Commentary

CLINICAL INVESTIGATION

Micro skills in medical teaching

Abstract

Teaching is a complicated process that consists of educating and rehabilitating the learner to face the life with an open mind and a strong background of right ideas and productive way of thinking. I require the teacher to be aware of psychology, mental health and healthy education. New micro skills in medical teaching are developed to achieve the teaching goals in a simple, easy and recent ways. We will discuss some microskills used in medical teaching, starting by the hidden curriculum.

Keyword: Psychology • Ontology • Tumours • Micro-skills

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Borayek Saad*

Harvard Alumni Egyptian Fellowship Trainer, Egypt

Author for correspondence: abojo920@gmail.com

Introduction

In contrast with the formal curriculum, such as the courses, exercises, exams and activities students participate in, a hidden curriculum can be defined as the lessons that are taught indirectly and usually unintentionally in the education system, such as behaviors, perspectives, and attitudes that students pick up while they are at the education environment [1]. How to deal with the patients, how to react with the relatives, how to respond with the emergencies, what are the goals and objectives of the job? These attitudes and ideas aren't taught in any formal way, but residents absorb and internalize them through natural observation and participation in operating room and social activities [2].

Concept maps

A concept map is a diagram that draws suggested relationships between concepts[3]. Concept maps are used by teachers to organize and structure knowledge. Mechanism maps are some sort of concept maps. In mechanism maps, there is a consequence between actions and findings in a logic way that correlates these things as a result or a cause of each other [4,5].

Concept maps can stimulate the generation of ideas, aid creativity, communicate complex ideas and make brain storming[6]. Formalized concept maps are used in software design can also be seen as a first step in ontology-building and can also be used flexibly to represent formal argumen (argument maps).

Concept maps are widely used in education

Ues include:

- Note taking and summarizing the key concepts.
- New knowledge creation.
- Data preservation.
- Knowledge modeling.
- Creation of shared vision and shared understanding.
- Knowledge design.
- Providing the strategic objectives, to training goals.
- Communicating ideas.
- Examining the ideas.
- Detailing the entire structure of an idea or thought.
- Enhancing metacognition (learning to learn, and thinking about thinking).
- Improving language ability [7].
- Assessing learner understanding of learning objectives, concepts, and the relationship among those concepts.

Here are four main types of concept maps

- Spider maps, or spider diagrams, are a type of concept map that looks like a spider; the idea is in the center of the map, and the aspects of the object branches from it like the spider. This type work best when exploring various facets of one central concept. This can help in studying many subtopics of the main object.
- Flowcharting, a linear structure that leads reader through the information step-by-step by visual representation. It can be used in education to simplify memorizing a complex object.
- System mapping, this focuses on the relationships between ideas and are often used to record and organize thoughts that interact within a defined environment or ecosystem, such as the relations between signs and symptoms of septic shock.
- Hierarchy mapping, the main idea or concept is at the top of the map, with lower-ranking ideas flowing underneath. This can be represented by the concept map of types of breast cancer [8,9].

How to make a concept map

Creating concept maps is easy. Start by identifying a concept or an idea at the top, then, using lines and arrows, add information that flows from the main concept. You can follow these steps for making a concept map:

- Identify your main topic, this should be a broad concept with many subtopics to explore. This main idea will be at the top or center of your concept map and guide its hierarchical structure. eg. What are the types of brain tumours.
- Identify key concepts, these are the first layer of information branching off from your main topic. e.g Soft tissue tumours, meningeal tumours, vascular tumours, cerebellar tumours, nerve tissue tumours.
- Organize and connect the key concepts starting with the broadest ideas that connect directly to your main idea using linking words to establish the relationship between different concept [9].
- Formatting and fact-checking of the map, be sure your linking words make sense, and make cross-links to connect concepts in different areas of your map.
- Revision of concept map, edit or add to your concept map whenever you think of a new idea, it is a dynamic process that can grow by generating more ideas [10].

Benefits of concept mapping

Concept maps are a great tool for idea exploration and visualization, there are some advantages that make concept mapping better than other brainstorming methods and tools:

- Concept maps help seeing the big picture when studying a complex topic; it protects the learner from forgetting the big picture when he dives into the details.
- Concept mapping is visual by nature, it can increase the visual memory retention helping visual learners participate and thrive.
- Concept maps organize ideas, breaking down complicated concepts into smaller pieces, making it easier to fractionate and understand complex ideas. Concept maps can generate ideas present them in a dynamic, connected way.
- Concept mapping helps teams generate ideas from diverse contributors who each bring their unique and valuable perspectives to the table.

Flipped classroom

Flipped classroom is an instructional strategy and a type of blended learning which changes the order of classical teaching process to an opposite order. In flipped classroom, the lectures, researches and online discussions are carried out by the learners at home, while they discuss and exercise the concepts at the classroom with a mentor supervision. This strategy aims to increase learner engagement and sharing by having learners complete readings at home and work on live problem-solving during class time.

- Get a commitment: ask the learner to formulate his/her own diagnosis or plan.
- Ask for supporting evidence and evaluate the learner's knowledge or reasoning.
- Teach the learner the general rules that are the "take-home points" that can be used in future cases, aiming at treating an area of weakness for the learner.
- Provide positive feedback by reinforcing what was done well.
- Provide constructive feedback by correcting errors with recommendations for improvement.

Assessment

Formative assessment is repeatedly done and it aims at improving the knowledge and skills of the students. So formative assessment is assessment "for" learning and it is more important for the learners than summative assessment. Whereas summative assessment is assessment "of" learning, and is used for grading.

As regard reliability, there is the inter observer reliability method, and it considers the test reliable if the scores of another test done by another observer is identical or similar to the results of the same test. Also, there is the test-retest reliability method and it considers the test reliable if the results are identical or similar to the results of the same test when given again, or similar to another similar test given to the same learners.

As regard validity, there is the predictive validity method, it considers the test valid if the results of the test can help predict the performance or behavior of the learners in a relevant future measure. Multiple choice question is a form of an objective assessment in which learners are asked to select only correct answers from the choices offered as a list. The multiple-choice system is most frequently used in educational testing and in surveys.

E. L. Thorndike and his assistant Benjamin D. Wood were the first educators who developed the multiple-choice test. However, Christopher P. Sole created the first multiple-choice examination for computers on a Sharp Mz 80 computer in 1982. MCQ's testing gained more popularity after developing scanners and data-processing machines to check the results.

Multiple choice items consist of a stem and several alternative answers. The stem is a question to be answered, a problem to be solved, or an incomplete statement to be completed. The choices are the possible answers that the examinee can choose from. The correct answer is called the key and the incorrect answers are called distractors. Only one answer or more than one answer may be keyed as correct. A correct answer earns a point toward the total mark, and an incorrect answer earns nothing. However, tests may also award partial credit for unanswered questions or penalize students for incorrect answers, to discourage guessing.

For advanced items, such as in postgraduate medical exams, the stem can consist of multiple parts, such as a vignette, a case study, a graph, a table, or a detailed description of a case or a problem. Anything may be included as long as it is necessary to ensure the complete validity and reliability to the item. The stem ends with a lead-in question explaining how the examinee must answer. In a medical multiple-choice items, a lead-in question may ask "What is the most likely diagnosis?", "What is the next management step?" or "What pathogen is the most likely cause?" in reference to a case study that was previously presented in the stem.

A well written multiple-choice question avoids obviously wrong or impossible distractors, so that the question makes sense when read with each of the distractors as well as with the correct answer randomized in between.

When the items are well-written, emphasizing the quality, validity and reliability, the MCQ's can be a very effective assessment technique. Examinees' performance can be improved if they are correctly oriented about the format of the MCQ's items (questions). Reliability can be improved by increasing the numbers of items on a test, and with good sampling and specificity emphasizing. Overall test reliability can be further increased. Also, MCQ's examinations require less time as compared to essay examinations.

MCQ's exams do not require a teacher to interpret answers; the examinees are graded solely according to their selections, so, achieving a lower likelihood of teacher bias in the results. Also, the test-taker is graded purely on their knowledge of the topic, regardless to irrelevant factors (like writing skills or presentation clarity). Compared with essay exams, oral exams, simulation games, or activity participation, multiple choice tests are the strongest predictors of student performance. However, MCQ's exams are not suitable for testing high cognitive skills like reasoning or problem solving.

Another disadvantage of the MCQ's assessment tool is that the examinee may choose the correct answer by "guessing" or by chance, we can reduce this probability if we give a negative credit for the wrong answer, then the student will not answer by chance or by guessing. Again, we can make multiple choices for the single item, to decrease the possibility of correct guesses. Also, MCQ's exams don't test the "partial" knowledge of the test taker, they either gain the full credit of the question or not. However, it is the most convenient assessment system in large numbers faculties.

We must write the item in a clear way, avoiding ambiguous phrases that may confuse the test-taker and push them to a wrong selection. If the question has more than a correct answer, we should point to this at the beginning, and show this permission to the examinees.

Philosopher and education proponent Jacques Derrida said: "While the demand for dispensing and checking basic knowledge is valid, there are other means to respond to this need than resorting to crib sheets". But although these critics, MCQ's are easy to create, use, score and analyze, so this assessment tool remains the most popular, especially in large numbers examinees. We advise the examinees to feel free changing their first instinct. The data across twenty separate studies indicate that the percentage of "right to wrong" changes is 20.2%, whereas the percentage of "wrong to right" changes is 57.8%, nearly triple. Some test takers for some examination subjects might have accurate first instincts about a particular test item, but that does not mean that all test takers should trust their first instinct. Sometimes, the initial attraction to a particular choice may derive from surface affection that the examiner has intentionally built in the item or the distract or, so, more test-takers change their choices from wrong to right after additional reflection, revision and rethinking about the topic.

Think-pair-share

Think-pair-share is three steps collaborative teaching strategy used to help learners form individual ideas about a concept, discuss with colleagues and share with the others in-group. This teaching strategy can be used before reading or teaching a concept, and works better with smaller groups. In think-pair-share strategy, the teacher acts as a facilitator, and poses a question or a problem to the students. The students are given sufficient time to think and gather their thoughts in groups of two or three members, then each learner is allowed to share his ideas with the big group.

As the students begin to share their thoughts and views, each learns to observe the different views of thinking among their colleagues. By doing so, the learning is enhanced by the formation and articulation of an idea. This also enables the learners to have clarity of thought and have the ability to communicate their thoughts and ideas to their peers.

Think-pair-share is designed to help the learner to

understand the concept of the given topic, develop his ability to filter the information and formulate an idea or thought, and draw conclusions. The most important result of the think-pair-share strategy is that the learners will develop the ability to consider and appreciate the different viewpoints of their colleagues.

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