

# Blueprinting in Assessment: How much is imprinted in our practice?

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## Introduction

*"If you don't know where you are going, you may end up somewhere, where you didn't intend to"* -Unknown proverb

It is said that 'assessment is the tail that wags the curriculum dog'. While this statement amply underscores the importance of assessment in any system of education, it also cautions us about the pitfalls that can occur when assessment is improperly used<sup>1</sup>.

## Current scenario of Assessment in Medical Education: (figure 1)

When we talk to undergraduate Medical Students after the examinations, not infrequently we hear them complaining,

- “Too Lengthy paper..... Time was not enough to write”, (Theory Examinations)
- “All Questions from few Systems only! No Question from.....”, (Theory Examinations)
- “Questions were too vague, What to write ? What to cut?”, (Theory Examinations)
- “Long Questions were Bouncers! I have not been taught these” (Theory Examinations)
- “I had never seen this case before” ( Practical Examinations)
- “ Most of the theory questions, long case , short case and viva questions, all from one/few systems only” (Practical Examinations)

This happens because, in the traditional assessment system in most Medical Colleges in India, question paper is set by one teacher/Examiner and Practical examinations are conducted by some other teacher, without any Co-ordination (most of the times). Often, the content of what to assess is left to the decision of the Examiners. Moreover, the Examiner/ Teacher imparts instruction according to what 'she/he thinks is appropriate or important'. The intended learning outcomes are not stated clearly and therefore overlooked<sup>1</sup>. Students get confused as they are unaware of what is

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actually expected out of them and they suffer.

Blueprinting in Assessment, can overcome these issues, if not completely, to a large extent and hence make the assessment more valid!

## What is a Blue Print?:

The term 'Blue Print' is derived from the domain of architecture which means 'detailed plan of action'<sup>1</sup>

## What is a Blue Print in Educational Assessment?

Blue print is a map and a specification for an assessment program that ensures that all aspects of the curriculum and educational domains are covered by assessment programs over a specified period of time<sup>2</sup>. It is a three dimensional chart which shows the placement of each question in respect of the objective and the content area that it tests<sup>2</sup>. In simple terms, Blueprint links assessment to learning objectives. It also indicates the marks carried by each question. It is useful to prepare a blue print so that the test maker knows which question will test which objective and which content unit and how many marks it would carry<sup>3</sup>. The blue print concretizes the design in operational terms and all the dimensions of a question (i.e. its objective, its form, the content area it would cover and the marks allotted to it) become clear to the test maker<sup>1</sup>.

It may be a simple content matrix but it can also include further specifications, for example test and assessment methods<sup>2</sup>.

A comprehensive blue print, therefore serves as a reference framework for the question paper setter to prepare the question paper according to the accepted norms and guidelines<sup>1</sup>.

'In an Integrated Curriculum, Blueprint is particularly powerful<sup>4</sup>.

## Need for the Blue print<sup>1,3,5,6</sup>

- It makes the assessment clear, explicit and transparent to everyone involved in the process of learning<sup>1</sup>.

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- It helps to match various competencies with the course content and the appropriate modality of assessment. Effective assessment is possible only when the three elements (Course content, Competencies to be tested & Method of assessment) attain the 'Best fit'<sup>1</sup>.
- It makes assessment 'fair' to the students as they can have clear idea of what is being examined and can direct their learning efforts in that direction<sup>1</sup>.
- It helps the teachers in designing the instruction as per the guidelines expected in the curriculum<sup>1</sup>.
- Ensures that the selected test items "give appropriate emphasis to thinking skills" as "Faculty writing test questions without a blueprint often find that questions asking for simple conceptual knowledge are easier to write than those asking students to interpret, infer, analyze, or think other ways." Subsequently, examiner may have intended to test higher order thinking, but the questions over-emphasize the ability to recall correct facts or recognize correct answers<sup>5</sup>.
- Blueprint deals with the sampling content, competencies and tools for the assessment in a rational and balanced manner. The aim of blueprinting is to reduce the two major threats to validity<sup>3</sup>.

#### **a. Construct Under-representation (CU):**

Refers to under-sampling or biased sampling of the content domain or the course contents. There may be too few items ( Test Items like theory questions or Cases) to sample domain adequately<sup>6</sup>.

e.g.: Too little weightage for a topic of a national health importance OR Some content areas are oversampled while others under-sampled.

(Too many questions from the same topic and no question from some topics)

**b. Construct Irrelevance Variance (CIV):** It is a systematic error (rather than random error) introduced into assessment data by the unrelated variables. This means inclusion of flawed item formats, too easy or too difficult questions or examiner bias<sup>6</sup>. e.g. : Tendency to test favorite, or hot or trivial topics.

#### **Preparation of a Blueprint:**

##### **1. Define the scope and purpose of assessment<sup>1</sup>:**

The first step is to define a purpose and scope of assessment. The purpose of assessment directs the domains of learning to be included and the methods to be adopted.

- What is the Level of students: Undergraduates /Post-Graduates?

- Whether it is Formative / Summative assessment?
- What domain is being assessed, knowledge/ skills/ attitude?

#### **2. Decide the wieghtage to be given to content areas, domains of learning and methods of assessment.<sup>1</sup>**

Weightage can be decided on the basis of two parameters

- i. The perceived impact / importance of a topic in terms of its impact on health.
- ii. The frequency of the occurrence of a particular disease or health problem<sup>7</sup>.

However, this formula requires modification in Basic Sciences. But it may involve some element of subjectivity. Consensus opinion of experts in the subject and other disciplines ( like Surgical Faculty can be involved in deciding the weightage to Anatomy) before allocating the weightage.

Once the weightage for each topic is decided, assignment of weightage to assessment methods has to be considered. It is a well known fact that, no single method can be used to assess all domains. Hence, combination of various methods have to be used to improve the validity of assessment.

#### **3. Decide the total wieghtage and number of items to be included in the assessment<sup>1</sup>:**

One of the methods to increase the reliability of the test is to increase the number of test items. It is recommended that, the realistic time estimation should be made for each test item and summed up for the whole test, after ascertaining that the test fully samples out all the required competencies.

#### **4. Decide on the table of test specifications<sup>1</sup>:**

The table of test specification can be two dimensional (eg. Topics taught and methods used) or a three dimensional one (eg. Topics, Methods and Types of questions) depending upon the variables used. One can be prepared one for the whole examination or can be separate for Written and Practical Examinations respectively (Table 1 and 2). The specification table serves as a template for the question paper setting.

#### **5. Prepare individual questions<sup>1</sup>:**

Based on the table of specifications, Individual questions can be prepared by the paper setter/Examiner. The marking scheme should be clear so as to bring complete transparency to the assessment.

#### **Conclusion:**

Test specifications and the specific test blueprints arising from these detailed specifications form an exact sampling plan for content domain to be tested. This forms the solid foundation for all systematic test development activity and provides evidence for the

content related validity, thus making the assessment more meaningful<sup>6</sup>.

Although, preparation of high quality blue print, is a herculeous task for faculty, it has an important role in increasing validity and reliability of the assessment<sup>1</sup>.

## References

1. Adkoli B, Deepak KK. Blue printing in Assessment. In: Singh T, Anshu (Editors), Principles of Assessment in Medical Education. Jaypee Publishers, New Delhi. 2012 pp205-13
2. Adkoli B. Attributes of a Good Question Paper. In: R. Sood (Ed), Assessment in Medical Education: Trends and Tools New Delhi.
3. KL Wig Center for Medical Education and Technology, AIIMS. 1995.
4. Hamdy H. Blueprinting in Medical Education. New Eng J Med. 2007;356:387-95.
5. Hays R. Assessment in medical education: roles for clinical teachers. The Clinical Teacher, 2008; 5: 23-7.
6. Linda Suskie, Assessing Student Learning: A Common Sense Guide, 2nd ed (San Francisco: Jossey-Bass, 2009), p 167.
7. Downing SM, Haladyna TM. Validity and its threats. In: Downing SM, Rachel Yudkowsky (Editors). Assessment in Health Professions Education. Routledge, New York. p 21-56.
8. Coderre S, Woloschuck W, McLaughlin K. Twelve tips for Blueprinting. Med Teach. 2009;31:322-4.

| Content / System / Topic | Long Essay (10 Marks) | Short essay (5 Marks) | Short Answer (3 marks) | MCQs (1 mark) | Level of Knowledge     | Total marks |
|--------------------------|-----------------------|-----------------------|------------------------|---------------|------------------------|-------------|
| Cardiovascular System    | 1                     | 1                     | 1                      | 2             | Recall Application     | 20          |
| Respiratory System       | -                     | 2                     | 2                      | 4             | Synthesis              | 20          |
| Gastrointestinal System  | 1                     | 1                     | -                      | 5             | RecallSynthesis        | 20          |
| Renal System             | -                     | 2                     | 1                      | 7             | Comprehension          | 20          |
| Hepatobiliary System     | -                     | 2                     | 1                      | 7             | Application Evaluation | 20          |
|                          |                       |                       |                        |               | Comprehension,         | 20          |
|                          |                       |                       |                        |               | Analysis               | 20          |
|                          |                       |                       |                        |               | Recall                 | 20          |
|                          |                       |                       |                        |               | Application,           |             |

Table 1: Example of a Blue print of a written Assessment in Pathology for the Formative Assessment II, Examination of 100 Marks (75 Theory + 25 MCQs, as per KLE University pattern) ( 3 Dimensional Table)

| Content / System / Topic | History taking | General Physical Examination | Systemic Examination | Investigations | Patient Management |
|--------------------------|----------------|------------------------------|----------------------|----------------|--------------------|
| Cardiovascular System    | 3              |                              | 3                    |                |                    |
| Respiratory System       |                | 3                            |                      |                | 3                  |
| Renal System             |                | 3                            |                      | 3              |                    |
| Central Nervous System   | 3              |                              | 3                    |                |                    |
| Hematology               |                |                              |                      | 3              | 3                  |

Table 2: Example of a Blue print of a written Assessment in Medicine for the Formative Assessment II (Two dimensional Table)

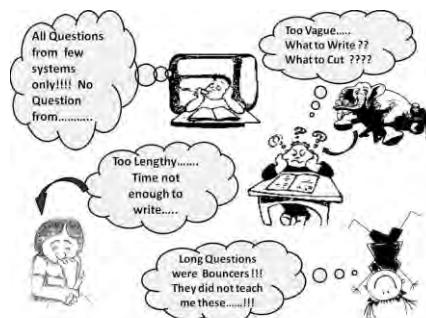


Fig 1: Current Scenario of Assessment in Medical Education

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