I. Background on the MAPT-CCR, What It Measures, and How it Works

MAPT-CCR Overview

The MAPT-CCR is the Massachusetts Adult Proficiency Test - College and Career Readiness (MAPT-CCR). The federal government requires that federally-funded Adult Education (AE) programs report student outcomes. The MAPT-CCR for Math and the MAPT-CCR for Reading are the assessments that Massachusetts uses for this accountability purpose. The Adult and Community Learning Services (ACLS) unit of the Massachusetts Department of Elementary and Secondary Education (ESE) has had a contract with the Center for Educational Assessment at the University of Massachusetts Amherst (UMass) to develop and maintain the MAPT testing program since 2003.

The MAPT assessment has long been a collaboration between test developers at UMass, ESE/ACLS staff, and AE program staff. Many of the items are written by AE educators, and AE program staff from all over Massachusetts have been involved in many test development activities over the years, including developing test specifications, reviewing items for content and cognitive validity studies, setting standards, and carrying out sensitivity reviews.

What the MAPT-CCR Measures

The MAPT-CCR for Math and the MAPT-CCR for Reading measure the skills of students ranging from the National Reporting System's Beginning Basic Literacy and Numeracy levels through High Adult Secondary Education (High ASE). The National Reporting System (NRS) is the reporting system used by the U.S. Department of Education's Division of Adult Education and Literacy to track educational gains, among other outcomes. Federal gains are evaluated by student progression through a series of Educational Functioning Levels (EFLs). In the table below, the EFLs and grade level equivalents (GLEs) for Math are in the first and second columns, followed by the EFLs and GLEs for Reading in the third and fourth columns, and the final column provides the MAPT-CCR score range that corresponds to each EFL.

Math		Reading		MAPT-CCR Scale Range
EFL	GLE	EFL	GLE	
Beginning Basic Numeracy	2-3.9	Beginning Basic Literacy	2-3.9	200-299
Low Intermediate Adult Education	4-5.9	Low Intermediate Adult Education	4-5.9	300-399
Middle Intermediate Adult Education	6-7.9	High Intermediate Adult Education	6-8.9	400-499
High Intermediate Adult Education	8.0-8.9	Low Adult Secondary Education	9-10.9	500-599
Adult Secondary Education	9-12.9	High Adult Secondary Education	11-12.9	600-700

Students with a GLE of 0-1.9 in AE should not take the MAPT-CCR; students at that level should be administered the TABE 9/10 Level L.

The MAPT-CCR measures the *College and Career Readiness Standards for Adult Education* (CCRSAE; Pimentel, 2013), specifically the Reading Standards (the MAPT-CCR for Reading) and the Mathematics Standards (the MAPT-CCR for Math).

The MAPT-CCR for Math is defined using two dimensions. The first dimension is a *content* dimension comprising the seven content domain groups contained in the *CCRSAE* levels B through E. These domain groups are:
- Numbers and Operations: Base Ten (NBT)
- Operations and Algebraic Thinking (OA) and Expressions and Equations (EE)
- Numbers and Operations: Fractions (NF) and Ratios and Proportional Relationships (RP)
- The Number System (NS)
- Geometry (G)
- Measurement and Data (MD) and Statistics and Probability (SP)
- Functions (F)

The second dimension is a cognitive (reasoning) dimension referenced as Components of Rigor, and contains three levels: Recall, Skill/Concept, and Strategic Thinking.

The MAPT-CCR for Reading is structured as follows, with three Groups: *Key Ideas and Details*, *Craft and Structure*, and *Integration of Knowledge and Ideas*. There are several topics within each standard.
- *Key Ideas and Details* includes (a) locating explicit information in text, (b) determining central ideas/themes, (c) summarizing key supporting details and ideas, and (d) identifying and analyzing connections in text.
- *Craft and Structure* includes (a) identifying words, (b) using general academic vocabulary, (c) understanding figurative language, word relationships, and nuances in word meanings, (d) understanding author's purpose and organization, and (e) identifying and analyzing literary structures, techniques, and styles.
- *Integration of Knowledge and Ideas* includes (a) using information & ideas from diverse media and formats, (b) evaluating content and claims, and (c) combining and comparing/contrasting themes, ideas, points of view, claims.

The Reading test is further specified with literary and informational passages.

How the MAPT-CCR Works
The MAPT-CCR is a computerized-adaptive test that measures the wide range of knowledge and skills present in the population of adult students in Massachusetts, which ranges from Beginning Basic (GLE 2.0) to High Adult Secondary (12.9). Computerized adaptive testing (CAT) uses the computer to select and deliver test items to test-takers. It is called *adaptive* because the computer selects the items to be administered to a specific test-taker based on his or her achievement level and the difficulty of the items. Unlike many traditional tests where everyone takes a single form of an exam, the computer tailors the exam to each

student. This tailoring is done by keeping track of a student's performance on a set of test questions and then using this information to select the next set of items to be administered.

The MAPT-CCR adapts by sets of items, so if a test taker does well on a set of items, the next set will be harder; if the test-taker has trouble with a set of items, the next set administered will be easier. By adjusting the difficulty of the test in this way while the test is in progress, individual students will **not** receive items that are far above or far below their skill level.

The figure below presents a schematic drawing of the adaptive design of the MAPT-CCR.

MAPT-CCR Adaptive Test Design
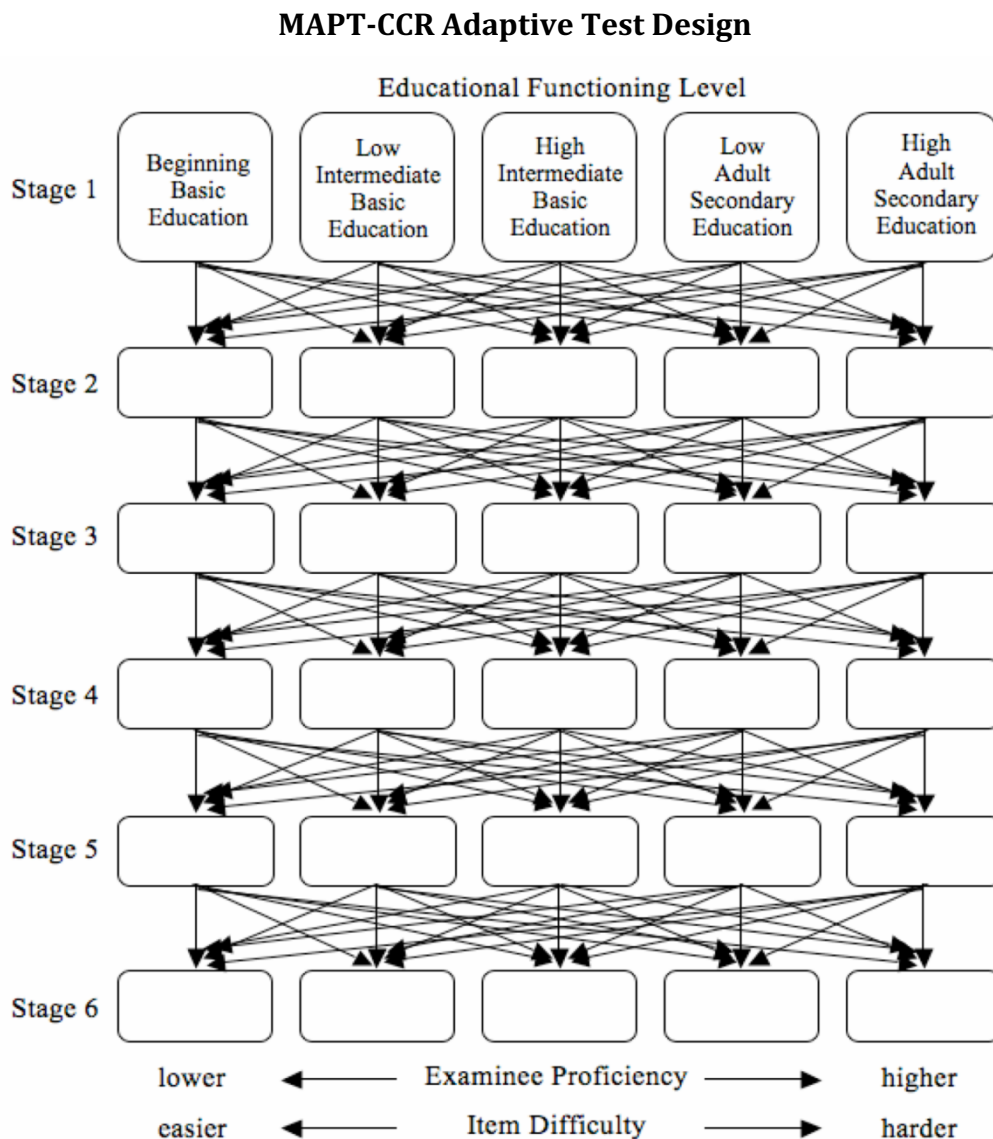
Each student who takes the MAPT-CCR receives 35 scored items and 5 pilot items for a total of 40 items. Those items are divided among six sets of items called "stages", as shown

to the left in the figure above. Items are scored as students answer them and the next set of items is selected and administered automatically without interrupting the flow of the test.

Students start the MAPT-CCR at one of five Educational Functioning Levels, ranging from Beginning Basic Education to High Adult Secondary Education in Reading and Beginning Basic Education through Adult Secondary in Math. As students progress through the test from stage to stage, the computer algorithm computes and updates the MAPT-CCR score estimate for each student, and that algorithm considers how students are doing and chooses the item set in the next stage that is at the most appropriate difficulty level for them. More proficient examinees will see harder item sets, and less proficient examinees will see easier item sets. It is common for examinees to see items that are of a similar difficulty level throughout their test, but any sequence of difficulty across six stages is possible.