The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation

Table of Specifications

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Book Title: The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation
Chapter Title: "Table of Specifications"
Pub. Date: 2018
Access Date: April 19, 2018
Publishing Company: SAGE Publications, Inc.
City: Thousand Oaks,
Print ISBN: 9781506326153
Online ISBN: 9781506326139
DOI: http://dx.doi.org/10.4135/9781506326139.n685
Print pages: 1655-1657

The table of specifications (TOS) is a tool used to ensure that a test or assessment measures the content and thinking skills that the test intends to measure. Thus, when used appropriately, it can provide response content and construct (i.e., response process) validity evidence. A TOS may be used for large-scale test construction, classroom-level assessments by teachers, and psychometric scale development. It is a foundational tool in designing tests or measures for research and educational purposes.

The primary purpose of a TOS is to ensure alignment between the items or elements of an assessment and the content, skills, or constructs that the assessment intends to assess. That is, a TOS helps test constructors to focus on issue of response content, ensuring that the test or assessment measures what it intends to measure. For example, if a teacher is interested in assessing the students' understanding of lunar phases, then it would be appropriate to have a test item asking them to draw the phases of the moon. However, a test item asking them to identify the first person to walk on the moon would not have the same content validity to assess students' knowledge of lunar phases.

In addition, a TOS can also be used to provide response process validity evidence for test constructors. Response process refers to the kind of thinking that is expected of the test taker in completing the assessment. For the lunar phases, for example, a teacher may expect students to memorize the phases of the moon and therefore a knowledge-level (relying on recognition or memory) question would be appropriate. Alternatively, if the teacher taught the lessons such that students tracked the moon for a month, developed lunar journals, and discussed the reasons for the different phases, then the assessment should target higher level thinking such as analysis, evaluation, and synthesis. As such, asking students to draw a model of the lunar phases with annotated explanations would be better aligned to the kind of thinking that students experienced during instruction.

The TOS is typically constructed as a table that includes key information to help teachers align the learning objectives that represent the content and cognitive levels intended for students to achieve with class time spent and the number of test items. Table 1 provides an example of a TOS for a chapter test on "New Ideas for a New Century," from Molefi Kete Asante's (1995) *African American History: A Journey of Liberation*. This entry explored the roles of prominent African American leaders from 1895 to 1919. Before constructing the TOS, the teacher decided the total number of items to include (i.e., 10) and quantity and type of those items (i.e., five multiple-choice and five short answers), and the decision was made based on the time allocated for students to complete the test and students' general test-taking abilities. Next, the teacher referred to the lesson plans and notes to determine the content in columns A–C (i.e., day, learning objectives, time spent on objective). To calculate the percentage of class time for each objective (column D), the teacher divided the minutes spent teaching each objective (column C) by the total minutes for the unit and multiplied by 100. Determining the percentage of time spent in class on each objective is one approach to identifying how many items on the test should address any particular objective and enhances test content validity evidence.

Next, the teacher multiplied the percentage of time on topic (column D) by the total number of items on the test (10) to determine the number of items needed to measure each objective. Note that the teacher rounded to whole numbers when appropriate. In some instances (see Objective 4), none of the test items was used to assess that objective. In other words, not enough instructional time was spent teaching that content to justify assessing it on the unit test. Column F shows the classification whether each objective measured lower or higher

order thinking processes. Lower level thinking processes require students to remember or understand, whereas higher level thinking processes requires students to apply, analyze, synthesize, and evaluate. Finally, with the information in columns E and F, the teacher determines the information in column G. Recall that prior to TOS construction, the teacher decided that both multiple-choice and short-answer items would be distributed evenly. The teacher used knowledge of the content and cognitive level along with professional judgment to determine the best one for each item.

Table 1 Table of Specifications: New Ideas for a New Century Unit

A	B	C	D	E	F		G
					Number of Items to Create at Each Level		
Day	*Objective Students will be able to:*	*Minutes Spent on Topic*	*% of Time on Topic = % of Topic on Test*	*# of Items per Objective for a 10 = Item Test*	*Lower Processes* • *knowledge* • *understanding*	*Higher Processes* • *analysis* • *synthesis* • *evaluation*	*Description of Item on Test*
Mon	Identify key themes Washington addressed in his 1895 Atlanta Compromise Speech.	10	6%	1	✓		1 lower level item
Mon	Describe how Washington's beliefs were viewed by Whites and Blacks at the time.	30	18%	2	✓		2 lower level items
Tues	Explain the roles of William Monroe Trotter, Ida B. Wells, and W. E. B. DuBois in this part of American History.	35	21%	2	✓		2 lower level items
Tues	List the reasons for which an African American could be lynched.	5	3%	0	✓		0
Wed	Explain DuBois's description of the advent of African American freedom over two decades.	30	18%	2	✓		2 lower level items
Wed	Analyze the similarities between DuBois and Wells.	10	6%	1		✓	1 higher level item
Thurs	Compare and contrast the views of Washington, Wells, and DuBois.	20	13%	1		✓	1 higher level item
Thurs	Evaluate the impact each of these leaders had on the future of African Americans.	20	13%	1		✓	1 higher level item
	TOTAL Instructional time to be assessed	160	100%	10			

See also Alignment; Bloom's Taxonomy; Classroom Assessment; Construct-Related Validity Evidence; Content-Related Validity Evidence; Curriculum-Based Assessment; Instructional Objectives; Item Analysis; Multiple-Choice Items; Standards-Based Assessment; Tests; Validity

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http://dx.doi.org/10.4135/9781506326139.n685
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Further Readings

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