Figure-2.4 Order of Thinking Skills

> **Activity-2.3:** Identify the differences in original and revised Blooms Taxonomy and discuss wether these changes are desirable? If yes why.

2.4 Defining Learning Outcomes?

Learning outcomes are the statements indicating what a student is expected to be able to do as a result of a learning activity. Major difference between learning objectives and out comes is that objectives are focused upon the instruction, what will be given to the students and the outcomes are focused upon the students what behaviour change they are being expected to show as the result of the instruction.

1. Different Definitions of Learning Outcomes

Adam, 2004 defines learning outcomes as:

A learning outcome is a written statement of what the successful student/learner is expected to be able to do at the end of the module/course unit, or qualification. (Adam, 2004)

The Credit Common Accord for Wales defines learning outcomes as:

Statements of what a learner can be expected to know, understand and/or do as a result of a learning experience. (QCA /LSC, 2004, p. 12)

University of Exeter (2007) defines:

Learning Outcome: An expression of what a student will demonstrate on the successful completion of a module. Learning outcomes:

- are related to the level of the learning;

- indicate the intended gain in knowledge and skills that a typical student will achieve;

- should be capable of being assessed.

2. Difference between Learning Outcomes and Objectives

Learning outcomes and objectives' are often used synonymously, although they are not the same. In simple words, objectives are concerned with teaching and the teacher's intentions whereas learning outcomes are concerned with students learning.

However, objectives and learning outcomes are usually written in same terms. For further detail check the following website.

http://www.qualityresearchinternational.com/glossary/learningoutcomes.htm

3. Importance of Learning Outcomes

Learning outcomes facilitate teachers more precisely to tell students what is expected of them. Clearly stated learning outcomes:

- help students to learn more effectively. They know where they stand and the curriculum is made more open to them.

- make it clear what students can hope to gain from a particular course or lecture.

- help instructors select the appropriate teaching strategy, for example lecture, seminar, student self-paced, or laboratory class. It obviously makes sense to match the intended outcome to the teaching strategy.

- help instructors more precisely to tell their colleagues what a particular activity is designed to achieve.

- assist in setting examinations based on the content delivered.

- Help in the selection of appropriate assessment strategies.

Activity-2.4	Differentiate between learning Objective and Outcome with the help of relevant examples

4. SOLO Taxonomy

The SOLO taxonomy stands for:
Structure of
Observed
Learning
Outcomes

SOLO taxonomy was developed by Biggs and Collis (1982) which is further explained by Biggs and Tang (2007). This taxonomy is used by Punjab for the assessment.

It describes level of increasing complexity in a student's understanding of a subject, through five stages, and it is claimed to be applicable to any subject area. Not all students get through all five stages, of course, and indeed not all teaching.

1   **Pre-structural:** here students are simply acquiring bits of unconnected information, which have no organisation and make no sense.

2   **Unistructural:** simple and obvious connections are made, but their significance is not grasped.

3   **Multistructural:** a number of connections may be made, but the meta-connections between them are missed, as is their significance for the whole.

4   **Relational** level: the student is now able to appreciate the significance of the parts in relation to the whole.

5   At the **extended abstract** level, the student is making connections not only within the given subject area, but also beyond it, able to generalise and transfer the principles and ideas underlying the specific instance.

> SOLO taxonomy
> http://www.learningandteaching.info/learning/solo.htm#ixzz1nwXTmNn9

2.5   Preparation of Content Outline

First you must understand that what is content. In this regard content refers to the major matter that will be included in a measuring device. For example, the test of General Science he diagrams, pictures of different plants, insects or animal or living or non-living things that constitute the test. For a psychomotor test such as conducting an experiment in laboratory might require setting up of apparatus for the experiment. For an effective device, the content might consist of the series of statement to which the students might choose correct or best answer. Most tests taken by students are developed by teachers who are already teaching the subject for which they have to develop the test. Therefore selection of test content might not be the problem for them. Selection and preparation of content also depends on the type of decisions a teacher has to make about the students. If

the purpose of a test is to evaluate the instruction, then the content of a test must reflect the age appropriateness. If test is made for making decisions regarding selection then the content might of predictive nature. This type of test domain will provide information that how well the student will perform in the program.

A teacher should know that items selected for the test come from instructional material which a teacher has covered during teaching. You may heard about students reaction during examination that ' test was out of course'. It indicates that teacher while developing the test items has not considered the content that was taught to the student. The items included in the test might have been not covered during the instruction period.
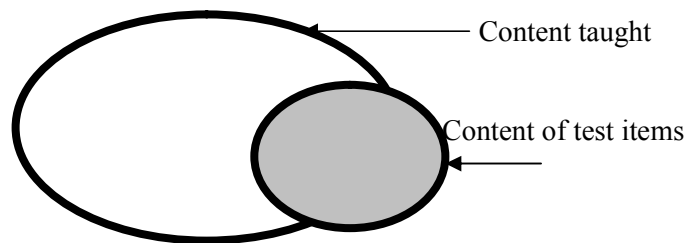
Look at following these diagrams:

Content taught

Content of test items
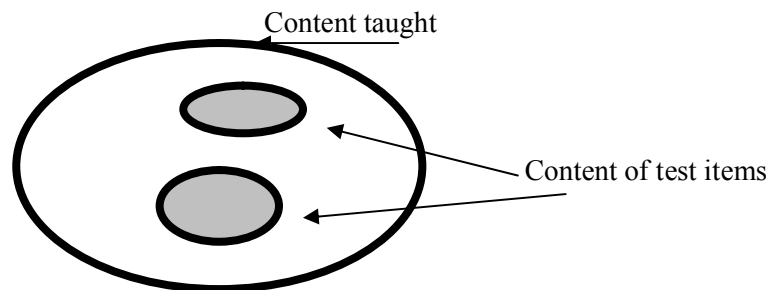
Figure- 2.5   Poor representativeness

Content taught

Content of test items

Figure- 2.6   Inadequate representativeness

Content of the test items

Content of test items
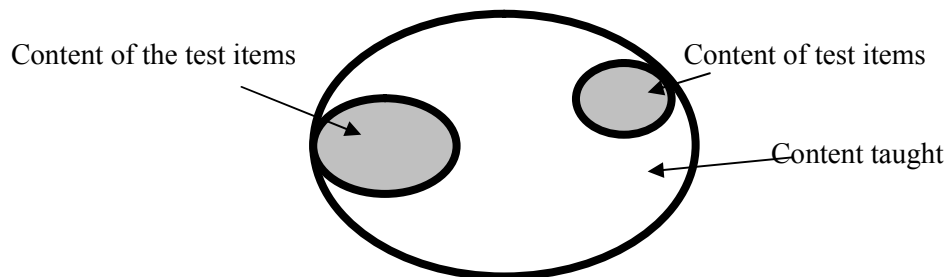
Content taught

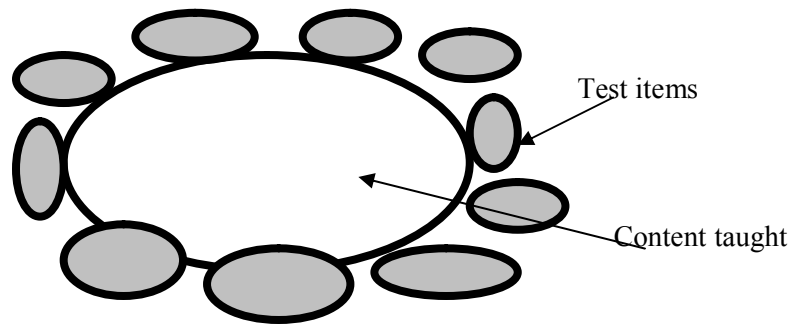**Figure-2.7   Inadequate representativeness**

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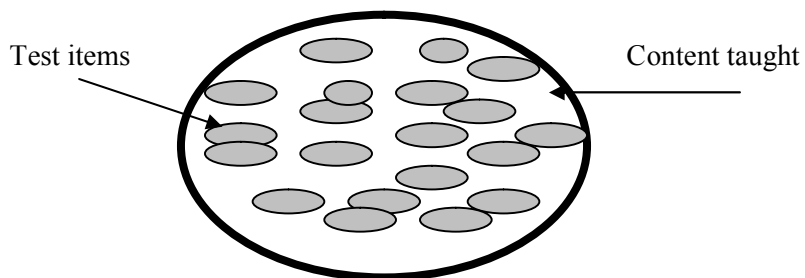**Figure-2.8   Completely inadequate representativeness**

Figure-2.9   Adequate representativeness

In figures 2.5 to 2.9 the shaded area represents the test items which cover the content of subject matter whereas un-shaded area is the subject matter (learning domain) which the teacher has taught in the class in the subject of social studies.

Figures 2.5-2.8   show the poor or inadequate representativeness of content of test items. For example in figure-2.5 test covers a small portion (shaded area) of taught content domain, rest of the items do not coincide with the taught domain. In figure 2.5 & 2.6 most of the test items/questions have been taken from a specific part of taught domain, therefore, the representation of taught content domain is inadequate. Though, the test items have been taken from the same content domain. The content of test items in figure 2.7 give very poor picture of a test. None of the parts of taught domain have been assessed, therefore test shows zero representativeness. None of the test items in figure 2.8 have been taken from the taught content domain. Contrary to this look at figure 2.9, the test items effectively sample the full range of taught content.

It implies that the content from which the test item have to be taken   should be well defined and structured. With out setting the boundary of knowledge, behaviour, or skills to be measured, the test development task will become difficult and complex. As a result

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the assessment will produce unreliable results. Therefore a good test represents the taught content up to maximum extent. A test which is representative of the entire content domain is actually is a good test. Therefore it is imperative for a teacher to prepare outline of the content that will be covered during the instruction. The next step is the selection of subject matter and designing of instructional activities. All these steps are guided by the objectives. One must consider objectives of the unit before selection of content domain and subsequently designing of a test. It is clear from above discussion that the outline of the test content should based on the following principles:

1.   Purpose of the test (diagnostic test, classification, placement, or job employment)

2.   Representative sample of the knowledge, behaviour, or skill domain being measured.

3.   Relevancy of the topic with the content of the subject

4.   Language of the content should be according to the age and grade level of the students.

5.   Developing table of specification.

A test, which meets the criteria stated in above principles, will provide reliable and valid information for correct decision regarding the individual. Now keeping in view these principles go on the following activity.

Activity-2.5:

Visit elementary school of your area and collect question papers/tests of sixth class of any subject developed by the school teachers. Now perform the following:

(1)   a.   How many items are related with the content?

      b.   How many items (what percentage) are not related with the content covered for the testing period?

      c.   Is the test representative of the entire content domain?

      d.   Does the test fulfill the criteria of test construction? Explain.

(2)   Share your results electronically with your classmates, and get their opinion on the clarification of concept discussed in unit-2

2.6   Preparation of Table of Specification

It has been discussed earlier that the educational objectives play a significant role in the development of classroom tests. The reason is that the preparation of classroom test is closely related to the curriculum and educational objectives. And we have also explained that a test should measure what was taught. For ensuring that there is similarity between classroom instruction and test content is the development and application of **table of specification,** which is also called **a test blue print.** As the name implies, it specifies the

content of a test. It is a two-way framework which ensures the congruence between classroom instruction and test content. This is one of the most popular procedures used by test developers for defining the content-domain. One dimension of the test reflects the content to be covered and other dimension describes the kinds of student cognitive behaviour to be assessed. Table 2.1 Provides the example of table of specification.

Table 2.1   General Table of Specification

Number of Test Items for Each Cognitive Level

Topics	Knowledge	Comprehension	Application	Analysis	Total
Topic 1	5	2	2	3	**12**
Topic 2	3	3	4	2	**12**
Topic 3	2	2	3	2	**9**
Topic 4	3	3	1	1	**8**
Topic 5	1	2	1	1	**5**
Topic 6	2	2	0	0	**4**
Total	**16**	**14**	**11**	**9**	**50**

 Look at table 2.1, the top of each column of the table represent the level of cognitive domain, the extreme left column represent the categories of the content (topics) or assessment domains. The numerals in the cells of two way table show the numbers of items to be included in the test. You can readily see that how the fifty items in this table have been allocated to the content topics and the levels of cognitive behaviour. The teacher may add some more dimensions. The table of specification represents four level of cognitive domain. It is not necessary for teacher to develop a test that completely coincides with the content of taught domain. The teacher is required to adequately sample the content of the assessment domain. The important consideration here for teachers is that they must make a careful effort on conceptualizing the assessment domain. An appropriate representativeness must be ensured. Unfortunately, many teachers develop tests without figuring out what domains of knowledge, skills, or attitude should be promoted and consequently, formally be assessed.   A classroom test should measure what was taught. In simple words a test must emphasize what was emphasized in the class.   Now look at table 2.2 . The table of specification shows the illustration of assessment domain of unit-2 of this book:

Table 2.2   Table of Specification of Unit-2

Number of test Items for Each Cognitive Level

Topics	Knowledge	Comprehension	Application	Analysis	Total
Purpose of a test:	2	1	1		**4**
Objectives and Educational outcomes	2	2	2	1	**7**
Preparation of content outline	2	2	2		**6**
Preparation of table of Specification	2	3	2	1	**8**
Total	**8**	**8**	**7**	**2**	**25**

Table 2.2 is a very simple table of specification. It is possible to add more dimensions of the content. You may further distribute the table in subtopics for each main topic. Lets have another look on a very specific table of the following:

Table 2.3   Specific Table of Specification
Number of Test Items for following Cognitive Level
Knowledge   Comprehension Application   Analysis

Level of Cognitive domain Topics	Knows symbols & terms	Knows specific facts	Understands effects of factors	Solves equation	Interprets results	**Total**	**Total**
Speed & Velocity	2	2	2	3	4	**13**	**26%**
Potential Energy and Kinetic Energy	4	2	2	4	4	**16**	**32%**
Law of Motion	4	4	4	5	4	**21**	**42%**
Total	**10**	**8**	**8**	**12**	**12**	**50**	**100 %**
Total %	**20 %**	**16%**	**16%**	**24%**	**24%**	**100 %**	

A table of specification helps teachers to review the curriculum content on one hand and on the other hand it helps teachers to be careful in overlooking important concepts or including unimportant and irrelevant concepts. On the similar patterns a teacher can develop table of specification for affective and psychomotor domain.

Activity 2.6:   Prepare table of specification for unit-2, you have just studied.

2.7   Self- Assessment Questions:

(1)   Explain with examples the purpose a classroom test.

(2)   How do you define an objective and a outcome? Differentiate between objectives and outcomes with the help of examples.

(3)   What is your understanding on the importance of learning outcomes?

(4)   What is cognitive domain? Explain all levels with examples.

(5)   Develop two objectives for measuring recall level, two objectives for measuring application level and two for evaluation level for 5th class from English text book,

(6)   Prepare a table of specification of 50 items for General Science subject for 6th class.