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Second Edition

Tejinder Singh
Anshu

Principles of ASSESSMENT IN MEDICAL EDUCATION



Forewords
John Dent
Lambert Schuwirth

JAYPEE

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Chapter 3

Assessment of Knowledge: Free Response Type Questions

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KEY POINTS

- Knowledge forms the base of clinical competence and should be given due emphasis.
- What is asked is more important than how it is asked.
- Essay questions and their variants help in assessing knowledge beyond recall of facts.

Miller pyramid for assessing clinical competence (Miller, 1990) has already been discussed in Chapter 2. The base of the pyramid is formed by knowledge (*knows*) and understanding (*knows how*). As we move toward the top of the pyramid, we find that testing performance in controlled settings (shows how) and in realistic situations (does) take priority. In the last decade we have seen the traditional methods of assessment in medical education being replaced by more sophisticated strategies. There is a trend to move from assessment of knowledge toward assessment of clinical competence. Are knowledge and competence two watertight compartments, separate from each other? Are these terms mutually exclusive? Or are they interlinked? Can a student perform competently without knowledge of a subject?

There are some issues about assessment of competence that need to be clarified here. Miller's model is pyramidal in shape—which implies that a student needs to 'know' before he 'knows how'; and that he needs to 'know how' before he can 'show how' or actually perform in a real-life situation. However, what is more important here is that this relationship is non-linear. In other words, while it is difficult to climb up the pyramid without completing the lower step; attainment of a step does not mean that the lower step has been automatically completed. The implications for us are therefore clear. One, we cannot test clinical competence without assessing knowledge. And two, merely knowing will not guarantee application. It also follows that assessment of clinical competence needs to happen at each level. It is important to realize

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that knowledge forms the base or the foundation of the pyramid **(*see* Fig. 2.1)**. If the foundation is weak, the upper levels cannot be strong. Testing knowledge is thus an important component of our teaching which cannot be ignored, for it is the very foundation on which clinical competence is based.

There is ample research evidence to suggest that assessment of knowledge is integral to assessing clinical competence. Knowledge has been shown to be the best predictor of clinical competence. In addition, it shows best correlation with acquisition of practical skills.

It may also be useful to clarify that knowledge can occur in various forms. Eraut (1985) has distinguished between Type A and Type B knowledge. Type A or *declarative* knowledge is the knowledge, which is from published sources, which can be verified and includes information on how to carry out skills (although it does not include actually performing those skills). Type B knowledge, which includes knowledge of processes and skills, comes out of personal experience and includes *procedural* and process knowledge. We see no conflict of this terminology with Miller pyramid. Type A knowledge can be equated with the 'knows' level of Miller, while type B knowledge can be equated with the 'knows how' and 'shows' levels. This further strengthens our original position that assessment of knowledge at any level is crucial to form valid interpretation about clinical competence.

This concept is also well illustrated by Newble's model for clinical competence (Newble, 1992). Clinical competence requires mastery of relevant knowledge, proficiency in skills (including interpersonal, technical, clinical and communication skills), development of the right attitudes, all of which are inter-related. All of these play a role in clinical performance and affect the quality of patient care. The components of clinical competence are illustrated in **Figure 3.1**.

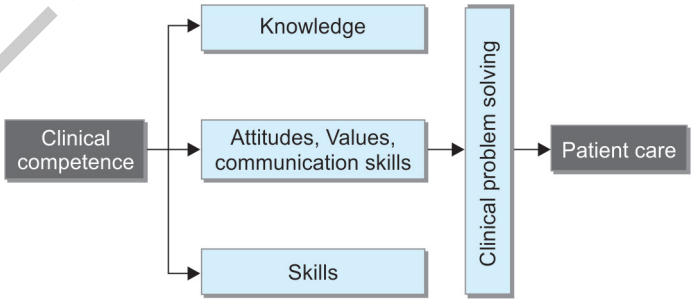

Fig. 3.1: Components of clinical competence.

Written Assessment Methods

We spend considerable time and effort in assessing knowledge using written assessment methods. Written assessment methods are popular because they are easy to conduct and cost-effective when many students must be tested.

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The various written assessment tools are:

- Essay questions, structured essay questions, modified essay questions
- Short answer questions
- Multiple choice questions and their variants

Depending on the expected response format, written assessment methods can have either closed-ended or open-ended formats. The closed-ended questions provide a list of answers as options and are usually of the selection type. Closed-ended questions, i.e., multiple-choice questions will be discussed in Chapter 5. Open-ended questions require examinees to provide answers in their own words, and in this chapter, we will focus on the open-ended formats of written assessment.

Focus on the format of the answer often ignores the format of the stimulus, namely, what is it that the question expects the student to answer and this pertains to the content of the question. Depending on the stimulus format, questions can be context-rich or can be context-free (Schuwirth & Vleuten, 2004). In a context-free question, factual knowledge is usually tested, and the considerations are simple (yes/no type). When the question is directly related to a case and decisions are asked for, the thought processes invoked are entirely different from those evoked by context-free questions. In context-rich questions mainly propositional reasoning occurs, in that candidates weigh different units of information against each other when making a decision (Schuwirth et al., 2000). It is a myth that the format of the question determines the knowledge that is being tested. Research has shown that it is the content of the question, rather than the format which determines almost totally what the question tests (Schuwirth & Vleuten, 2004).

Each question type has its own advantages and disadvantages. Depending on the purpose of the assessment, one must select the most appropriate question type. The choice of question type will vary for high-stakes examinations and for formative assessment. Testing time is often a limiting factor which determines the type and number of questions that can be used. When using open-ended questions, fewer questions can be asked which means lesser content area which can be covered.

Assessment must always be conducted with the educational impact in sight as the students always prepare with examinations in mind. Examiners and question writers therefore must select topics of practical importance. Sadly, it is common practice to ambush the student by asking questions on rare and unusual topics. The intention is either to trip the unwary or to have a higher discrimination between the average

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and good students. This practice leads to deliberate omission of essential components of the curriculum.

Written assessment methods can be used to assess a student's comprehension and ability to analyze, synthesize, and organize information. Unfortunately, we often end up testing recall abilities and factual knowledge. Bloom taxonomy of educational objectives lists out different levels of knowledge which can be tested hierarchically.

Let us understand this with some examples in the **Table 3.1**:

As is seen from this example, instead of merely testing recall, it is possible to test higher levels of knowledge in most topics. We would like you to take a moment here to try and construct questions from higher levels of Bloom taxonomy for a topic that you have taught recently.

We hope that you will have noticed that using a bit of creativity and imagination can help in testing higher order of knowledge instead of

TABLE 3.1: Hierarchical assessment of knowledge

Bloom's levels of cognitive domain	***Measures***	***Common verbs***	***Examples***
Knowledge	Recall of information	Define, classify, describe, name, list	Define infective endocarditis.
Comprehension	Understanding and grasp of information	Explain, interpret, describe, summarize, differentiate, demonstrate	Explain the pathogenesis of infective endocarditis
Application	Use of learnt abstract information to solve a problem	Solve, illustrate, calculate, interpret, apply, demonstrate, put into practice, predict, show	Mr Sethi, a known case of rheumatic heart disease, presents with fever. How will you rule out infective endocarditis?
Analysis	Identification and appreciation of subject matters, most elemental ideas and relationships	Compare, contrast, analyze, discriminate, categorize, organize	Distinguish between acute and sub-acute infective endocarditis
Synthesis	Creating something new and advanced based on sound criteria	Design, hypothesize, support, plan, compose, create, develop	What advice will you give to prevent infective endocarditis in a patient of rheumatic heart disease with a prosthesis?
Evaluation	Judging the value of something for a particular purpose	Evaluate, estimate, judge, defend, appreciate, justify	Justify the use of antibiotics given to this patient with rheumatic heart disease (reports of blood culture and treatment attached)

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framing questions which test rote knowledge. We will now briefly discuss the different types of questions routinely used in assessment of knowledge and learn how we can construct better questions.

Essay Questions

Essay questions are one of the most used formats for assessing knowledge. Here students are expected to write longer answers to broad topics and there is freedom to explore various facets of this topic. The essay question format has the potential to assess the breadth of a student's knowledge, depth of understanding, ability to organize thoughts, and critically analyze information.

Here is an example of the traditional way in which essay questions were posed:

Describe India's National Population Policy 2000.

You will notice that this merely tests reproducibility of factual knowledge. While this kind of question is easy for examiners to construct, it hardly uses the opportunity to assess a student's reasoning capacity or any of the other potential strengths of essay questions listed above. A good essay question asks the student to process information rather than to reproduce it. If the same question is reframed, it gives an opportunity to test the student's higher order thinking.

Critically analyze India's National Population Policy 2000.

The common criticism against essay questions is that the scores obtained are inconsistent and variable. Scoring is difficult to standardize when many examiners are involved in the assessment process and there is a great deal of inter-rater variability. It is hard to remove examiner bias due to the literary ability and handwriting of the student. While essay questions are easy to construct, scoring is rather tedious and time-consuming. Further, a very small sample of the whole content is tested, and this compromises *content validity*. Vaguely worded questions can confuse the student and making scoring difficult. Instead of using restricted response words ('what', 'when', 'list') or vague words ('describe' or 'discuss') in framing the questions it would be better to use words which explore the higher cognitive domains ('compare', 'distinguish between', 'critically analyze,' etc.).

In testing knowledge using essay questions, it is important to maintain a balance between the higher cognitive skills being assessed and the consistency of scoring that can be achieved. Here the purpose of assessment must be kept in mind. When the

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purpose is primarily to assess higher cognition, the question format must allow the student to explore the topic fully and the expected response is unrestricted.

In view of the increasing cases of COVID-19 in this area, propose changes in the health education strategies being used by the national health agencies.

However, in the quest to assess higher cognition, we have to pay a price in terms of reliability. The number of different essays that can be asked in an examination is limited. It is often difficult to construct an ideal model answer and achieve consistency of scoring.

On the other hand, if the examination format specifically requires reliability of scoring, a compromise is usually made with testing higher cognition. While all the problems associated with essay questions described above cannot be eliminated, they can be reduced by using the *structured essay questions*. Here, a question can have several short questions which restrict the responses to a limited range. A well-constructed model answer or key which gives details of expected answers, all possible alternative answers, and the scoring system is needed.

Look at this example:

Describe the etiopathogenesis, diagnostic criteria, sequelae, and complications of rheumatic fever.

This question clearly tells the student exactly what is expected of him, and when a key or model answer is provided to the examiners, scoring is much more consistent. However, this type of question tests more of factual knowledge rather than problem-solving ability. Over-structuring can lead to trivialization of the process (Norman et al., 1991). Another way of improving reliability of scoring is by allowing one examiner to correct answers of all students of one essay each rather than assess the complete paper.

Modified Essay Questions

Of the three areas of cognitive ability (recall and recognition, interpretation of data, and problem solving), testing of problem-solving abilities is not only the most difficult, but also the most neglected aspect. Modified essay questions can help assess recall, comprehension, analysis, synthesis, and evaluation of knowledge.

In a modified essay question, a problem or case scenario is presented to the student and a context is set. The questions are then related to the context. Here is an example:

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A 15-year-old girl presented with symptoms of joint pain in her right knee. She gives history of similar pain in her right elbow 10 days ago which has resolved on its own. She has a history of sore throat 2 weeks ago. On examination, she has a pericardial rub.

a. *What are the possible causes of this condition?*
b. *What investigations will you do to arrive at a diagnosis?*
c. *Describe the most expected gross and microscopic features of this patient's heart.*
d. *If this patient is left untreated, what are the sequelae and complications that she is likely to develop?*

Here, the questions are framed sequentially in a real-life problem-solving approach. Common clinical situations are used, and the aim is to test information of practical importance. If required, additional information can be disclosed in the later questions. This variation in format helps in testing knowledge in a context and helps assess a student's ability to logically analyze and solve a problem.

The problems with framing these kinds of questions are that the latter questions may provide clues to the previous ones. Secondly, as the questions are sequentially connected to each other, the student may be continuously penalized for the same error. It is important that the questions are reasonably independent of each other.

Before deciding the construction and content distribution of the paper, it is necessary to come to an agreement about the marking pattern. The more specific and factual the questions are, the more concise the expected answers will be. While this makes marking more objective and consistent, these questions may not necessarily test the higher levels of cognition. The more one departs into constructing interpretation of data and problem-solving questions, the more "softer" becomes the marking pattern and it is more difficult to mark papers objectively (Irwin & Bamber, 1982). Here, the peer group of examiners must identify reasonable alternatives to answers beforehand. As an educational tool, the modified essay question has the potential of testing all of Bloom's levels. However in order to utilize its full potential, examiners must determine the balance between cognitive levels which they regard as appropriate and construct items which reflect this appropriate balance (Irwin & Bamber, 1982).

Short Answer Questions

Like modified essay questions, short answer questions (SAQs) evoke restricted responses. The expected answers are short and sequential, rather than discursive. SAQs are used in situations where reliability of scoring and objectivity is preferred. They are good at assessing

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specific content areas. They are usually used to test 'must know' areas. They are specific and should have unique single answers. SAQs should be used in those situations where spontaneous generation of the answer is an essential aspect of the stimulus (Schuwirth & Vleuten, 2004).

Short answer questions can be of several types:

a. **Completion type:** Here an important fact is tested by blocking out the key word. Here are some examples:

- *The microorganism responsible for COVID-19 is _____*
- *The dose of Vitamin A for prophylaxis in children above one year of age is ____ IU*
- *Body mass index (BMI) = _____ / _____*
- *Glycosuria normally occurs when blood glucose rises above _____ mg/dL.*
- *_____ crisis is caused in patients of sickle cell disease due to parvovirus infection.*

b. **Best response type:** Here specific responses are desired in the form of several facts or a labeled diagram:

- *What are the major modified Jones criteria?*
- *Draw a labeled diagram of a tubercular granuloma.*
- *Which of the following cardiac markers will be useful in diagnosis of myocardial infarction of a patient a week after the event has occurred and why? Myoglobin, LDH, CK-MB, Troponin I, Troponin C?*
- *A two-year-old girl presents with a triangular foamy white raised lesion over both conjunctivae.*
  a. *What is the name given to the lesion in her eye?*
  b. *What is the most probable cause for this lesion?*
  c. *Name the drug and its dose that you will give to treat this condition?*

c. Open SAQs: Here are some examples of SAQs which allow a certain degree of flexibility in answers. It is important for the key to contain all possible answers to this type of question:

- *List four causes of macrocytic normochromic anemia.*
- *Enumerate two side effects of oral iron administration.*
- *List three complications of acute pyelonephritis.*
- *What are biochemical differences in cerebrospinal fluid between tubercular and viral meningitis?*

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The testing time required for short answer questions is much lesser than what is needed with essay questions. They are less expensive to write and correct. And use of many pertinent SAQs can cover a greater proportion of the syllabus and several content areas in a small time.

Key Points in Framing Questions for Written Assessment

- All assessment methods have their own advantages and disadvantages. No single assessment type is intrinsically superior.
- A good examination will consist of a combination of assessment tools depending on the purpose of assessment.
- Question types should be selected depending upon their strengths and weaknesses.
- The content of the question is more important than the type or format of the question. The kind of thinking process or stimulus that the question will evoke in a student's mind is more important than the format of the question.
- Well-written questions are those which are clear, unambiguous, and can test higher order cognitive knowledge.
- It is important to have predetermined criteria and model answers to ensure consistency in scoring.

REFERENCES

Eraut, M. (1985). Knowledge creation and knowledge use in professional contexts. *Studies in Higher Education, 10(2)*, 117–33.

Irwin, W.G., & Bamber, J.H. (1982). The cognitive structure of the modified essay question. *Medical Education, 16(6)*, 326–1.

Miller, G.E. (1990). The assessment of clinical skills/competence/performance. *Acadamic Medciine, 65(9 Suppl)*, S63–7.

Newble, D.I. (1992). Assessing clinical competence at the undergraduate level. *Medical Educcaton, 26(6)*, 504–11.

Norman, G.R., Van der Vleuten, C.P.M., & De Graaff, E. (1991). Pitfalls in the pursuit of objectivity: issues of validity, efficiency and acceptability. *Medical Education, 25(2)*, 119–26.

Schuwirth, L., Verheggen, M., van der Vleuten, C.P.M., Boshuizen, H., & Dinant, G. (2000). Validation of short case-based testing using a cognitive psychological methodology. *Medical Education, 35*, 348–56.

Schuwirth, L.W., & van der Vleuten, C.P.M. (2004). Different written assessment methods: what can be said about their strengths and weaknesses? *Medical Education, 38(9)*, 974–9.

van der Vleuten, C.P.M. (1996). The assessment of professional competence: developments, research and practical implications. *Advances in Health Sciences Education, 1(1)*, 41–67.

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Principles of
ASSESSMENT IN MEDICAL EDUCATION

The second edition of *Principles of Assessment in Medical Education* is a completely revised version of the earlier edition with many new chapters, diagrams and tables to make the concepts clear. New additions include Programmatic Assessment, Workplace-based Assessment, Direct Observation-based Assessment, Competency-based Assessment, Online Assessment and Assessment for Selection. A chapter on online resources for assessment provides useful web links. There is a tilt to cover the assessment requirements for competency-based medical education; the focus however, continues to remain on formative function of assessment and 'assessment for learning' in the Indian context. Two color printing and 150 additional pages add to the value of the book.

Reviews of the First Edition

Offers multifaceted insight into issues and debates surrounding assessment. —*MedEdWorld (Dundee)*

Every unit of the book has been successful in making readers more passionate for teaching and assessment. —*Journal of Indian Medical Association*

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Ample use of examples makes the book quite readable. —*National Medical Journal of India*

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