
**TCAP Achievement Levels: Standard Setting Process and Implementation for
Algebra II**

The Background:

Tennessee state law, Tenn. Code Ann. §49-1-302(a)(8), gives the State Board of Education the duty and authority to set policies governing all curricula and courses of study in K-12 public schools, including the adoption of standards.

Relevant excerpt of this law and not the entire statute §49-1-302.:

“Powers and duties of the board — Confidentiality of records — Standards, policies, recommendations and actions subject to appropriations — Guidelines and criteria for evaluation of certificated employees — “

The Tennessee Department of Education, Office of Assessment, Evaluation, and Research conducted Tennessee Comprehensive Assessment Program (TCAP) Achievement Level panel meetings for the End of Course (EOC) Algebra II assessment on June 27-28, 2011. Achievement level meetings, both nationally and historically in Tennessee, are conducted when the state develops a new assessment or the state’s curriculum standards change significantly. Both factors are in evidence and require new achievement levels be updated and adopted to reflect the efforts of the Tennessee Diploma Project (TDP) as related to college and career readiness.

During the testing year 2010-11, the current vendor, Pearson Education Measurement (PEM) with sub contractor Educational Testing Service (ETS) conducted achievement level panel meetings for the Algebra II EOC assessment. Tennessee educators, who were knowledgeable in the content areas, familiar with Tennessee new high school graduation requirements, and drawn from various stakeholder groups statewide, served on the panels. The panels included seventeen (17) educators from across the state. Three of these educators were either adjunct or full professors in the Tennessee higher education community. The panel’s work concluded with starting points for discussion/determination of achievement levels on the algebra II assessment. The vendor (PEM/ETS) was responsible for overseeing the standard-setting process and for training selected panelists in standard-setting procedures. The vendor was also required to use an empirical standard-setting process in which the panelists reviewed TN curriculum standards and established achievement level recommendations using items representing forms of the 2010 -11 assessment.

Immediately following the panel meetings on July 1, 2011, the Technical Advisory Committee (TAC) comprised of five (5) nationally recognized standard-setting professionals and one (1) in-state representative, reviewed and determined that the process used for the Algebra II assessment was of the highest standards and was carried out well. The TAC suggested a continuation of a strategic assessment plan to

include three components- communication, curriculum match or link, and professional development.

Historically, Tennessee's strategic assessment plan has included these components beginning with a cohort class of students to be affected by these high stakes assessments. This plan would require a complete cycle of administrations not to occur in the middle of an Adequate Yearly Progress (AYP) year as established by the Elementary and Secondary Act (ESEA) updated as "No Child Left Behind" (NCLB). Although this assessment is not used for AYP, the Office of Assessment follows the same requirements. This timeline would require new achievement levels for the 2010-11 TCAP End of Course Algebra II assessment.

Following the TAC review and recommendation, the Algebra II recommendations were shared with the Department staff and Commissioner.

The efforts of the Tennessee Diploma Project (TDP) has provided for the establishment of rigorous K-12 college- and career-ready curriculum standards, an alignment of assessments to the college- and career-ready curriculum standards, and a new strategic assessment implementation plan to include new achievement levels, college- and career- ready definitions and descriptors, communications to the public, and professional development for practitioners. The Department initiated and received an external curriculum alignment study; established committees to revise curriculum standards; revised curriculum standards to college- and career-readiness specifications in math, reading/language arts, and science; recommended for review and approval the revised curriculum standards to the State Board of Education (SBE); negotiated with vendors appropriate timelines for alignment and development of new TCAP End of Course assessments; and implemented new assessments in the 2009-10 school year and beyond up to ten (10) EOC assessments. The Algebra II assessment is the first of two (2) anchor assessments (English III will be operational for the 2011-12 SY) that would be used by TN higher education for placement purposes.

Upon the Commissioner's and departmental review of the recommended achievement level cut scores, the decision was made to use an equipercentile approach for establishing a concordance table to compare student test scores between SY 2010-2011 Algebra II and 2011 ACT Math results. The goal was to ensure that the achievement levels were appropriately rigorous given the fact that Algebra II is an anchor assessment used by TN higher education for placement purposes and student performance on ACT Math should correspond closely given the fact that the ACT is used to determine college readiness. Upon the Commissioner's and departmental review of the concordance table, the decision was made to increase achievement level cut scores appropriately to more closely align students' ability to achieve proficiency on Algebra II with their ability to achieve college readiness as defined by ACT. Representatives from the TN Higher Education Commission reviewed and approved the adjusted achievement levels.

The Master Plan Connection:

This item supports the Board's *Master Plan* by assessing the level for which each student has learned the Curriculum, by providing appropriate data to prioritize instructional Resources, by enhancing educational Leadership with the use of these

data to inform the educational decision-making process, and by providing student level achievement and growth data to support excellent Teaching and learning of the college- and career-ready standards.

First to the Top Connection:

Tennessee First to the Top Application, Section B(3): *Tennessee's goal for this reform plan criterion is to infuse our schools with world-class standards that are benchmarked internationally, rolled out locally through consistent professional development, and linked to an assessment system that accurately measures student performance against the standards.*

The Recommendation:

The Department of Education recommends that new assessment achievement standards be adopted to support the current K-12 reform efforts as implemented in the 2009-2010 curriculum standards and aligned to 2010-11 Algebra II operational assessment on final reading. The SBE staff concurs with this recommendation.



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BILL HASLAM
GOVERNOR

KEVIN HUFFMAN
COMMISSIONER

To: Members and Executive Staff, Tennessee State Board of Education

From: Zachary Rossley, Interim Executive Director
Office of Assessment, Evaluation, and Research

Re: SBE Agenda Item - TCAP Algebra II Achievement Levels: Standards Setting
Process and Implementation

Date: October 18, 2011

The Tennessee Department of Education, Office of Assessment, Evaluation, and Research and its vendors Pearson and ETS conducted Tennessee Comprehensive Assessment Program (TCAP) Achievement Level panel meetings for TCAP End of Course (EOC) Algebra II in June 2011. The performance (achievement level) standard setting process is used to determine the depth and breadth of the content standards a student must have to demonstrate competency at each achievement level (Below Basic, Basic, Proficient and Advanced).

The panels, comprised of Tennessee teachers and educational administrators, were chosen for their knowledge in the tested content, their familiarity with the students, and their diverse backgrounds, demographics, and experiences. The diverse group of panelists represented Tennessee's various regions including urban and rural settings.

An augmented Bookmark Method was used to set achievement levels for Algebra II. The Bookmark Method is a three-round standard (achievement level) setting process that requires panelists to independently examine test items and place bookmarks at the points at which they consider students to have demonstrated sufficient knowledge and skills at each achievement level. Additionally, reference data were provided showing TN student's performance on 4th and 8th grade NAEP and 8th grade Explore, 10th grade PLAN, and 11th grade ACT national assessments. For all TCAP tests, the panelists' work concluded with starting points for discussion/determination of performance at the achievement levels of Below Basic, Basic, Proficient and Advanced.

Immediately following the educator panel meetings, the Technical Advisory Committee (TAC) comprised of five (5) nationally recognized standard-setting professionals and one (1) in-state representative met on July 1, 2011 and reviewed then determined that the process used for each assessment was of the highest standards and was carried out well. The TAC suggested a strategic assessment plan begin immediately to include three components-communication, curriculum match or link, and professional development.

The recommendations from the standards setting and TAC meetings as well as a follow-up study aimed at ensuring the achievement levels were sufficiently rigorous were provided to Department of Education staff including the Commissioner for final review and recommendation to the TN State Board of Education for the final phase of discussion and approval.

The table below summarizes the achievement levels as recommended for final discussion that would lead to SBE approved achievement levels for Algebra II 2010-11 assessments and until such time as a change in curriculum standards and assessments are required in future years.

Table1. Performance Levels for TCAP Achievement Algebra II EOC

Total number of students assessed in 2010-11 = **56,355**.

Note: * HOSS = Highest Obtainable Scale Score.

| TCAP End of Course (EOC Algebra II) 55 items | | | | |
|---|----------------------|----------------------|----------------------|----------------------------|
| Achievement Levels | Below Basic | Basic | Proficient | Advanced (HOSS=900) |
| Scale Score Levels | 500 - 683 | 684 | 732 | 771 |
| Raw Score Levels (Fall/Spring) | 0 - 24/26 | 25/27 | 36/39 | 45/47 |
| % and number of Students at Level | 34% 19,161 | 35% 19,724 | 20% 11,271 | 11% 6,199 |

Memorandum

To: Tennessee Department of Education
From: Chris Domaleski, Technical Advisory Committee (TAC) Chair
Date: July 8, 2011
Re: Review of Algebra II Standard Setting

The Tennessee Department of Education (TDOE) adopted new curriculum framework and content standards designed to support the state's vision and mission to prepare all Tennessee students for successful post-secondary work, education and citizenship. As part of the process, the TDOE and its assessment contractors, Pearson and Educational Testing Service (ETS), developed and implemented procedures to establish new performance standards for a number of state assessments including, most recently, the Algebra II End of Course (EOC) Assessment.

The standard setting process facilitated by the contractors was based on the widely-used Bookmark method. However, the traditional procedure was modified to promote the TDOE's goal of identifying standards associated with college and career readiness. These modifications included introducing NAEP and ACT performance data during the standard setting process and including post-secondary faculty among the standard setting panelists.

On Friday, July 1, 2011, Tennessee's national Technical Advisory Committee (TAC) convened via web conference to review the standard setting activities (see Appendix for a roster of the TAC membership). This review included careful scrutiny of both the design and implementation of the standard setting procedures. Based on the evidence and information available, TAC reached the following conclusion:

The TDOE and its contractors developed an appropriate standard setting plan. Moreover, based on the information provided, that plan appears to have been faithfully implemented. The grounding of the plan in professionally-accepted practices and the fidelity of its implementation suggest that the TDOE can have confidence that the resulting performance standards provide a sound and defensible basis for assessing and evaluating student academic achievement and progress aligned with college and career readiness.

The TAC did recommend, however, that an external evaluator observe future standard setting meetings. This will provide an independent source of information regarding the fidelity of implementation.

The TAC understands that the next step in standard setting involves additional review of the recommended performance standards and that the Tennessee State Board of Education is ultimately charged with establishing the performance standards for Tennessee assessments. This is fitting given the central role that these performance indicators play in state education policy.

The TAC will continue to work with the TDOE on standard setting and other technical issues to provide feedback, advice, and recommendations as needed.

Appendix

Tennessee National Technical Advisory Committee Members

- John R. Barker, Ph.D. Executive Director of Research, Assessment ,Evaluation, and Student Information Memphis City Schools
- Seung W. Choi, Ph.D. Director of Psychometrics and Biostatistics, Assistant Professor, Department of Medical Social Sciences, Northwestern University Feinberg School of Medicine
- Gregory J. Cizek, Ph.D. Professor of Educational Measurement and Evaluation, University of North Carolina at Chapel Hill
- Chris Domaleski, Ph.D. Senior Associate, National Center for the Improvement of Educational Assessment
- Seock-Ho Kim, Ph.D. Professor of Educational Psychology and Instructional Technology, The University of Georgia
- Barbara Plake, Ph.D. Professor Emeritus, University of Nebraska-Lincoln