are functional is a step most designers overlook in the development phase and pay dearly during the course when valuable time is lost for "technical reasons". A good development phase should account for all the mishaps and develop contingencies and make support staff available when such contingencies become necessary.

4 Implementation: This is the fun part of the whole effort when the teachers face the students (sometimes virtually) and the true "contact time" comes. This phase becomes an easy walk if the prior phases are well organized and well thought. Most of the deficiencies of the analytical, design and development phase can be identified during the implementation phase, so constant and intense monitoring of the implementation phase must be done. The data provided from these monitoring efforts will be key in the next cycle of the educational effort.

5 Assessment: Assessment of a course must be conducted as a two-way street. The designer must assess the success of students in achieving the learning objectives, must provide a formative assessment component that allows remediation during the course and also assess the efficacy of teaching and the strengths and weaknesses of the course design. In addition, assessment must include a remediation phase or at least consider how remediation can be achieved if the student's performance in summative examinations is deemed insufficient. This may require the student 1-take the course again, 2- take a remediation course or remedial tutoring, or 3- retake the summative examinations. The assessment of learners should clearly identify what successful completion means. It is not simply enough to administer a test and allow those to get 50% or 60% to be considered successful. The course objectives, especially core objectives and what the students must know before they can be deemed successful should be clearly outlined. The determination of success is best made using multiple assessment methods both formative and summative during the course.

The assessment also includes assessment of the faculty/teachers and the entire course. This is often accomplished using entrance and exit surveys of the students as well as the faculty and the administrative staff. The assessment

of the successful implementation of the course must also be inferred by the professional competence or successful performance of the students who have taken the course. This long-term assessment of the efficacy of a course appears to be the most useful in being able to determine educational impact, which is often quite difficult if not impossible.

The assessment of the remediation process should also be considered. If possible, performance and competence of individuals who have successfully completed the course at their first attempt could be compared to those who required remediation. A difference between those groups may suggest whether the remediation method of the course has been successful or may require revision.

The final evaluation of the course is critical for the future and what has worked and what needs to change. At the end of each course, some questions must be answered in order to improve the next year's program.

1. Was the course implemented as designed? Were there any differences between what was planned and what was realized?

2. Were the students satisfied with the content and the nature of the course? What were their perceptions in terms of course content, material, environment, faculty and assessment?

3. What was the performance of the learners? How many of the learning objectives did the students demonstrate competence?

4. What were the perceptions of the faculty? What were their perceptions in terms of content, environment, student performance and assessment?

5. What worked and may be repeated? What needs to be improved or changed?

DEVELOPING COURSE MATERIALS

The development of course materials often take a lot longer than the course itself and successful development of course materials is one key reason of success overall. Each course requires a syllabus, and the syllabus serves as a design document and provides all the necessary information to the student. Syllabus must be given to the students prior to the commencement of learning activities. Syllabus may have the following content: 1-title and description of the course, 2-learning objectives and rationale, 3- course content and student assignments, 4-target audience, 5-timetable and schedule, 6- course faculty, 7-course environment, 8-description learning materials and references, 9-grading and attendance criteria, 10-remediation, 11-references and other useful information.

Writing Learning Objectives: We will spend significant time in constructing learning objectives for course design. Writing learning objectives is no easy task, and there is no shortcut in creating simple yet perfect learning objectives

for a student group. Learning objectives must consider the educational needs, professional competence (what do you need to teach) the learners and their educational level (who needs to learn) and the time frame (when do the learners need to learn). Writing learning objectives follows the SMART principle: they should be specific, measurable, attainable, realistic and time bound. A specific learning objective starts with when the acquisition of the objective must be demonstrated. This could be at the end of a lecture, at the end of a course or at the end of the year.

- *At the end of this course, ….*

The next descriptor in the learning objective is the target student and this can be formulated as either the learner, participant, attendee or medical student.

- *At the end of this course, the medical student will be able to….*

The following statement will have to disclose the specific knowledge, behavior or skill the medical student must demonstrate. This is the specific learning objective you have designed

- *At the end of this course, the medical student will be able to take a radial pulse accurately….*

The learning objective can also have additional qualifiers. The first of these qualifiers would be the conditions provided to the learner in order to achieve the objective. These conditions may be using a textbook, computer, or may be restrictive such as without the use of a calculator or computer. Some learning objectives will not have additional qualifiers.

- *At the end of this course, the medical student will be able to take a radial pulse accurately without electronic instrumentation….*

Some qualifiers also define the degree of competence or the level of performance. These qualifiers may specify how accurate the student must be or specify internal or external standards or define a margin of error

- *At the end of this course, the medical student will be able to take a radial pulse accurately without electronic instrumentation and with no errors….*

Specific Learning Objectives: These are also known as enabling learning objectives and outline the knowledge, behavior or skill a student must acquire in order to achieve the overall course objective. These objectives are used to outline the scope of the content and are essential in identifying the educational format and material for the course. Specific learning objectives should make good examination questions and should be easily quantifiable or measurable (see above example). Specific learning objectives may be organized from simple to complex and from easy to implement to more elaborate.

Selection of Educational Format: The next critical question in the instructional design flowchart is the selection of the teaching method. Selection of the delivery method or the educational format defines the teaching materials necessary for that particular format. Choice of format is dependent on the learning objectives and is also influenced by the assessment strategy that will test the learning objective. Some questions must be answered in order to choose the appropriate educational format.

1. Is the educational format appropriate for the specific learning objectives of the course?
2. What is the projected number of learners?
3. What is the background of the learners?
4. Are the resources available and are special facilities required?
5. Are the faculty familiar with the educational format?
6. What is the assessment strategy for these learning objectives?

Selection of Exercises (practical sessions): The practical or hands-on section of the course program is typically the most popular and rewarding component, and it is wise to spend significant time in planning practical activities that will reinforce learning objectives and create an active learning environment. Problems (cases), series of questions, debates, interviews, role plays, and skill laboratories are all examples of exercises that can be programmed, based on the learning objectives and the availability of infrastructure. Combining a formative evaluation with the practical session and providing feedback soon after also allows better mastery of practical skills and gives a better chance for learning and improvement.

Selection of audiovisual and printed materials: Both audiovisuals and printed materials are vehicles for transmitting knowledge, to motivate or even excite learners to participate. While some consistency in the visual materials may allow the learner to adjust better, monotonous written or audiovisual material also runs the risk of losing learners' attention. There are no specific guidelines as to what type or how much material should be used in a course, and this is best decided by reviewing the learning objectives, the nature of the learners and the availability of learning materials.

Developing Course Schedule: A timetable with information on topics and lecturers may be sufficient for a schedule template, but the format for the course schedule should consider the complexity of elements. Typically, the schedule should include times, activities with corresponding objectives, educational formats and locations, teaching material required, technical support needed, resources and printed and audiovisual material. The schedule for course organizers is different from the course schedule shared with the learners.

Evaluation of Teaching and Learning: Course syllabus should clearly indicate how the students will be evaluated, how success or failure is determined as well as what will be the remediation in case of failure. To create a better

assessment strategy overall, a few points should be remembered:

- Always consider surveys as a means to understand perceptions. Administer a pre-course survey to determine the learners' expectations. Exit surveys should also be administered to learners as well as teachers.
- In addition to the pre-course survey, a pre-course examination, also known as pre-test, should be considered. This will allow you to assess the existing knowledge base of the learners.
- Formative tests during the course, allowing enough time for feedback and remediation are more effective than simple summative tests at the end of a course. While you may still want to administer a summative assessment at the end to determine success, formative assessments during the course allow the learner to improve and successfully complete the course.
- If appropriate, try to employ performance tests for skills taught during the course. This may be coupled with formative tests and given sufficient time, may be repeated later in the course.
- Use of videotapes during the course (if acceptable for learners and the teachers,) may provide additional valuable information in the evaluation of the course.
- Ensure that you have time to review and evaluate all the surveys and examinations to decide on the efficacy of the course and how much of the learning objectives have been achieved. This will allow you to ask whether you can improve these outcomes or even modify the course (objectives, formats, assessment methods) to improve the outcomes for the following years.

C. Large Group Teaching (Lectures)

Preparing a lecture is probably the most common activity among faculty members, and some faculty members find no reason to learn or improve themselves in their lecture design and presentations. Faculty members must be aware of the basic principles of didactic lectures and what should be done. Incorporating too many visuals, too much text, unrealistic list of learning objectives must be avoided. We all remember at least one or two lecturers who showed up for a 45-minute lecture with 200 slides and had to fly through every single one of them just to be able to show them to the audience. Today, most courses or conferences provide feedback to the presenter, so the lecturer with an unrealistic amount of visual material receives appropriate feedback and hopefully learns not to repeat the visual onslaught.

While we will discuss issues related to large group format teaching, especially lectures, this course and subsequent workshops at KAMER will aim at discouraging faculty to simply resort to didactic lectures, especially during clinical years. Faculty must remember that lectures are not appropriate teaching formats for behavior and skill related learning objectives, and while knowledge can be taught using interactive techniques, behavior and skills cannot be taught by lectures alone. Therefore, we will ask the participants of the course to think hard about changing their didactic lectures to other dynamic and interactive formats discussed in this course. When a lecture becomes unavoidable (and that is not at all that common), there are many ways to make a lecture more engaging for students.

1-you can start your lecture with a few questions and consider using an audience response system to make the students participate. You can choose your questions from the core learning objectives and also ask the same questions at the end to reinforce the core learning objectives

2-consider using an interactive format such as think-pair-share or snowball at the beginning of the lecture to engage the students

3-make sure you outline everything you will discuss at the beginning

4-use a summary slide to list the key learning objectives

5-NEVER EXCEED THE ALLOTTED TIME. As a rule of thumb, if you are using PowerPoint for a similar presentation, use 1 slide 1 minute rule, and do not use more than 6-7 lines per slide. A 45-minute presentation should not have more than 45 slides (the fewer the better)

6-your list of learning objectives need to be short enough to cover during the lecture. Having too many learning objectives for a lecture is a losing preposition

7-encourage questions and student comments anytime during the lecture and provide time for questions and discussions, thus the number of slides should be less than 1 per 1 minute if you wish to be interactive.

There are many helpful resources for preparing lectures and more information on how to make lectures more interactive and palatable to learners. Some helpful points for large group teaching design are listed below:

Prior to the lecture:

1. How will you formulate the purpose of the lecture clearly? Why do you need to give this lecture? What do the students need?
2. What will be your learning objectives, and the instructional goal (e.g. How can I teach the students to recognize normal heart sounds?)
3. What type of competencies will you cover? (Knowledge, behavior, skills)
4. What type of resources will you be using, and why?
5. What type of feedback will you get about your presentation from your peers or mentors?

During the lecture:

6. What questions should the learners be able to answer once they finish the lecture?
7. How will you attract and keep the student's attention?
8. How will you get the students to participate? What percentage of the lecture do you expect the student to talk or act? What percentage of the time will you talk?
9. What format will you use when presenting? What kind of visual aids and supporting materials will you use?
10. How will you summarize the key points in your lecture?
11. What type of teaching material, learning aid or references will you provide to the students

After the lecture:

12. What type of feedback will you obtain from the students? And how will you use this feedback?
13. How will you evaluate your performance and how well you achieved your learning objectives?
14. How will you re-assess the lecture content, teaching material and references? What type of improvements will you make?

TAKE HOME POINTS

- Taking account the knowledge of learners is critical
- Formulating SMART learning objectives is essential
- Students' attention and recall is best at the beginning and end of a lecture
- After 20 minutes there is a marked decline in attention
- Recall can be improved by changing the format of lecture every 20-25 minutes
- Active engagement can induce "deep" learning as opposed to "superficial" learning that is short-lived.

D. Small Group and Student-Centered Teaching

STRATEGIES FOR CONVERTING LECTURES INTO SMALL GROUP SESSIONS

It is quite probable that current faculty, especially senior faculty have gone through their medical/nursing training with the notion that lectures constituted the backbone of medical/nursing education. Unfortunately, there are still numerous medical/nursing schools around the world that still consider this statement relevant to their teaching strategy. However, the last few decades have provided significant advances in learning theory and practice, and numerous methods have been developed that are more effective in every way to didactic lectures. Studies have shown that students can retain and transfer information to new situations, when they are taught using active learning strategies. We know that learning implies building on existing knowledge, behavior or experiences and it must take into account the pre-existing concepts of the learner. Experiential theories have also shown the critical value of experience in adult learning. Effective learning is an active, social experience. These changes in our approach allowed teachers to challenge learners' misconceptions, facilitate discussion of the social and cultural implications and also give the responsibility to learn to their students. In most accrediting bodies, there are requirements for the medical school programs to include instructional opportunities for active learning and incorporate experience as the key element in the learning process.

Active learning occurs when the students do more than listening, and when they truly engage in the learning process by, reading, writing, discussing and experimenting. The active learning process often involves high-order intellectual tasks such as analysis, evaluation and synthesis.

So how can we harness the benefits of active learning? One of the ways to effectively change a lecture format to an active learning exercise is to select one of the tried-and-true methods of small group teaching activities. There are many elements one can incorporate into small group practices such as role play, think-pair-share, jigsaw method and so forth. The organization of small group activities can be accomplished through a series of basic steps and once established, they can be expanded or enriched with additional elements over the years.

Here are some of the basic steps in organizing a small group learning activity. Whatever you choose, your role as a lecturer must change first, and the teacher must learn to become a facilitator rather than a leader or a dictator (in its original meaning):

1. **Determine the learning objectives** that are related to one another either within an organ system or within biological systems. What is it that you want to teach?

2. **Determine the topic** and title based on the learning objectives. You may try identifying a group of related topics

that you can build an activity around.

3. **Identify resources and environment**: find out what you need, the class size, electronic hardware or software, supplies and availability of facilities.

4. **Establish the rules** of the session, group size, function of each individual in the group, rules about group dynamics, provide a set of instructions if necessary.

5. **Present the students with a task** prior to the small group session. Read an article, find the meaning of a list of terms, watch a YouTube video, observe a process, etc. The more exciting the task, the better the compliance (don't just give the students an article to read, push them to discover something in it!)

6. **Provide an introduction or guidance** for the session as well as tasks ahead. Give them a short introduction, or a set of questions, review the learning objectives at the beginning of the session

7. **Implement activity,** this could be a case study, analysis of an event or movie, discuss a decision or outcome, design or develop a novel solution. Set students to work with each other to accomplish a task.

8. **Monitor** the action of students, observe each group, bring groups together or split them apart to interact with each other (e.g. jigsaw method), allow the groups to interact with each other and give each other feedback. Identify a final product for each group to complete and share with other groups.

9. **Follow-up:** Ask for immediate feedback through elevator talks or one-minute papers, also you can ask the group to provide you with a product, such as a report or graphic demonstration. Review the concepts only if it is essential to do so. Provide feedback through formative assessment. Provide a summary of key issues. Remediate when necessary.

ROLE OF FACULTY AS A FACILITATOR IN SMALL GROUPS

The faculty member should first and foremost remember that small group exercises are not lectures, and no "lecturing" should be attempted. As a facilitator, the faculty should do the following:

● Introduce yourself, get to know the students, and discuss the goals of the exercise

● Define the structure of the groups and how each individual should work within groups

● Lay the groundwork, share the schedule and list expectations

● Allow the students to take charge and initiate discussions, team development, etc.

● Emphasize the importance of teamwork and communication as in "talking to each other".

● Trust and be trustworthy and learn to respect

- Do not prohibit confrontation, but make sure students know how to provide feedback appropriately

- DO NOT LECTURE, answer questions with a question, if at all possible, try to seek the answer from other students before providing the answer yourself

<div align="center">GUIDELINES FOR ORAL PRESENTATIONS IN SMALL GROUP SESSIONS</div>

Oral presentation skills are important to achieve before students begin interacting in small group session. It is often helpful to provide them with some guidelines and allow them to practice their presentation skills before coming to the session. We all need to be able to express our problems, ideas and grievances and the presentation of a patient's problem is not a simple laundry list of events or even a regurgitation of the information in the patient's medical chart. The oral presentation must be concise, precise and to the point. The presentation of the findings should allow everyone to reach a reasonable conclusion without the necessity of reviewing the chart for themselves. The faculty member should:

- Explain the need to practice oral presentations and present efficiently with confidence

- List the components and organization of a standard oral case presentation

- Differentiate between different types of presentations (new patient / daily rounds / interval visit outpatient, etc.)

- Identify the appropriate and inappropriate use of medical terminology and "jargon"

<div align="center">SPECIAL ARTICLE SUMMARY – TEAM BASED LEARNING</div>

The Essential Elements of Team-Based Learning

> Adapted from Chapter 1 of Michaelsen, L., Sweet, M. & Parmalee, D. (2009) *Team-Based Learning: Small Group Learning's Next Big Step*. *New Directions in Teaching and Learning*, 7-27.
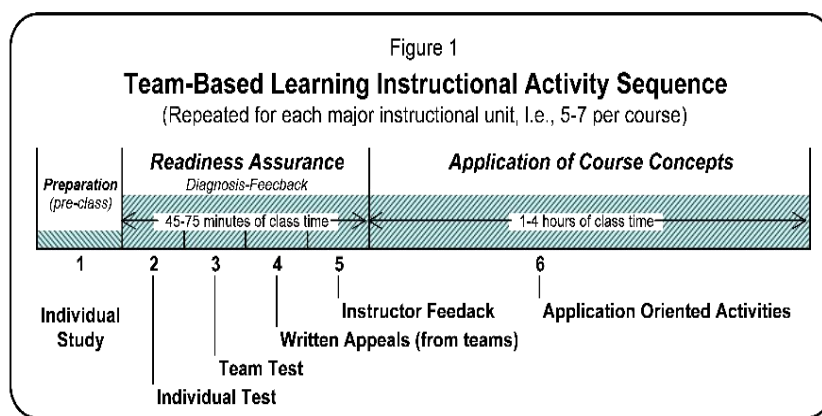
Team-Based Learning (TBL) probably relies on small-group interaction more heavily than any other commonly used strategy instructional in post-secondary education (e.g. for comparative discussion of different approaches, see Fink, 2002, 2004, Johnson, Johnson & Smith, 2007; Millis & Cottell, 1998, Michaelsen, Peterson & Sweet, 2009). This conclusion is based on three facts: First, with TBL, group work is central to both exposing students to and enhancing their ability to apply the course content. Second, with TBL, most of the class time is used for group work. Third, courses taught with TBL typically involve multiple group assignments that are specifically designed and sequenced to both improve learning and promote the development of self-managed learning teams.

This chapter begins with a very brief overview of TBL to ground readers in the basics so they can most benefit from

the detailed discussions that follow. Next, we discuss the four essential elements of TBL, and then walk through the steps required to implement TBL. Finally, we examine some of the benefits that students, administrators and faculty can expect from a successful implementation of TBL.

A Broad Overview of TBL

The primary learning objective in TBL is to go beyond simply "covering" content and focus on ensuring that students have the opportunity to practice using course concepts to solve problems. Thus, TBL is designed to provide students with both conceptual and procedural knowledge (e.g., Krathwohl, 2002) and, although some time in the TBL classroom is spent on ensuring that students master the course content, most of the class time is used for team assignments that focus on using course content to solve the kinds of problems that students are likely to face at some point in the future. Figure 1 outlines generally how time in one unit of a TBL course is organized. In a TBL course, students are strategically organized into permanent groups (for the entire term) and the course content is organized into major units (typically 5-7). Before *any* in- class content work,

Figure 1
Team-Based Learning Instructional Activity Sequence
(Repeated for each major instructional unit, I.e., 5-7 per course)

students must study assigned materials because each unit begins with the Readiness Assurance Process (RAP). The RAP consists of a short test (over the key ideas from the readings) which students first complete as individuals, then they take the exact same test again as a team, coming to consensus on team answers. Students receive immediate feedback on the team test and they then have the opportunity write evidence-based appeals if they feel they can make valid arguments for their answer to questions, which they got wrong. The final step in the RAP is a "lecture" (usually very short and always very specific) to enable the instructor to clarify any misperceptions that become apparent during the team test and the appeals. Once the RAP is completed, the remainder (and the majority) of the learning unit is spent on in-class activities and assignments that require students to practice *using* the course content.

The Four Essential Elements of Team-Based Learning

Shifting from simply familiarizing students with course concepts to requiring that students actually use those concepts to solve problems is no small task. Making this shift requires changes in the roles of both instructors and students. The instructor's primary role shifts from dispensing information to designing and managing the overall instructional process and the student's role shifts from being passive recipients of information to one of accepting

responsibility for the initial exposure to the course content so that they will be prepared for the in-class teamwork. Changes of this magnitude do not happen automatically and based on past experience, may even seem to be dreams rather than achievable realities. They are, however, highly reliable outcomes when the four essential elements of TBL are successfully implemented. These essential elements are:

● **Groups** - groups must be properly formed *and* managed,

● **Accountability** - students must be accountable for the quality of their individual *and* group work,

● **Feedback** - students must receive frequent *and* timely feedback, and

● **Assignment Design -** group assignments must promote both learning *and* team development.

When these four essential elements are implemented in a course, the stage is set for student groups to evolve into cohesive learning teams. This section briefly explores each of these elements.

PLEASE REFER TO APPENDIX A FOR THE FULL ARTICLE

1- First do no harm: The most harmful information to a patient is incomplete or inaccurate information that could lead to erroneous diagnosis and treatment, so one of the most critical attributes you need to acquire is "to know what you know and to know what you don't know". This is in essence the definition of competence, and the ability to do this allows you to become a competent physician

2- Practice, practice, practice: No one is born with presentation skills or public speech, contrary to what you hear, this is a learned behavior, and anyone can improve with practice. Performers of all kinds need to practice their skills to master them. You must practice your oral presentations and learn the presentation skills before you are asked to give a presentation of a real patient. You can practice alone or practice by presenting to a friend or colleague. You need to be able to say out loud what you plan to present and go through the entire presentation. You can even tape your presentations and listen to them to see if they give the message you intended to present.

3- Know the audience and their level: It is very important to know who will be listening to you since one of the cardinal rules of presentations is to start with a topic or part of a story where most of your audience will be able to follow. The same topic should be given to different audiences differently so find out who will be listening to you.

4- Know what is expected of you: You have to understand what it is that is being asked of you for an oral presentation. You should know exactly what the audience is expecting to hear. How much of the information is too simple or basic and how much of it is too complex for your audience? How long should the presentation be? What style are you expected to present, and should you plan for interruptions? One of the most important expectations for all presenters is to pay attention to TIME. Never exceed the time allowed for your presentation! No matter how interesting, once you exceed your time you will lose all the interest of the audience.

5- Speak clearly and with few abbreviations or colloquialism: Eliminate editorializing the findings too much, avoid unnecessary words like "ehm", "şey", "like" etc. etc. State the information clearly, concisely and precisely.

6- Use abbreviations only after describing them clearly, and only those familiar to the audience. Do not invent terms, new words or abbreviations. Use correct grammar and full sentences. Make sure you resonate every word, and do not fade out at the end of the sentence.

E. Giving/Receiving Feedback

Giving and receiving feedback is a key component of the professional learning process, and it is a complex interaction that is essential to academic development. For the feedback process to succeed and modify behavior and approach towards the positive, both the giver and the receiver of the feedback must be actively engaged and informed about the process. There are significant steps and approaches that the provider of the feedback must know and being educated on how to give feedback is critical for any faculty member. On the other side, the receiver of the feedback holds the true power in terms of whether he/she will interpret the information constructively and incorporate the feedback into daily practice. Our exercises will focus on both being able to give and receive feedback in an acceptable and constructive way so that the aftermath is not bitterness and scorn, but an active effort to improve the process. There are numerous approaches and the literature references provided in the syllabus are helpful resources in further understanding the process. We will briefly review some of these references in the classroom. First, we will define feedback as a FORMATIVE ASSESSMENT and is very much time-bound and almost always has a subjective component. Therefore, feedback must be as specific, descriptive, non-judgmental and constructive as possible.

A few suggestions for giving and receiving feedback in the academic setting are listed below:

Giving feedback:
- Make sure the receiver of the feedback clearly understands that you will be providing feedback specifically on a particular issue
- Allow sufficient time and make sure the location is appropriate, try to avoid distractions (i.e. do not take your cellphone with you and do not answer phone calls)
- While starting with a positive and alternating between positive and negative feedback may be viable, a more open and effective approach would be to begin with **listening**. You can try to focus the topic of the conversation to the specific issue, and should ask the receiver's opinion about how well things went, and what would have been better.
- Provide your take on what went well and what could be better, and you can always combine this assessment to avoid sounding too complimentary or too critical
- Try to find common goals to achieve and **focus on the *performance NOT the person.*** Do not make statements about personality attributes or generalize. It may sound cute to say "you are generally a very careful person" or "everybody likes you in this office" but such personalization must be avoided. Keep the entire conversation on the performance and not on the person. The implication is that you always assume the person can do better.

- Always try to make the person feel and understand that you are on the same side, and you are working together for the same goal.
- Allow the receiver to come up with solutions and suggestions. Then create a plan together

Receiving feedback:

- Turn off your cell phone, do not answer phone calls and prevent any other interruption until the feedback session concludes
- Listen before talking. Wait until the person giving the feedback opens up the conversation. Do not interrupt for any reason
- Be thankful, this is being done for your benefit and the person providing the feedback is on your side
- Make sure you understand the issues by summarizing what you are told. Confirm that you understand the issue
- If the provider's feedback is unbalanced, ask her/him to give you just one item that you can improve on.
- Make an improvement plan together with the provider

Additional reading material and information on giving and receiving feedback are provided in the recommended reading list. We will have some exercises and role plays in both giving and receiving feedback during the course.

F. Assessment of Learners

ASSESSMENT IN HEALTHCARE EDUCATION

Assessment in medical and nursing schools must be the evaluation of professional authenticity using well-defined learning objectives, and valid criteria. Typically, examinations attempt at grading on a rough scale or assigning a numerical value, but for formative examinations a simple judgment of sufficient/insufficient is also applicable. The purpose of summative assessment is to make a judgment about the level of skills or knowledge, to measure improvement over time, to evaluate strengths and weaknesses, to rank students for selection or exclusion, or to motivate. Assessment should be as objective, valid and reproducible as possible.

One can distinguish three types of *assessment*:

1. *Formative assessment* is testing that is part of the developmental or ongoing teaching/learning process. It always includes feedback to the student on his/her performance.

2. *Summative assessment* is aimed at a judgment of sufficiency, and often given at the end of a learning activity or a course. The main goals for summative assessment are to provide information about how much the student learned and how well the course was taught.

3. *Criterion-referenced assessment* refers to examinations against an absolute standard such as national or international qualifications. The exam tests an individual's performance against a current or historical benchmark.

Two concepts are critical in determining the value of an assessment: RELIABILITY and VALIDITY. A reliable test should produce the same or similar scores on two or more occasions or if given by two or more examiners. The validity of a test is determined by the extent to which it measures whatever it sets out to measure.

Reliability

Trust in the accuracy or provision of one's results; in the case of tests, it is an expression of the precision, consistency and reproducibility of measurements. Ideally, measurements should be the same when repeated by the same person or made by different assessors. In tests, contributing factors to reliability are the consistency of marking, the quality of test and test items, and the type and size of the sample. Satisfactory reliability of objective tests can be achieved by having large numbers of well-constructed test items marked by computer. Reliability is characterized by the stability, equivalence, and homogeneity of the test.

1. *Stability or test-retest reliability* is the degree to which the same test produces the same results when repeated under the same conditions;

2. ***Equivalence or alternate-form reliability*** is the degree to which alternate forms of the same measurement instrument produce the same result

3. ***Homogeneity*** is the extent to which various items legitimately team together to measure a single characteristic, such as a desired attitude.

In a clinical examination, obtaining reliability depends on three variables: the students, the examiners and the patients. Such complexity makes it difficult to reproduce a comparable situation for tests of clinical skill and clinical problem-solving. In a reliable assessment procedure, the variability due to the patient and the examiner should be removed. Wherever possible, a subjective approach to marking should be replaced by a more objective one and students should be tested by a number of examiners. It is important to note that students are usually examined using different patients, which may enhance the performance of some students and harm the performance of others. Therefore, tests which aim to assess clinical skills and clinical problem-solving have to contain many samples of student performance if they are to achieve adequate levels of reliability. The development of the multi-station objective structured clinical examination (OSCE) represents an effort to do so.

Validity

A term that reflects a solid foundation or justification for bringing the intended results. In the case of assessment, validity means the degree to which a measurement instrument truly measures what it is intended to measure. The establishment of validity is the first priority in developing any form of assessment. Without it, all other attributes are of little consequence. The assessment instrument should accurately represent the skills or characteristics it is designed to measure. Validity may be characterized in these four ways - content, concurrent, predictive or criterion-related validity:

1. ***Content validity*** is the one of greatest concern to teachers as the test must contain a representative sampling of the subject matter the student is expected to have learned. This sampling must be representative and should cross several categories of competence, a range of patient problems and a list of technical skills. Valid clinical examination should assess the components of clinical competence, including the ability to obtain from the patient a detailed and relevant history; carry out a physical examination of the patient; identify the patient's problems from the information obtained and reach a differential diagnosis; identify the appropriate investigations; interpret the results of the investigations; recommend and undertake appropriate management including patient education.

2. ***Concurrent validity*** considers the degree to which an assessment would produce the same results as another proven instrument (gold standard) which measures the same parameters.

3.	*Predictive validity* examines the degree to which an assessment method accurately predicts expected outcomes; for instance, an assessment of attitudes toward preventive care should correlate significantly with preventive care behaviors.

4.	*Criterion-related validity* includes concurrent validity as well as predictive validity and is a combination assessment that reviews both concepts.

Reproducibility of Assessment

Consistency in producing the same results if an assessment is repeated is a vital attribute of any test. It is important to know that if the same examinees were given the same test after some time and learned nothing in the interim, the same scores would result. Reproducibility is especially important in making licensure and certification decisions.

Objectivity refers to the general applicability of an examination, and its ability to test the learning objectives rather than the answers in an examiner's mind. The questions as well as the answers must be generally accepted facts and currently validated information. The questions should be accepted by other examiners and content experts as having high validity. Examination with question stems that have been constructed as if they are facts when they are in fact opinions, lack objectivity.

How to identify an effective examination: Some descriptions of an effective exam are listed below, in no particular order

• An effective examination reflects the time spent on lectures and should focus on critical concepts (core objectives). The questions on topics that were not covered during the learning process will not be perceived as fair and will not be effective. This will cause the learner to pay less attention to what is discussed during the learning activities and focus on the "exam" rather than learning activity

 • An effective examination should be an evaluative experience and a learning tool. The exam should function as a complete review of the key concepts of the course, enabling students to deepen their mastery of the topic.

• An effective examination should have clear, succinct and unambiguous question stems or tasks. It should not be confusing such that students have to read and re-read the question to clearly understand what is being asked.

• An effective examination strategy must consistently differentiate mastery levels by including learning objectives that are critical as well as less critical issues. The complexity of questions may vary and should always include higher-level questions that test deeper learning and being able to make meaningful associations with the topics.

• An effective examination must not have any surprises to a student who is well-prepared.

HOW DO DIFFERENT ASSESSMENT FORMATS PERFORM?

Written Interactive Test

Allows for assessment of clinical reasoning skills, understanding and knowledge of clinical and basic science and application of basic science to clinical problems. Test methods such as essays and open-ended interviews are used, providing information about the respondent's perceptions, attitudes, feelings, and experiences. Such tests should be designed to ensure that they are clinically coherent, containing questions from different disciplines, securing an appropriate discipline balance and ensuring that answers are reasonable expectations of students. However, these test methods are often subjective and may contain rater biases. Presently, to enhance their validity and reliability, most of the above-mentioned methods are computerized with the addition of various audiovisual inputs (computer-interactive tests).

Essays or Open-Ended Questions

An assessment method, distinguished from short-answer questions by the scope, the length of required answers, and the relative lack of specific cues for recall. Essay questions typically deal with larger issues and are based on information that is spread out over several learning sources. Students' answers should reflect both how much is known about a topic and how well-organized knowledge of the subject is. As essay questions and answers are comparatively complex, more abilities are displayed than with other question types. They may be used to assess knowledge of basic and clinical science and its application to clinical problems. They provide information about the respondent perceptions, reasoning abilities, attitudes, feelings, and experiences. The essential weakness of essay questions is that they can be ambiguous, difficult to grade reliably and require scorers with relevant knowledge and training. Most essay type exams lack the necessary reliability to be administered over a long period and to large student groups, unless the examination time is very long, and multiple scorers are utilized

Modified Essay Question (MEQ)

A measurement instrument which allows for assessment of clinical reasoning skills, understanding and knowledge of clinical and basic science and application of basic science to clinical problems. MEQ's constitute a series of questions which must be answered in the sequence asked, with no review and no possibility of correcting previous answers. Questions must be answered within the allocated time which may vary from 40 to 90 minutes. In general, a brief patient clinical scenario (presentation) is followed by a few questions exploring diagnostic hypotheses and mechanisms underlying the clinical presentation. Subsequent questions may focus on applied basic science, interpretation of diagnostic information, management issues, disease complications, ethical issues or prognosis, for example. The initial scenario is either repeated or reformulated as the reporting process progresses, and as further information is provided, the assessed area narrows. Thus, the medical problem is progressively defined with

questions being directed to increasingly specific areas. A well-written MEQ assesses the approach of students to a problem, their reasoning skills and understanding of concepts, rather than recall of factual knowledge.

Multiple Choice Questions (MCQ)

An assessment tool that requires examinees to identify the one correct answer to a question. It consists of a stem that directly or indirectly poses a question and a set of distracters from which the answer is selected. In its simplest form, it comprises a stem statement followed by related statements which an examinee marks as either true or false. The test reliability is achieved by formulating a large number of well-constructed questions; this requires considerable skill. The great strength of the multiple-choice format is its ease and reliability of scoring. Checking answers is mechanical and requires neither interpretation nor special knowledge. Most commonly administered multiple-choice exams are scored by machine and provide statistical information about the exam, such as item difficulty and item-test correlations. For these reasons, multiple-choice questions are popular among instructors offering the advantage of allowing different kinds of questions, at various levels of difficulty. The *computerized version of MCQ* can cover a large area of knowledge in a short space of time. And poor questions which fail to discriminate between candidates of different ability can be easily identified. Using a greater number of questions is beneficial, as a larger set of questions provides better coverage of course material, and students' test scores are more reliable. The correct answers are pre-specified and hence marking in some respects is objective. A large number of examinees can be tested with relatively few resources. The major disadvantage to multiple-choice questions is that they are time-consuming to construct. However, once constructed, multiple-choice questions can be used again, in either original or modified form. Since these tests primarily measure knowledge only, they are now often being replaced with more performance-based assessment methods.

Short-Answer Questions

An assessment tool that requires students to construct short, written answers to presented questions; often used instead of multiple-choice questions to have students actually recall the answer rather than merely select it from a set of alternatives. As the answers must be constructed, it is reasonable to assume that there is little chance of guessing correctly. The questions are therefore *cued-recall* measures of memory for course material whereas multiple-choice questions require only recognition. Although the stem (question) could be the same in both exam formats and the answer could be quite short, even a single word, the short-answer version is likely to be more difficult than the multiple-choice version. Because the short-answer questions require students to construct answers, they provide more information about the students' knowledge than the selection of a multiple-choice alternative. The disadvantage of this form of exam is related to grading. Question vagueness can yield interpretive problems, and even with quite clear questions, scoring requires assessors with relevant knowledge, judgment and time.

Clinical Oral Examination

While popular in many schools around the world, unstructured oral examinations have gradually been replaced by more standardized and structured alternatives. With face-to-face contact, the examiners can explore the depth of the student's understanding and approach. Many competencies including communication skills, professionalism as well as meta-skills such as analytical ability can be tested. Unstructured clinical oral examinations received significant criticism because of the reliability and the psychological stress that can be substantial. Increasing the number of examiners, use of videotapes, subsequent review of the recordings with the student and use of standardized scenarios may enhance the value of oral examination. However, increasingly standardized oral examinations may yield rigid examinations that are not more valid or reliable than written examinations. Training of examiners and constant monitoring with subsequent feedback may still render clinical oral examinations highly useful assessment tools.

Chart Stimulated Recall Oral Examination (CSR)

The examination method in which a real patient's chart is utilized. The exam uses the actual patient chart and creates a standardized oral examination by an experienced examiner. The examiner questions the learner about the care provided to the patients, asking the reasons for the tests ordered, diagnostic possibilities suggested, the laboratory test results' interpretation, treatment plan as well as adverse events. In a standard CSR, each patient chart review takes 5-15 minutes, and the learner is examined by one or (preferably) two examiners and the focus is given to reasoning and analysis, rather than knowledge.

Mini Clinical Examinations (mini-CEX)

The Mini-CEX is a 10- to 20-minute direct observation assessment or "snapshot" of a trainee-patient interaction. Faculty are encouraged to perform at least one per clinical rotation. To be most useful, faculty should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter (reference: www.abim.org). The mini-CEX is a method of the assessment of clinical skills including counseling skills and professionalism, developed by the American Board of Internal Medicine (Norcini et al. Ann Inter Med 1995; 123: 795–799), and has been used in clerkships as a feedback tool. After an evaluator observes a trainee's performance in a normal clinical encounter, the trainee receives immediate feedback. For each encounter, an examiner records specific predetermined parameters. Using an evaluation scale (unsatisfactory, satisfactory, above expected), the examiner rates the student on the predetermined competencies. The emphasis may be on one or more of the required competencies. After the interview, the examiner completes the rating form and provides feedback.

"The research literature on formative assessment and feedback suggests that it is a powerful means for changing the behavior of students and trainees. To enhance the efficacy of the methods of workplace-based assessment, it

is critical that the feedback which is provided be consistent with the needs of the learner, focus on important aspects of the performance (while avoiding personal issues), and have a series of characteristics which make it maximally effective. Since faculty play a key role in the successful implementation of formative assessment, strategies to provide training and encourage their participation are critical" (Norcini & Burch. AMEE Guide No. 31, Med Teach, 2007; 29:9-10, 855-871)

Direct Observation of Procedural Skills (DOPS)

This assessment method, developed in the UK, focuses on evaluating the procedural skills of postgraduate trainees by observing them in the workplace setting. Learners' performance is scored using a 6-point rating scale (below expected; borderline; meets expectations; above expectations. The assessment procedure is generally expected to require 15 minutes of observation time and 5 minutes dedicated to feedback. (Wragg et al. Clin Med 2003; 3: 131–134).

"Assessing learners in natural settings offers the opportunity to see beyond what they know and into what they actually do, which is fundamentally essential to training qualified physicians. Although the literature identifies several threats to its validity as an assessment, it also demonstrates methods to minimize those threats. Based on the current recommendations and need for performance assessment in education and with attention paid to the development and design, direct observation can and should be included in medical education curricula" (Fromme et al . Mt Sinai J Med 2009; 76:365–371).

Five Phases of Formative Assessment
1. Collect information about where students are in relation to desired learning objectives.
2. Identify gaps in knowledge/understanding/performance where further learning is required.
3. Create an assessment using checklists and observe performance on learning objectives. Grade performance
4. Discuss the assessment with the students. Offer objective, specific, improvement-oriented feedback to support remediation as soon as possible.
4. Allow sufficient time for students to act on feedback.
5. Require students to demonstrate progress towards desired learning objectives.

Providing immediate and effective feedback is the hallmark of formative assessment. This table describes the main steps in developing and applying an assessment tool and providing feedback immediately to observe progress. In many formative assessment methods, this assessment can be repeated as much as necessary until the student achieves the desired competencies or performance level. The assessment should test sufficient but limited number of learning objectives and should not be used to assess all the learning objectives in a particular course or curriculum.

Practicability of Assessment Procedures

As there are always restrictions on the resources available to conduct assessments, expertise and creativity are required to develop the best compromise between ideal and practical solutions and assessment methods. You need time and resources to develop an effective assessment strategy that evaluates how the student will perform in real life, and the strategy must possess acceptable standards of validity and reliability. This applies particularly to the assessment of clinical skills where much longer or more frequent observations of student performance are required than are usually undertaken in preclinical courses. The planning of exams should consider the infrastructure and the number of students to be assessed. An assessment procedure appropriate for 20 students may not be practical when 100-200 students need to be evaluated. Important factors are the number of staff available, their expertise, number of available patients (standard or real), available space or accommodation and technology. The purpose of the assessment is also critical in determining what type of test to choose. If results are used to determine "pass or fail" status a summative assessment is appropriate. However, if the goal is to probe areas in which students are deficient and to remedy such deficiencies, then a formative assessment must be selected.

STAGE 1- CHECKLIST   **LEARNER NAME:**_____

	TO BE FULLY COMPLETED PRIOR TO ADVANCEMENT TO STAGE 2		
1) Assignment	**2)Description**	**3) Date Submitted**	**4) Date Accepted**
Design a Lecture			
Evaluate a Lecture			
Design a Small Group Activity			
Presentation on Giving and Receiving Feedback			
Propose an Assessment Strategy for a Learning Activity			
NOTES: Please provide a detailed description of each assignment including title, dates, individuals involved and reference to the written document you have turned in for credit. Dates submitted and accepted will be completed by your tutors. DO NOT WRITE ANTHING ON COLUMNS 3 AND 4.			

EVALUATION (OVERALL): ☐**Outstanding***   ☐**Sufficient***   ☐**Needs Remediation**
                       * Eligible for certification

Strengths:

Weaknesses:

Evaluator: _____   Date:_____

RECOMMENDED READING: Also refer to AMEE guides for a variety of educational topics
https://amee.org/shop/publications/amee-guides

REFERENCES

1. Rafi A, Anwar MI. Challenges for implementing WFME standards for accreditation in health professions education in low and middle-income countries: A scoping review. *J Pak Med Assoc.* Mar 2021;71(3):966-976.
2. Wijnen-Meijer M, Burdick W, Alofs L, Burgers C, ten Cate O. Stages and transitions in medical education around the world: clarifying structures and terminology. *Med Teach.* Apr 2013;35(4):301-307.
3. Glasper A. NMC launches new standards for undergraduate nurse programmes. *Br J Nurs.* Nov 11-24 2010;19(20):1308-1309.
4. Engelbrecht R, Ingenerf J, Reiner J. Educational standards -- terminologies used. *Stud Health Technol Inform.* 2004;109:95-113.
5. Wojtczak A. Medical education terminology. *Med Teach.* Jul 2002;24(4):357.
6. Chen W, Kleinheksel AJ. Six ways to get a grip on leveraging the expertise of Instructional Design and Technology professionals. *Can Med Educ J.* Jun 2021;12(3):142-146.
7. Yuliawan D, Widyandana D, Nur Hidayah R. Utilization of Nursing Education Progressive Web Application (NEPWA) Media in an Education and Health Promotion Course Using Gagne's Model of Instructional Design on Nursing Students: Quantitative Research and Development Study. *JMIR Nurs.* Jan-Dec 2020;3(1):e19780.
8. Rajeh N, Grant J, Farsi J, Tekian A. Contextual Analysis of Stakeholder Opinion on Management and Leadership Competencies for Undergraduate Medical Education: Informing Course Design. *J Med Educ Curric Dev.* Jan-Dec 2020;7:2382120520948866.
9. Onyura B, Baker L, Cameron B, Friesen F, Leslie K. Evidence for curricular and instructional design approaches in undergraduate medical education: An umbrella review. *Med Teach.* 2016;38(2):150-161.
10. Schaefer JJ, 3rd, Vanderbilt AA, Cason CL, et al. Literature review: instructional design and pedagogy science in healthcare simulation. *Simul Healthc.* Aug 2011;6 Suppl:S30-41.
11. Queally JM, Kiely PD, O'Daly BJ, O'Byrne JM. Design and implementation of a system-based course in musculoskeletal medicine for medical students. *J Bone Joint Surg Am.* May 2009;91(5):1276-1277; author reply 1277.
12. Lockyer J, Ward R, Toews J. Twelve tips for effective short course design. *Med Teach.* Aug 2005;27(5):392-395.
13. Sanddal ND. Instructional design: the format for performance. *EMT J.* Feb 1981;5(1):54-56.
14. Siracusa F, Boichuk A. Medical education fit for the 21st century: A response to "the lecture-free curriculum: Setting the stage for life-long learning". *Med Teach.* May 2021;43(5):606.
15. Asghar S, Rahman S, Shaikh S, Aslam S, Karania T. Medical students' perspective on 'effects of seminar teaching method versus lecture-based learning in medical education: A meta-analysis of randomized controlled trials'. *Med Teach.* Jan 18 2021:1-2.
16. Yiu SHM, Spacek AM, Pageau PG, Woo MYC, Curtis Lee A, Frank JR. Dissecting the Contemporary Clerkship: Theory-based Educational Trial of Videos Versus Lectures in Medical Student Education. *AEM Educ Train.* Jan 2020;4(1):10-17.
17. Timmer MCJ, Steendijk P, Arend SM, Versteeg M. Making a Lecture Stick: the Effect of Spaced Instruction on Knowledge Retention in Medical Education. *Med Sci Educ.* Sep 2020;30(3):1211-1219.
18. Tusa N, Sointu E, Kastarinen H, et al. Medical certificate education: controlled study between lectures and flipped classroom. *BMC Med Educ.* Oct 24 2018;18(1):243.
19. Tang B, Coret A, Qureshi A, Barron H, Ayala AP, Law M. Online Lectures in Undergraduate Medical Education: Scoping Review. *JMIR Med Educ.* Apr 10 2018;4(1):e11.
20. Sandelowsky H, Krakau I, Modin S, Stallberg B, Johansson SE, Nager A. Effectiveness of traditional lectures and case methods in Swedish general practitioners' continuing medical education about COPD: a cluster randomised controlled trial. *BMJ Open.* Aug 10 2018;8(8):e021982.
21. Ikonne U, Campbell AM, Whelihan KE, Bay RC, Lewis JH. Exodus From the Classroom: Student Perceptions, Lecture Capture Technology, and the Inception of On-Demand Preclinical Medical Education. *J Am Osteopath Assoc.* Dec 1 2018;118(12):813-823.
22. Cooper AZ, Richards JB. Lectures for Adult Learners: Breaking Old Habits in Graduate Medical Education. *Am J Med.* Mar 2017;130(3):376-381.
23. Alluri RK, Tsing P, Lee E, Napolitano J. A randomized controlled trial of high-fidelity simulation versus lecture-based education in preclinical medical students. *Med Teach.* 2016;38(4):404-409.
24. Pugh CM, Arafat FO, Kwan C, et al. Development and evaluation of a simulation-based continuing medical education course: beyond lectures and credit hours. *Am J Surg.* Oct 2015;210(4):603-609.
25. Prober CG, Heath C. Lecture halls without lectures--a proposal for medical education. *N Engl J Med.* May 3 2012;366(18):1657-1659.
26. Manzoor I, Mumtaz A, Habib M, Tariq S, Elahee M, Javaid I. Lectures in medical education: students' views. *J Ayub Med Coll Abbottabad.* Oct-Dec 2011;23(4):118-121.
27. Carrero EJ, Gomar C, Fabregas N, Penzo W, Castillo J, Villalonga A. [Problem/case-based learning compared to lectures for acquiring knowledge of air embolism in continuing medical education]. *Rev Esp Anestesiol Reanim.* Apr 2008;55(4):202-209.
28. van Diggele C, Burgess A, Mellis C. Planning, preparing and structuring a small group teaching session. *BMC Med Educ.* Dec 3 2020;20(Suppl 2):462.
29. Uppal V, Uppal N. Flipped jigsaw activity as a small group peer-assisted teaching learning tool in Biochemistry Department among Indian Medical Graduate: An experimental study. *Biochem Mol Biol Educ.* Jul 2020;48(4):337-343.
30. Roshni M, Rahim A. Small group discussions as an effective teaching-learning methodology for learning the principles of family medicine among 2(nd)-year MBBS students. *J Family Med Prim Care.* May 2020;9(5):2248-2252.

31. Mir MM, Jeelani M, Alshahrani MS. A practical approach for successful small group teaching in medical schools with student centered curricula. *J Adv Med Educ Prof.* Jul 2019;7(3):149-153.

32. Nathaniel TI, Gainey JC, Williams JA, et al. Impact and educational outcomes of a small group self-directed teaching strategy in a clinical neuroscience curriculum. *Anat Sci Educ.* Sep 2018;11(5):478-487.

33. Gavriel J. Teaching tips for small-group facilitation. *Educ Prim Care.* Mar 2015;26(2):102-104.

34. Kim S. How to apply small group teaching method. *Korean J Med Educ.* Jun 2014;26(2):83-86.

35. Meo SA. Basic steps in establishing effective small group teaching sessions in medical schools. *Pak J Med Sci.* Jul 2013;29(4):1071-1076.

36. Magrane D, Khan O, Pigeon Y, Leadley J, Grigsby RK. Learning about teams by participating in teams. *Acad Med.* Aug 2010;85(8):1303-1311.

37. Edmunds S, Brown G. Effective small group learning: AMEE Guide No. 48. *Med Teach.* 2010;32(9):715-726.

38. Schmidt CN, Abdullahi A, Kryzhanovskaya IV. Giving and receiving feedback: A student-informed curriculum. *Med Educ.* May 2021;55(5):638.

39. Lam DL, Sarkany DS, Whitman GJ, Straus CM. It's a Two-Way Street: Giving and Receiving Feedback to the Unaware. *Curr Probl Diagn Radiol.* Jul 5 2021.

40. Jug R, Jiang XS, Bean SM. Giving and Receiving Effective Feedback: A Review Article and How-To Guide. *Arch Pathol Lab Med.* Feb 2019;143(2):244-250.

41. Tekian A, Watling CJ, Roberts TE, Steinert Y, Norcini J. Qualitative and quantitative feedback in the context of competency-based education. *Med Teach.* Dec 2017;39(12):1245-1249.

42. Kowalski K. Giving and Receiving Feedback: Part I. *J Contin Educ Nurs.* Sep 1 2017;48(9):395-396.

43. Kowalski K. Giving and Receiving Feedback: Part II. *J Contin Educ Nurs.* Oct 1 2017;48(10):445-446.

44. Shirey MR. Giving and receiving feedback. *J Contin Educ Nurs.* Jun 2012;43(6):243-244.

45. Norcini J. The power of feedback. *Med Educ.* Jan 2010;44(1):16-17.

46. Baile WF, Buckman R, Lenzi R, Glober G, Beale EA, Kudelka AP. SPIKES-A six-step protocol for delivering bad news: application to the patient with cancer. *Oncologist.* 2000;5(4):302-311.

47. Norcini JJ, Blank LL, Arnold GK, Kimball HR. The mini-CEX (clinical evaluation exercise): a preliminary investigation. *Ann Intern Med.* Nov 15 1995;123(10):795-799.

48. Friedman Ben David M, Davis MH, Harden RM, Howie PW, Ker J, Pippard MJ. AMEE Medical Education Guide No. 24: Portfolios as a method of student assessment. *Med Teach.* Oct 2001;23(6):535-551.

49. Kogan JR, Bellini LM, Shea JA. Implementation of the mini-CEX to evaluate medical students' clinical skills. *Acad Med.* Nov 2002;77(11):1156-1157.

50. Norcini JJ. Work based assessment. *BMJ.* Apr 5 2003;326(7392):753-755.

51. Norcini JJ. Setting standards on educational tests. *Med Educ.* May 2003;37(5):464-469.

52. Amin Z, Chong YS, Khoo HE. Towards better practices in medical student assessment. *Ann Acad Med Singapore.* Sep 2005;34(8):471-472.

53. Hauer KE, Hodgson CS, Kerr KM, Teherani A, Irby DM. A national study of medical student clinical skills assessment. *Acad Med.* Oct 2005;80(10 Suppl):S25-29.

54. Alves de Lima A, Barrero C, Baratta S, et al. Validity, reliability, feasibility and satisfaction of the Mini-Clinical Evaluation Exercise (Mini-CEX) for cardiology residency training. *Med Teach.* Oct 2007;29(8):785-790.

55. Norcini J, Burch V. Workplace-based assessment as an educational tool: AMEE Guide No. 31. *Med Teach.* Nov 2007;29(9):855-871.

56. Norcini JJ, McKinley DW. Assessment methods in medical education. *Teaching and Teacher Education.* 2007;23(3):239-250.

57. Chander B, Kule R, Baiocco P, et al. Teaching the competencies: using objective structured clinical encounters for gastroenterology fellows. *Clin Gastroenterol Hepatol.* May 2009;7(5):509-514.

58. De Champlain AF. Setting and maintaining standards in multiple-choice examinations: guide supplement 37.2 - viewpoint. *Med Teach.* 2010;32(5):436-437.

59. Hussein A, Abdelkhalek N, Hamdy H. Setting and maintaining standards in multiple choice examinations: Guide supplement 37.3--practical application. *Med Teach.* 2010;32(7):610-612.

60. Pell G, Fuller R, Homer M, Roberts T, International Association for Medical E. How to measure the quality of the OSCE: A review of metrics - AMEE guide no. 49. *Med Teach.* 2010;32(10):802-811.

61. Norcini J, Anderson B, Bollela V, et al. Criteria for good assessment: consensus statement and recommendations from the Ottawa 2010 Conference. *Med Teach.* 2011;33(3):206-214.

62. Tavakol M, Dennick R. Post-examination analysis of objective tests. *Med Teach.* 2011;33(6):447-458.

63. Hochlehnert A, Brass K, Moltner A, et al. Good exams made easy: the item management system for multiple examination formats. *BMC Med Educ.* 2012;12:63.

64. Singh T. Student assessment: issues and dilemmas regarding objectivity. *Natl Med J India.* Sep-Oct 2012;25(5):287-290.

65. Khan KZ, Gaunt K, Ramachandran S, Pushkar P. The Objective Structured Clinical Examination (OSCE): AMEE Guide No. 81. Part II: organisation & administration. *Med Teach.* Sep 2013;35(9):e1447-1463.

66. Rauf A, Shamim MS, Aly SM, Chundrigar T, Alam SN. Formative assessment in undergraduate medical education: concept, implementation and hurdles. *J Pak Med Assoc.* Jan 2014;64(1):72-75.

67. Tekian A, Hodges BD, Roberts TE, Schuwirth L, Norcini J. Assessing competencies using milestones along the way. *Med Teach.* Apr 2015;37(4):399-402.
68. Tekian A, Norcini J. Overcome the 60% passing score and improve the quality of assessment. *GMS Z Med Ausbild.* 2015;32(4):Doc43.
69. Seo JH, Kong HH, Im SJ, et al. A pilot study on the evaluation of medical student documentation: assessment of SOAP notes. *Korean J Med Educ.* Jun 2016;28(2):237-241.
70. (SOMAC) KUSoMAC. Koç University School of Medicine Assessment Committee Operational Guidelines-revision. 2017:1-8, Sariyer, Istanbul.
71. Lorwald AC, Lahner FM, Nouns ZM, et al. The educational impact of Mini-Clinical Evaluation Exercise (Mini-CEX) and Direct Observation of Procedural Skills (DOPS) and its association with implementation: A systematic review and meta-analysis. *PLoS One.* 2018;13(6):e0198009.
72. Norcini J. The MRCGP Clinical Skills Assessment: an international perspective of evidence. *Educ Prim Care.* May 2018;29(3):138.
73. Norcini J, Anderson MB, Bollela V, et al. 2018 Consensus framework for good assessment. *Med Teach.* Nov 2018;40(11):1102-1109.
74. Sajjad M, Khan RA, Yasmeen R. Measuring assessment standards in undergraduate medical programs: Development and validation of AIM tool. *Pak J Med Sci.* Jan-Feb 2018;34(1):164-169.
75. Norcini J. What's Next? Developing Systems of Assessment for Educational Settings. *Acad Med.* Nov 2019;94(11S Association of American Medical Colleges Learn Serve Lead: Proceedings of the 58th Annual Research in Medical Education Sessions):S7-S8.
76. Egarter S, Mutschler A, Tekian A, Norcini J, Brass K. Medical assessment in the age of digitalisation. *BMC Med Educ.* Mar 31 2020;20(1):101.