

Michigan's Transition to Postsecondary Education and the Workplace



VII. The Missing Pieces: Bridging the Gap

**Michigan Economic Development Corporation
Workforce Development Agency State of Michigan
Office of Adult Learning**

Executive Summary

Each year, thousands of adult learners pass the GED® test and earn a GED® credential. Unfortunately, passing the GED® test does not always enable many of these students to immediately begin work toward their ultimate goal – a career of their choice and successful entrance into a postsecondary education or training program. Instead, many GED® graduates must first complete extensive remediation prior to enrollment in credit-granting courses or settle for positions that do not meet their career goals.



Many adult learners enter programs thinking that they can obtain the skills necessary to pass the GED® test within a very short time frame. This requirement for immediacy is often reflected by students settling for a minimal passing score on the GED® test, believing that it is all they need to pursue their long-term career and educational goals. However, a minimal score does not mean that a GED® graduate is ready for a degree-granting course of study or today's workforce. There are many “missing pieces” that result in a gap between a GED® credential obtained through a minimal passing score and the skills necessary for success in the 21st century. To bridge the gap, GED® programs need to provide:

- ❖ A curriculum that incorporates the higher-order thinking skills identified by the 2002 Series GED® Test, rather than the basic skills of ABE (Adult Basic Education) programs
- ❖ A wide range of instructional strategies to ensure students are prepared for the GED® test, as well as career- and college-placement tests.
- ❖ A focus on helping students “learn to learn” as well as the ability to understand and use higher- order critical thinking skills.
- ❖ More specific counseling and support for students as they develop attainable goals and work to achieve those goals.
- ❖ Homework and other out-of-class assignments completed by students.

The first step in identifying the “missing pieces” to bridge the gap between the GED® credential and the skills required by postsecondary education and training, as well as the workforce, is to compare the skills currently being taught in GED® programs with the standards that comprise the 2002 Series GED® Test.

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The Missing Pieces: Bridging the GED® Gap

Introduction to Bridge Programs

Bridge programs are a 21st Century concept that provide individuals with the academic, employability, and technical skills necessary to succeed in postsecondary education and training and today's workplace. Viewed as an essential component in a career pathway, research indicates that the most effective way to help adults improve their basic skills is to teach the basics in the context of training for jobs, preparing for employment, or some other activity that is meaningful to their lives.

The curriculum of this type of a bridge program is defined in terms of competencies needed to succeed in postsecondary training and jobs. Bridge programs are focused on the basics of communication, problem-solving, applied mathematics, technology applications, and technical fundamentals taught in the context of problems and situations drawn from the workplace and the postsecondary classroom.

At the foundation of a bridge program is a set of personal effectiveness, academic, and workplace competencies that adult learners need to be successful. These include:

- **Personal Effectiveness Competencies** in interpersonal skills, integrity, professionalism, initiative, dependability and reliability, and willingness to learn.
- **Academic Competencies** in reading, writing, mathematics, science and technology, listening and speaking, critical and analytic thinking, active learning, and basic computer skills that can be contextualized to various occupations.
- **Workplace Competencies** in such areas as teamwork, customer focus, creative thinking, and flexibility.

The Missing Pieces: GED®-Level Skills

Although there are many different types of bridge models within a career pathway framework, there is a need to assess the missing piece in GED® programs. That missing piece is the teaching of skills appropriate to GED®-levels of instruction.

Whether a student wishes to transition to the workplace or to postsecondary education and training, there are certain skills that are necessary for success. These skills are often the “missing piece” in the traditional GED® curriculum. In today's world, a minimum score of a 450 average on the GED® test is not enough. Rather than simply “teaching to the test” to help students obtain a minimal score, it is necessary to integrate those skills assessed by the GED® test to help students bridge the gap.

From accurate assessment to managed enrollment to a comprehensive curriculum, the first step in identifying the missing pieces in the GED® curriculum is to review the types of skills currently assessed.

2002 Series GED® Test

Overview of Skills Assessed by the 2002 Series GED® Mathematics Test

The content of the GED® Mathematics Test is based on 1999 standards for high school math programs throughout the United States. These standards will be replaced by the more rigorous Common Core State Standards in 2014. However, the skills that are currently included on the test provide an overview of what skills should be taught in all GED® programs, not just those that focus on GED® transition.

Many programs spend time instructing students in standards which should be taught at the Adult Basic Education level, such as basic operations, fractions, and decimals. Within the Common Core State Standards, these skills are located at the 4th grade level, rather than at the higher levels of the K-12 curriculum.

It is important to bridge this academic gap and develop a GED® curriculum that incorporates all of the following, higher-order standards. Only 25% of the current GED® Mathematics test questions assess number operation and number sense skills. However, unlike the types of basic numeracy skills often taught in the adult education classroom, the GED® test requires that students represent, analyze, and apply the various number operations and number sense skills. It's important to note that the majority of questions on the current GED® test assess skills in the areas of measurement and geometry; data analysis, statistics, and probability; and algebra, functions, and patterns.

Developing a GED® curriculum that focuses on each of the following types of higher-level mathematical skills, rather than primarily on basic number operations and number sense, is the first step in bridging the gap.

2002 Series GED® Mathematics Test Skills

Number Operations and Number Sense

- Represent and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, and scientific) in real-world and mathematical problem situations
- Represent, analyze, and apply whole numbers, decimals, fractions, percents, ratios, proportions, exponents, roots, and scientific notation in a wide variety of situations
- Recognize equivalencies and order relations for whole numbers, fractions, decimals, integers, and rational numbers
- Select the appropriate operations and sequence to solve problems (for example, *When should I divide?*)
- Relate basic arithmetic operations to one another
- Calculate with mental math, pencil and paper, and a scientific calculator using whole numbers, fractions, decimals, and integers
- Use estimation to solve problems and assess the reasonableness of an answer

Measurement and Geometry

- Model and solve problems using the concepts of perpendicularity, parallelism, congruence, and similarity of geometric figures
- Use spatial visualization skills to describe and analyze geometric figures and translations/rotations of such figures
- Use the Pythagorean Theorem to model and solve problems
- Find, use, and interpret the slope of a line, the y -intercept of a line, and the intersection of two lines
- Use coordinates to design and describe geometric figures
- Identify and select appropriate units of metric and customary measures
- Convert and estimate units of metric and customary measure (all conversions within systems)
- Solve and estimate solutions to problems involving length, perimeter, area, surface area, volume, angle measurement, capacity, weight, and mass
- Use uniform rates (e.g., miles per hour, bushels per acre) in problem situations
- Read and interpret scales, meters, and gauges
- Predict the impact of changes in linear dimension on the perimeter, area, and volume of figures

Data Analysis, Statistics, and Probability

- Construct, interpret, and draw inferences from tables, charts, and graphs
- Make inferences and convincing arguments that are based on data analysis
- Evaluate arguments that are based on data analysis, including distinguishing between correlation and causation
- Represent data graphically in ways that make sense and are appropriate to the context
- Apply measures of central tendency (mean, median, mode) and analyze the effect of changes in data on these measures
- Use an informal line of “best fit” to develop a prediction from data
- Apply and recognize sampling and bias in statistical claims
- Make predictions that are based on experimental or theoretical probabilities, including listing possible outcomes
- Compare and contrast different sets of data on the basis of measures of central tendency and dispersion

Algebra, Functions, and Patterns

- Analyze and represent situations involving variable quantities with tables, graphs, verbal descriptions, and equations
- Recognize that a variety of problem situations may be modeled by the same function or type of function (e.g., $y = mx + b$, $y = ax^2$, $y = a^x$, $y = 1/x$)
- Convert between different representations, such as tables, graphs, verbal descriptions, and equations

- Create and use algebraic expressions and equations to model situations and solve problems
- Evaluate formulas
- Solve equations, including first degree, quadratic, power, and systems of linear equations
- Recognize and use direct and indirect variation
- Analyze tables and graphs to identify and generalize patterns and relationships
- Analyze and use functional relationships to explain how a change in one quantity results in change in another quantity, including linear, quadratic, and exponential functions

The Technical Manual: 2002 Series GED® Tests (March 2009). GED Testing Service®. American Council on Education™.

Overview of Skills Assessed by the 2002 Series GED® Language Arts, Writing Test

The content of the GED® Language Arts, Writing Test is also based on 1999 standards for high school English Language Arts programs throughout the United States. These standards will be replaced by the more rigorous Common Core State Standards in 2014. Effective writing skills are a necessity in today's world of work, as well as in postsecondary education and training programs.

Many programs focus on teaching grammar skills through worksheets and writing through one type of structure – the five paragraph essay. However, both postsecondary education and the workplace require different structural formats, as well as the ability to communicate based on specific audiences and purposes. This requires that GED® programs explicitly teach different writing structures, such as business documents, various types of essays, research documents, note-taking skills, and short-answer responses. A missing piece in the writing process is a student's ability to provide evidence and support within various types of text. Instead of using the five-paragraph essay structure as the only structure taught, current GED® curriculum should also teach college and business writing structures.

Another missing piece is the ability to edit and revise. Research supports that the most effective way of teaching grammar is within the context in which it is used, such as editing and revising a business document or a letter of application to a college. Part I of the GED® Language Arts, Writing Test directly measures proofreading and editing skills based on different document types. Each document, when corrected, is an example of good writing. Question types include: correction, revision, and construction shift items. The errors to be corrected assess a student's ability to edit and revise within one sentence, a number of sentences, a complete paragraph, or the text as a whole – skills similar to those needed in real-world situations.

Providing direct and explicit instruction in contextualizing grammar and integrating different types of writing assignments are two strategies that can be incorporated to teach the skills that are currently included on the GED® Language Arts, Writing Test. These strategies can begin to bridge the academic gap that exists in the area of writing.

GED® Language Arts, Writing Test, Part I

Skills assessed by the Language Arts, Writing Test, Part I include:

- **Organization:** Items that require editing and revision of a document by adding, removing, or repositioning sentences. Organizational skills include:
 - effective text divisions (within or among paragraphs forming new paragraphs within multi-paragraph documents, and combining paragraphs to form a more effective document)
 - topic sentences
 - unity/coherence
- **Sentence Structure:** These types of items include:
 - sentence fragments
 - run-on sentences
 - comma splices
 - improper coordination and subordination
 - modification
 - parallel structure
- **Usage:** Areas assessed include:
 - subject-verb agreement (including agreement in number, interrupting phrases, and inverted structure)
 - verb tense errors (including sequence of tenses, word clues to tense in sentences, word clues to tense in paragraphs, and verb form)
 - pronoun reference errors (including incorrect relative pronouns, pronoun shift, vague or ambiguous references, and agreement with antecedents)
- **Mechanics:** Areas assessed include:
 - capitalization (including proper names and adjectives, titles, and months/seasons)
 - punctuation (including commas in a series, commas between independent clauses joined by a conjunction, introductory elements, appositives, and the overuse of commas)
 - spelling (restricted to errors related to possessives, contractions, and homophones)

GED® Language Arts, Writing Test, Part II

Part II of the Language Arts, Writing Test measures the examinee's ability to write on a single expository topic and carries a time limit of 45 minutes. A specific length is not required. Instead, the effectiveness of the writing is assessed holistically via a four-point rubric that determines the writing sample to be Inadequate, Marginal, Adequate, or Effective. Currently, the national average for a GED® essay is one that is marginal. This level of essay is not adequate for transitioning to the workplace or postsecondary education and training.

The Technical Manual: 2002 Series GED® Tests (March 2009). GED Testing Service®. American Council on Education™.

Overview of Skills Assessed by the 2002 Series GED® Social Studies Test, Science Test, and Language Arts, Reading Test

Students need effective reading comprehension skills, as well as content or background knowledge to successfully complete the GED® Social Studies, Science, and Language Arts, Reading Tests. Many adult learners are ineffective readers. Not only does this impact their ability to pass the GED® test, but also their ability to successfully navigate the world of work and access to postsecondary education and training.

As with other academic areas, the missing piece in reading comprehension is the necessary time required to provide direct and explicit instruction for the development of pre-, during-, and post-reading strategies, vocabulary development, background knowledge, and reading rate and fluency. GED® programs should provide students with reading materials in diverse subject areas that are written primarily at a 9.0-12.9 readability level. Many of the current materials used in the classroom have a readability level below a 9.0 making them appropriate for adult basic education programs.

Effective GED® programs should teach students different reading strategies that can be used with different types of text. Students need strategies as they are skimming and scanning text, as well as completing a careful or intensive reading of a passage. Content or background knowledge is also an important part of the comprehension process. To get started in developing materials for “missing pieces” in social studies, science, fiction and non-fiction readings, it is important to identify the different content on the GED® Social Studies, Science, and Language Arts, Reading Tests.

GED® Social Studies Test

The Social Studies Test measures an examinee’s skill in understanding, interpreting, and applying key history, geography, economics, and civics and government concepts and principles. Content included on the GED® Social Studies Test includes:

- U.S. History
 - Beginnings to 1820 (Native Peoples, Colonization, Settlement, Revolution, the New Nation)
 - 1801–1900 (Expansion, Reform, Civil War, Reconstruction, Industrial Development)
 - 1890–present (Emergence of Modern America, Great Depression, World War II, Postwar United States, Contemporary United States)
- World History
 - Beginnings–1000 B.C. (Beginnings and Early Civilizations) 1000 B.C.–300 B.C. (Classical Traditions, Empires, Religions)
 - 300 B.C.–A.D. 1770 (Growing Trade, Hemispheric Interactions, First Global Age)
 - 1750–1914 (Age of Revolutions)
 - 1900–present (Urbanization; World Wars; Global Depression; Advances in Science and Technology; New Democracies of Africa, Asia, South America; the Cold War; “Global Culture”)
- Civics and Government
 - Civic Life, Politics, Government; Foundations of the American Political System
 - American Government
 - Relationship of United States to Other Nations; and the Roles of Citizens in American Democracy

- Geography
 - World in Spatial Terms
 - Places and Regions
 - Physical Systems
 - Human Systems
 - Environment and the Society
 - Uses of Geography
- Economics
 - Economic Reasoning and Choice
 - Comparison of Economic Systems, Business in a Free Enterprise System, Production, Consumers
 - Financial Institutions
 - Government's Role in the Economy, Labor and the Economy, Global Markets, and Foreign Trade

The Technical Manual: 2002 Series GED® Tests (March 2009). GED Testing Service®: American Council on Education™.

GED® Science Test

The Science Test items are designed to measure an examinee's skills and knowledge in the content areas of life science, physical science (physics and chemistry), and Earth and space science. The Science Test measures the major and lasting expected outcomes of a sound, well-rounded high school science education. These outcomes include the acquisition of a broad knowledge base and the ability to use a range of reasoning skills. Test items focus on the comprehensive, integrated skills typical of what the examinee must know, understand, and be able to perform in order to be scientifically literate.

Basic content for each of the areas of science are:

- Physical Science
 - Structure of atoms
 - Structure and properties of matter
 - Chemical reactions
 - Motions and forces
 - Conservation of energy and increase in disorder
 - Interactions of energy and matter
- Life Science
 - The cell
 - Molecular basis of heredity
 - Biological evolution
 - Interdependence of organisms
 - Matter, energy, and organization in living systems
 - Behavior of organisms
- Earth and Space Science
 - Energy in the Earth system
 - Geochemical cycles
 - Origin and evolution of the Earth system
 - Origin and evolution of the universe

The Technical Manual: 2002 Series GED® Tests (March 2009). GED Testing Service®; American Council on Education™.

GED® Language Arts, Reading Test

The Language Arts, Reading Test is a passage-based, multiple-choice test that measures the student's ability to comprehend and interpret literary and workplace reading selections and to apply those interpretations to new contexts. The content of the Language Arts, Reading Test reflects the variety of texts a high school student encounters, both literary and non-fiction types of texts.

Selections are from:

- Literary texts
 - Poetry
 - Drama
 - Prose fiction
- Nonfiction texts
 - Nonfiction prose
 - Critical reviews of visual or performing arts
 - Workplace and community documents, such as mission and goal statements, rules for employee behavior, legal documents, memos, letters, excerpts from manuals, etc.

The Technical Manual: 2002 Series GED® Tests (March 2009). GED Testing Service®; American Council on Education™.

Integrating Critical Thinking Skills into the GED® Curriculum

If students are to be successful on the high-stakes tests, such as the GED® test, ACT, SAT, COMPASS®, or Accuplacer®, and to be successful in solving problems in real-world situations, they must be proficient at using critical thinking skills. However, adult learners often have not had sufficient opportunities to hone their critical thinking skills. Instead, adult learners often:

- Reach a conclusion without ever looking for much less at the available evidence. Students need to first review the facts and then draw conclusions based on the facts, not their own personal feelings.
- Disagree with a logical conclusion. Rather than accept that they may be wrong, students may disagree with a specific conclusion even though there is no logic to their line of reasoning.
- Choose the most familiar answer on an assessment. If faced with a series of multiple choice answers, students will often select the one that looks the most familiar, rather than reviewing all of the answers and reading the text for an appropriate answer. Students may look for a key word they know and then assume that it is the correct answer, even though it may be unrelated to the topic.

- Disregard information that would disprove their theory. As with disagreeing with a logical conclusion, some students refuse to change their own opinion or theory about a specific concept or idea because it is counter to their own preconceived notions.
- Fail to notice details. Students overlook details, especially if they are confronted with both prose and visual information. These details can prove useful to students, but are often overlooked because the correct response is embedded in the graphics.
- Refuse to consider other points of view. For these students, it is a case of “my way or the highway.” They cannot conceive of a different point-of-view and may have difficulty moving from “present-mindedness” to look at a more historical point-of-view.
- Guess rather than think. For some students, it appears more expedient to guess if the answer is not immediately recognizable.
- Make general assumptions about a specific outcome rather than basing their decisions on the evidence.
- Base opinions of credibility on the speaker, not the evidence. One needs to look no further than advertising to see the impact of an authority figure on how students develop their opinions about a specific topic. Nike has sold millions of shoes based on the credibility of Michael Jordan, as opposed to how well the shoes are made and will perform.

To assist students to become effective thinkers and problem solvers, teachers must spend time in class working with students on a variety of question types. Students need to recognize key vocabulary words that will help them identify the types of thinking skills they need in order to answer specific questions and/or solve problems.

To get started integrating critical thinking skills into the classroom, you will want to:

- Help students gain their own questioning skills. Have students formulate a series of questions about a specific passage that they have read. Provide each student with a copy of the same text and have them develop three to five questions that they can then share with their fellow students.
- Help students look for details and evidence. Take time to preview text with students, pointing out the format of the text, key vocabulary words, and captions that accompany photographs or other graphics.
- Ask several questions. Develop questions that you want students to answer. Do not limit yourself to the basics of who, what, when, and where but more on the “how” and “why” that can be concluded based on the information provided in a passage or text. If you have difficulty thinking of higher-order questions, use the question starters included in this guide.
- Connect learning to students’ experiences in a contextual situation. Make learning more relevant by using real-life situations to explain more complex concepts and principles. Students have a wealth of real-life experiences. Use those experiences to better explain text to students. Have students draw their own comparisons based on personal experiences.

- Move students from knowledge to evaluation by providing events of learning, increase inductive and deductive questions, use more analogies and metaphors, and provide direct instruction with cooperative questioning.

Four Levels for Learning

There are four levels at which students learn.

1. Facts – students acquire information. Unfortunately, studies show that unless facts are continuously applied, there is a 90% loss over time. Also, “just the facts” leaves little opportunity for motivation.
2. Concepts – students process information and develop understanding of how information is related. There is less of an opportunity for loss and more opportunity for motivation through the use of concepts.
3. Personal Meaning – students integrate and internalize learning. This type of learning is more likely to endure over time and provides the greatest opportunity for motivation.
4. Comprehensive Learning – students experience significant lasting changes in attitudes and in their ability to do more and continue the learning process with this type of learning.

To assist students in developing critical thinking skills, they must move from acquiring information to integrating and internalizing their learning in order to apply the information to different situations and scenarios.

How Do I Get Started?

To get started in assessing where the missing pieces are in your GED® curriculum, review the content of each of the GED® subtests, as well as the level of critical thinking skills required in the program. This is the first step in developing a GED® bridge curriculum that better prepares all students for success on the GED® test, as well as transitioning to Michigan’s Transition program, today’s workplace, and postsecondary education and training programs. Once you have identified the missing pieces, it’s time to develop a syllabi, instructional strategies, and lesson plans that address each of the missing pieces.

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