



Georgia Assessments for the Certification of Educators®



GACE® Study Companion

Instructional Technology

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About the Assessment

Assessment Name	Instructional Technology
Grade Level	P–12
Test Code	302
Testing Time	3 hours
Test Duration	3.5 hours
Test Format	Computer delivered
Number of Selected-response Questions	100
Question Format	The test consists of a variety of short-answer questions such as selected-response questions, where you select one answer choice or multiple answer choices (depending on what the question asks for), questions where you enter your answer in a text box, and other types of questions. You can review the possible question types in the <i>Guide to Taking a GACE Computer-delivered Test</i> .
Number of Constructed-response Questions	4

The GACE Instructional Technology assessment is designed to measure the professional knowledge of prospective Instructional Technology Coordinators in the state of Georgia.

The testing time is the amount of time you will have to answer the questions on the test. Test duration includes time for tutorials and directional screens that may be included in the test.

The questions in this assessment assess both basic knowledge across content areas and the ability to apply principles.

The total number of questions that are scored is typically smaller than the total number of questions on the test. Most tests that contain selected-response questions also include embedded pretest questions, which are not used in calculating your score. By including pretest questions in the assessment, ETS is able to analyze actual test-taker performance on proposed new questions and determine whether they should be included in future versions of the test.

Content Specifications

This assessment is organized into content **subareas**. Each subarea is further defined by a set of **objectives** and their **knowledge statements**.

- The objectives broadly define what an entry-level educator in this field in Georgia public schools should know and be able to do.
- The knowledge statements describe in greater detail the knowledge and skills eligible for testing.
- Some tests also include content material at the evidence level. This content serves as descriptors of what each knowledge statement encompasses.

See a breakdown of the subareas and objectives in this assessment on the following pages.

Test Subareas

Subarea	Approx. Percentage of Test
I. Program Development, Implementation, and Evaluation	19%
II. Teaching, Learning, and Assessment	30%
III. Locating, Selecting, and Evaluating Digital Resources	15%
IV. Digital Citizenship	11%
V. Analysis (constructed response only)	25%

Test Objectives

Subarea I: Program Development, Implementation, and Evaluation

Objective 1: Leads the development and implementation of a shared vision for the use of technology

The beginning Instructional Technology Coordinator:

- A. Collaborates with stakeholders to identify goals, objectives, and methods for achieving a shared vision and strategic plan for the use of technology
- B. Uses multiple sources of data to inform the development of a vision and strategic plan; e.g., student performance data, district demographics, analysis of needs, surveys, infrastructure requirements
- C. Aligns the vision and strategic plan with the policies, practices, and goals of governing entities and district, state, and federal technology plans and guidelines
- D. Promotes the implementation and ongoing support of the vision and strategic plan among stakeholders
- E. Gathers, organizes, and analyzes information to assess progress in achieving the vision and strategic plan
- F. Applies knowledge of leadership skills in school and community contexts to facilitate the development and implementation of the vision and strategic plan; e.g., group dynamics, team building, change process
- G. Knows alternate means of funding for supporting the implementation of the strategic plan; e.g., grants, donations, corporate sponsorships
- H. Designs and implements advocacy strategies for the communication and promotion of instructional technology programs

Objective 2: Develops and evaluates technology-based professional learning programs

The beginning Instructional Technology Coordinator:

- A. Knows how to conduct a needs assessment; e.g., identifying a purpose, selecting data collection methods, synthesizing results
- B. Uses multiple sources of data to conduct needs assessments; e.g., standards comparisons, student assessment results, inventories
- C. Uses the results of needs assessments to inform the content and delivery of technology-related professional learning programs.
- D. Develops and implements technology-based professional learning that aligns with district, state, and national professional learning standards; e.g., Georgia Technology Standards for Teachers, International Society for Technology Education Standards (ISTE), Learning Forward
- E. Applies adult learning theory in individual and group professional development settings.
- F. Identifies and addresses barriers to effective professional learning among adult learners; e.g., level of prior knowledge, level of motivation, cyber phobia
- G. Monitors and adjusts professional learning in response to learner feedback
- H. Uses the results from professional learning programs to evaluate the effectiveness of the programs and to inform future programs; e.g., teacher content knowledge, pedagogical skills, student outcomes

Subarea II: Teaching, Learning, and Assessment

Objective 1: Integrates current and emerging technology into teaching, learning, and assessment

The beginning Instructional Technology Coordinator:

- A. Applies district, state, and national standards to instructional and program planning; e.g., Georgia Instructional Technology Standards, ISTE Standards
- B. Applies research-based best practices to instructional design, learning experiences, and the use of digital tools and resources
- C. Models and facilitates the use of a variety of digital tools and resources; e.g., audio and video components
- D. Coaches teachers in and models the design and implementation of authentic learning experiences using digital tools and resources; e.g., researching real-world problems, assuming professional roles, collaborating with others
- E. Coaches teachers in and models instructional activities that develop complex cognitive processes; e.g., problem solving, metacognition, critical and creative thinking
- F. Models and facilitates the appropriate use of technology to differentiate instruction that meet the needs of learners with diverse strengths, needs, and abilities

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- G. Coaches teachers in and models how to use technology for collaborative teaching and learning strategies; e.g., cooperative learning, interdisciplinary units, co-teaching, distance learning
 - H. Knows strategies for searching, retrieving, and interacting with information; e.g., Boolean logic, controlled versus natural language, keyword and phrase searching
 - I. Models and facilitates the use of digital tools and resources to collect, analyze, interpret, and communicate student achievement data
 - J. Uses digital assessment tools and resources to inform the instructional process; e.g., student response systems, online assessments, computer-based assessments

Objective 2: Creates and supports digital age learning environments

The beginning Instructional Technology Coordinator:

- A. Applies the principles and strategies of classroom management appropriate for digital learning settings; e.g., routines and procedures, positive learning environment, arrangement of space
- B. Prepares and maintains a variety of digital tools and resources for teacher and student use
- C. Provides support to students, faculty, staff, and administrators in the use of digital tools and resources; e.g., basic troubleshooting, instruction on use, mentoring
- D. Collaborates with teachers to determine the appropriate extent, level, or type of technology integration for meeting specific learning objectives
- E. Develops, models, and facilitates the use of online and blended learning, digital content, and learning networks
- F. Facilitates the use of adaptive and assistive technologies; e.g., voice-to-text, assistive listening systems, concept mapping software
- G. Provides basic troubleshooting for software and hardware problems common in digital learning environments
- H. Assists students and teachers in the use of digital communication and collaboration tools to communicate locally and globally
- I. Knows how to use software and hardware, operating systems, and networking components in a variety of settings; e.g., classrooms, laboratories, offices

Objective 3: Engages in professional growth and development

The beginning Instructional Technology Coordinator:

- A. Knows the purpose and function of professional organizations relating to instructional technology; e.g., Georgia Educational Technology Consortium (GaETC), Georgia Association for Instructional Technology, International Society for Technology Education, Association for Educational Communications and Technology

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- B. Accesses information on research, issues, and emerging trends relating to instructional technology and the digital world; e.g., Education Resources Information Center (ERIC), *Educational Technology Research and Development*, *Journal of Research on Technology in Education*, Galileo
 - C. Interprets and applies research, issues, and emerging trends relating to instructional technology to a variety of educational situations and settings
 - D. Participates in professional development practices to improve personal productivity and professional practice; e.g., learning communities, peer coaching, conferences and workshops
 - E. Uses reflective practice to improve the ability to model and facilitate technology-enhanced learning experiences; e.g., portfolios, journals, critical incident analysis
 - F. Understands the instructional technology coordinator's role as a resource for parents/caregivers, school personnel, and members of the community for information relating to instructional technology
 - G. Understands terminology, including jargon, relating to digital technology and the digital community; e.g., podcast, pop-up, cloud-based, Web 3.0

Subarea III: Locating, Selecting, and Evaluating Digital Resources

Objective 1: Selects and guides others in the selection of digital resources and systems

The beginning Instructional Technology Coordinator:

- A. Knows how to locate digital tools and resources; e.g., commercial vendors, professional journals, online resources
- B. Knows major educational technology awards; e.g., Best Educational Software Award (BESSIE), Association for Library Service to Children/Notable Computer Software, American Association of School Librarians, Best Websites for Teaching & Learning
- C. Assists faculty and administrators in locating and selecting digital tools and resources for educational use; e.g., instructional software and applications, learning management systems (LMS), online grade books
- D. Assists faculty, staff, and administrators in locating and selecting digital tools and resources for data and systems management; e.g., student information system, scheduling, admissions
- E. Assists faculty, staff, and administrators in establishing and using communication and collaboration tools; e.g., teacher websites, email networks, smart phone applications

Objective 2: Evaluates and guides others in the evaluation of digital tools, resources, and systems

The beginning Instructional Technology Coordinator:

- A. Uses standard review sources for digital tools and resources; e.g., *Children's Technology Review*, *School Library Journal*, content specific professional journals

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- B. Applies a number of criteria to evaluate digital tools and resources; e.g., accuracy, suitability, usefulness
 - C. Applies a number of criteria to evaluate digital systems; e.g., functionality, technology specifications, pricing
 - D. Uses a variety of methods to involve decision makers and end users in the evaluation of resources; e.g., pilot programs, vendor demonstrations, focus groups
 - E. Uses a variety of tools to gather input from decision makers and end users on the effectiveness of resources; e.g., questionnaires, surveys, anecdotal records

Subarea IV: Digital Citizenship

Objective 1: Models and promotes the equitable, ethical, and legal use of information and technologies

The beginning Instructional Technology Coordinator:

- A. Identifies issues and barriers relating to equal access to digital tools, resources, and practices; e.g., digital divide, funding for technology, types of use
- B. Models and promotes strategies for achieving equitable access to digital tools, resources, and practices; e.g., race and gender balance, loaner programs, bias-free evaluation criteria
- C. Models and promotes strategies for ensuring physical access to digital tools, workstations, and laboratories; e.g., compliance with the Americans with Disabilities Act (ADA), universal design, faculty and staff training
- D. Models and promotes appropriate behaviors associated with digital communication; e.g., netiquette, use of emoticons, texting
- E. Uses digital communication and collaboration tools to promote diversity, cultural understanding, and global awareness; e.g., voice over Internet protocol (VoIP), social networking, tweeting

Objective 2: Models and promotes safe and responsible use of digital information and technologies

The beginning Instructional Technology Coordinator:

- A. Works with administrators to develop and implement policies and procedures relating to the use of technology in educational settings; e.g., acceptable use, bring your own device/tech (BYOD/BYOT)
- B. Understands safety and security issues relating to the use of digital technology; e.g., cyber bullying, identity theft, predation
- C. Understands health issues relating to the use of digital technology; e.g., eye strain, neck pain, fatigue
- D. Understands ethical issues relating to the use of and access to digital technology; e.g., plagiarism, privacy, file sharing

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- E. Understands laws relating to the use of and access to digital technology; e.g., Children's Internet Protection Act (CIPA), Family Educational Rights and Privacy Act (FERPA), Georgia statutes, copyright

Subarea V: Analysis

Objective 1: Program Development, Implementation, and Evaluation

The beginning Instructional Technology Coordinator:

- A. Knows how to use input from stakeholders, data, policies, and laws to plan, implement, and evaluate strategic technology plans

Objective 2: Teaching, Learning, and Assessment

The beginning Instructional Technology Coordinator:

- A. Knows how to use a variety of digital tools and resources
- B. Knows how to incorporate standards and best practices to instruct students and staff in the operation and use of a variety of digital tools and resources for instructional and managerial applications

Objective 3: Locating, Selecting, and Evaluating Digital Resources

The beginning Instructional Technology Coordinator:

- A. Knows how to locate, select, and evaluate a variety of digital resources for educational use and data and systems management

Objective 4: Digital Citizenship

The beginning Instructional Technology Coordinator:

- A. Knows strategies for and instructs others in achieving equitable access to digital tools and resources
- B. Knows and instructs others in the safe, ethical, and legal use of digital tools and resources

Practice Questions

The practice questions in this study companion are designed to familiarize you with the types of questions you may see on the assessment. While they illustrate some of the formats and types of questions you will see on the test, your performance on these sample questions should not be viewed as a predictor of your performance on the actual test. Fundamentally, the most important component in ensuring your success is familiarity with the content that is covered on the assessment.

To respond to a practice question, choose one of the answer options listed. Be sure to read the directions carefully to ensure that you know what is required for each question. You may find it helpful to time yourself to simulate actual testing conditions. A correct answer and a rationale for each sample test question are in the section following the practice questions.

Keep in mind that the test you take at an actual administration will have different questions, although the proportion of questions in each subarea will be approximately the same. You should not expect the percentage of questions you answer correctly in these practice questions to be exactly the same as when you take the test at an actual administration, since numerous factors affect a person's performance in any given testing situation.

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1. Instructional technology coordinators need to be aware of the Individuals with Disabilities Education Act (IDEA) because
 - A. they assist in providing accommodations for students with Individualized Education Programs (IEPs).
 - B. their computer technology programs may qualify for additional funds, depending on the number of students with disabilities in the school.
 - C. they identify students with disabilities from among the general school population.
 - D. they are required to design parallel curriculums for students with disabilities.

Answer and Rationale

2. An instructional technology coordinator is presenting a workshop to help teachers set up individual Web pages for posting on the district's website. The presentation should contain a caution about which of the following practices?
 - A. Posting homework assignments and test dates
 - B. Hyperlinking to Web pages containing class-related resources
 - C. Publishing students' classwork
 - D. Including a calendar showing class and school events

Answer and Rationale

3. Which of the following is an ergonomic concern of an instructional technology coordinator observing students at work in the computer lab?
 - A. Are the students looking at their fingers as they strike the keyboard?
 - B. Is the filtering software preventing students from accessing harmful text and images?
 - C. Are the students positioning their chairs and feet properly to provide adequate support?
 - D. Are the students producing a work product that demonstrates creative or critical thinking?

Answer and Rationale

-
4. Which of the following documents is the best guide for determining whether a digital resource is being used legally?
- A. Its licensing agreement
 - B. Its warranty
 - C. The district's acceptable use policy
 - D. The ISTE Code of Professional Conduct and Ethics

Answer and Rationale

5. Full text is a valuable feature of an online periodicals database because it
- A. displays graphics as well as text.
 - B. provides access to articles in their entirety.
 - C. displays the periodical exactly as it appears in print.
 - D. allows searching using Boolean operators.

Answer and Rationale

6. Which of the following features of an online grade book system is most likely to benefit students?
- A. Supporting transparent, constructive relationships between teachers and parents
 - B. Safeguarding against discrepancies between grades written on papers and grades recorded online
 - C. Providing students and parents with constant access to grades
 - D. Showing the immediate impact of a missed assignment on students' cumulative grades

Answer and Rationale

-
7. A school district is seeking a computer application that delivers training to learners and tracks their progress. Which of the following applications best meets the district's need?
- A. Learning management system
 - B. Content management system
 - C. Student information software
 - D. Enterprise content software

Answer and Rationale

8. Which of the following is the best reason for an instructional technology coordinator to join a professional association?
- A. To become acquainted with the leaders in the profession
 - B. To participate in a forum for professional discourse and discussion
 - C. To gain entrance to association gatherings and meetings
 - D. To be eligible to receive grants and scholarships offered by the association

Answer and Rationale

9. Which of the following is the primary function of an educator's reflective journal?
- A. To conduct an internal dialogue about the planning, delivery, and outcomes of teaching
 - B. To recall the educator's experiences of being a student and being taught
 - C. To describe what happened during a particular lesson or course of study
 - D. To apply research to lesson design and delivery

Answer and Rationale

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10. Which of the following cables provides both a communications connection and power supply between personal computers and peripherals?
- A. HDMI
 - B. Fiber-optic
 - C. Parallel port
 - D. USB

Answer and Rationale

11. In which of the following situations is it most appropriate for an instructional technology coordinator to use an LCD projector?
- A. Publishing a newsletter with high-resolution graphics
 - B. Setting up a survey for multiple participants to enter comments
 - C. Creating a chart displaying the distribution of school technology funds
 - D. Giving a presentation about a proposed redesign of the computer labs

Answer and Rationale

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12. Which of the following is the best advice an instructional technology coordinator can give to staff members who receive an error message while operating a computer program?
- A. Record the message and contact the technology staff
 - B. Turn the computer off, wait 30 seconds, then turn the computer on
 - C. Check to see if anyone else has received the same message
 - D. Close the error window and try to continue the program

Answer and Rationale

13. Setting the features of a particular software program according to personal likes, dislikes, and ease of operation is called
- A. customizing.
 - B. querying.
 - C. certifying.
 - D. licensing.

Answer and Rationale

14. A user would use truncation during an Internet search to
- A. narrow the search.
 - B. increase the accuracy of the search.
 - C. represent variant forms of the same word.
 - D. represent homonyms with a single term.

Answer and Rationale

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15. Ms. Neeson, a first-grade teacher, asks the instructional technology coordinator to help her plan a lesson to teach students how to insert clip art into a document. After collaborating on a lesson plan, the coordinator can best support Ms. Neeson by
- A. writing step-by-step instructions for her to follow as she teaches.
 - B. bookmarking sites for copyright-free clip art.
 - C. offering to co-teach the lesson with her.
 - D. providing exemplars to serve as models for students.

Answer and Rationale

16. Which of the following actions by an instructional technology coordinator is most likely to support the success of English-language learners (ELLs) in computer education classes?
- A. Using teaching materials from a lower grade level
 - B. Preteaching content-related vocabulary
 - C. Using nonverbal cues when speaking
 - D. Asking students frequently if they have any questions

Answer and Rationale

17. An instructional technology coordinator often holds workshops to help teachers learn to use emerging technology. Which of the following practices is likely to make professional development for teachers most valuable?
- A. Focusing instruction on gaining content rather than solving problems
 - B. Asking participants to set aside their past experiences and prior knowledge
 - C. Pacing instruction quickly to keep up with adults' rapid learning rate
 - D. Involving participants in determining the learning objectives

Answer and Rationale

-
18. Which of the following is a function of a technology education advisory committee?
- A. Approving technology education programs for inclusion in the curriculum
 - B. Improving the management, implementation, and evaluation of technology education programs
 - C. Acting as a policy-making body on issues related to technology
 - D. Training students and staff to use technology equipment and applications

Answer and Rationale

19. Which of the following elements of the ISTE Code of Ethical Conduct for Computer-Using Educators can an instructional technology coordinator cite as the best justification for a district's professional training program?
- A. I have varying degrees of responsibility for the development of policy that guarantees the proper use of computerized information in the school's possession.
 - B. I support that each teacher must have a minimum level of general computer literacy, including skills and knowledge about computers appropriate to the classroom setting and subject area.
 - C. I support and encourage policies that extend equitable computer access to all students, and I will actively support well-reasoned programs and policies that promote such use.
 - D. I will encourage parental involvement in long-term planning of computer use and coordinate expectations for computer use between home and school.

Answer and Rationale

Questions 20-22 refer to the following passage.

A school principal asks Mr. Fergus, the instructional technology coordinator, to conduct a needs assessment to determine how grant money should be spent to increase users' access to online information resources in the computer labs and the library media center.

20. Which of the following should be Mr. Fergus' initial step in conducting a needs assessment?
- A. Designing a survey instrument
 - B. Identifying a survey population
 - C. Clarifying the purpose of the assessment
 - D. Collecting data

Answer and Rationale

21. In which of the following ways will the data gathered from the needs assessment be valuable to Mr. Fergus and the school community as a whole?
- A. Identifying populations whose needs are not being met
 - B. Providing students with feedback on their performance
 - C. Evaluating the effectiveness of the resources already available
 - D. Planning professional development

Answer and Rationale

22. Which of the following information sources is most likely to provide Mr. Fergus with data about the opinions and attitudes of the members of the school community toward the resources currently available in the computer labs and the library media center?
- A. Focus groups
 - B. Standardized test scores
 - C. School progress reports
 - D. Report card analyses

Answer and Rationale

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23. Mr. Lester is an instructional technology coordinator who spends one day a week at each of the five elementary schools in the district. He relies heavily on the district's computer paraprofessionals to perform certain duties when he is not present. Which of the following is the most effective method Mr. Lester can use to train new paraprofessionals?
- A. Holding monthly training sessions with new paraprofessionals
 - B. Having each new paraprofessional shadow an experienced paraprofessional
 - C. Compiling a training manual for new paraprofessionals
 - D. Designing an aptitude test for potential paraprofessionals

Answer and Rationale

24. Which of the following features of an online grading system is most likely to appeal to teachers?
- A. Easy setup
 - B. Tools for integrating charts and graphs
 - C. Nonnumeric grading options
 - D. Remote access

Answer and Rationale

25. Mr. Bloom, a high school science teacher, asks the instructional technology coordinator to reserve the computer lab for the first, third, and fifth teaching periods every day for two weeks so his students can do research. He also requests that no other students be allowed in the lab while his students are working.

Which of the following is the coordinator's first step in considering Mr. Bloom's request?

- A. Deciding if the students will be able to locate sufficient resources to meet their needs
- B. Confirming that Mr. Bloom's research topics align with state standards for science
- C. Determining the extent to which Mr. Bloom's plan will affect access to the computer lab by other users
- D. Checking the staffing schedule to make sure students can be adequately supported as they work

Answer and Rationale

Answer Key and Rationales

Question Number	Correct Answer	
1	A	<p>Option (A) is correct. The instructional technology coordinator may be asked to advise IEP teams about the selection of assistive and adaptive technology and to provide technology training for teachers, students, and families.</p> <p><i>Back to Question</i></p>
2	C	<p>Option (C) is correct. The Family Educational Rights and Privacy Act (FERPA) restricts the information school districts can make public about students. Publication of students' work is not permitted.</p> <p><i>Back to Question</i></p>
3	C	<p>Option (C) is correct. Ergonomics is the science of designing and arranging things so they can be used easily and comfortably. The positioning of chairs and feet addresses users' ergonomics.</p> <p><i>Back to Question</i></p>
4	A	<p>Option (A) is correct. A licensing agreement is a legal document that outlines how a digital resource can be used.</p> <p><i>Back to Question</i></p>

Question Number	Correct Answer	Rationale
5	B	<p>Option (B) is correct. Viewing an article in its entirety is always preferable to an abstract or citation because it reduces the number of steps leading to information.</p> <p><i>Back to Question</i></p>
6	A	<p>Option (A) is correct. Parental effort is consistently associated with higher levels of student achievement.</p> <p><i>Back to Question</i></p>
7	A	<p>Option (A) is correct. A learning management system delivers online courses or training to learners, while managing students and keeping track of their progress and performance across all types of training activities.</p> <p><i>Back to Question</i></p>
8	B	<p>Option (B) is correct. Joining a professional association provides support and help in reaching professional goals. Associations sponsor events that allow professionals to share ideas, ask for advice, learn about trends and best practices, and meet and brainstorm with peers.</p> <p><i>Back to Question</i></p>

Question Number	Correct Answer	Rationale
9	A	<p>Option (A) is correct. A reflective journal is a written record of an educator's experiences of and feelings related to planning and delivering teaching and learning.</p> <p><i>Back to Question</i></p>
10	D	<p>Option (D) is correct. A USB cable is the most widely used hardware interface for communication between peripherals and a computer. It is also capable of transmitting power.</p> <p><i>Back to Question</i></p>
11	D	<p>Option (D) is correct. An LCD projector connects to a computer, allowing the computer's screen to be viewed by the entire class.</p> <p><i>Back to Question</i></p>
12	A	<p>Option (A) is correct. The error message provides information necessary for the technical staff to address the problem.</p> <p><i>Back to Question</i></p>

Question Number	Correct Answer	Rationale
13	A	<p>Option (A) is correct. Customizing allows a user to change the settings to fit a particular preference or task.</p> <p><i>Back to Question</i></p>
14	C	<p>Option (C) is correct. Truncation is used to show variant forms of the same word.</p> <p><i>Back to Question</i></p>
15	C	<p>Option (C) is correct. Research supports that best practice for training teachers in implementing a technology lesson is to have the technology expert alongside the teacher during delivery of the lesson.</p> <p><i>Back to Question</i></p>
16	B	<p>Option (B) is correct. Preteaching academic vocabulary helps English-language learners to identify words and to place them in a meaningful context.</p> <p><i>Back to Question</i></p>

Question Number	Correct Answer	Rationale
17	D	<p>Option (D) is correct. Adult learners are self-directed and intrinsically motivated. They are more likely to benefit from training if they are involved in determining the purpose of their learning.</p> <p><i>Back to Question</i></p>
18	B	<p>Option (B) is correct. Advisory committees are not ultimately responsible for approving programs, making policies, or delivering training; however, they take an active role in helping the school meet its goals and objectives for the technology program.</p> <p><i>Back to Question</i></p>
19	B	<p>Option (B) is correct. Principle IV in ISTE's Ethical Code for Computer-Using Educators states "in order to redefine the teacher's role in light of the integration of computers into classrooms, each teacher must have a minimum level of general computer literacy, including skills and knowledge about computers appropriate to the classroom setting and subject area."</p> <p><i>Back to Question</i></p>
20	C	<p>Option (C) is correct. The first step is establishing the purpose of the needs assessment. Is it to meet a legal requirement, an organizational requirement, or simply a desire for general information? The answer will determine the subsequent steps in the assessment.</p> <p><i>Back to Question</i></p>

Question Number	Correct Answer	Rationale
21	A	<p>Option (A) is correct. The goal of the needs assessment is to increase access to online resources. A likely result of the needs assessment is data identifying populations whose current access is inadequate.</p> <p><i>Back to Question</i></p>
22	A	<p>Option (A) is correct. A focus group is a small sample of people whose opinions are studied to learn the opinions that can be expected from a larger group.</p> <p><i>Back to Question</i></p>
23	B	<p>Option (B) is correct. Volunteers provide trainees with an important perspective on their work. Using volunteers as trainers benefits the volunteers as well by refreshing their skills and affirming commitment to their own volunteer work.</p> <p><i>Back to Question</i></p>
24	A	<p>Option (A) is correct. A major criticism teachers express is the difficulty setting up and using online grading systems. A system with easy setup and operation would likely appeal to teachers.</p> <p><i>Back to Question</i></p>
25	C	<p>Option (C) is correct. Providing the greatest access to the most users is the primary goal of any computer facility.</p> <p><i>Back to Question</i></p>

Constructed-response Questions

The purpose of this section is to describe the constructed-response questions that appear on the GACE Instructional Technology assessment and to explain the criteria used to score each constructed-response question. The test includes four constructed-response questions. Unlike the selected-response questions, the constructed-response questions require you to demonstrate your knowledge in a subject area by providing in-depth written responses.

Preparing for the Constructed-response Questions

When preparing for the constructed-response questions, read the sample questions and scoring guide carefully. You may wish to draft a response to each sample question by reading the question and planning, writing, and revising your essay. You should use a total of about 15 minutes for each constructed-response question. Also, because no reference materials will be available during the test, it is recommended that you refrain from using a dictionary, a thesaurus, or textbooks while writing your practice responses.

Once you have written your practice responses, reread the scoring guide, and then read the sample responses provided for each score level. Rationales that explain how the responses characterize the score point description are provided for each of the responses. After you have read through these materials, review your own responses in light of the score point descriptions. You may also wish to review your responses and the score scale with staff in your preparation program.

Scoring Guide

Readers will assign scores based on the following scoring guide.

Score	Description
3	<p>The response demonstrates a thorough understanding of the aspects of instructional technology relevant to the question.</p> <p>A response in this category:</p> <ul style="list-style-type: none">• Appropriately addresses all parts of the question• Shows a thorough understanding of any stimulus material presented• Exhibits a strong knowledge of students, subject matter, pedagogy, and/or facts relevant to the question• Provides strong explanations that are supported by details
2	<p>The response demonstrates a basic or general understanding of the aspects of instructional technology relevant to the question.</p> <p>A response in this category:</p> <ul style="list-style-type: none">• Appropriately addresses all or most parts of the question• Shows a general understanding of any stimulus material presented• Exhibits a basic knowledge of students, subject matter, pedagogy, and/or facts relevant to the question• Provides basic explanations that are somewhat supported by details
1	<p>The response demonstrates a weak or limited understanding of the aspects of instructional technology relevant to the question.</p> <p>A response in this category:</p> <ul style="list-style-type: none">• Appropriately addresses some parts of the question• Shows a weak understanding of any stimulus material presented• Exhibits a weak knowledge of students, subject matter, pedagogy, and/or facts relevant to the question• Provides weak explanations that are not well supported by details
0	<p>The response demonstrates little or no understanding of the aspects of instructional technology relevant to the question.</p> <p>A response in this category:</p> <ul style="list-style-type: none">• Fails to address appropriately any parts of the question or simply restates the prompt• Shows no understanding of any stimulus material presented• Exhibits no knowledge or has serious misconceptions of students, subject matter, pedagogy, and/or facts relevant to the question <p>Also receiving a score of 0 would be any responses that are blank, completely off-topic, or not written in English.</p>

Constructed-response Question 1

This constructed-response question asks you to analyze a teacher's lesson plan.

General Directions

Plan to use approximately 15 minutes to complete this question.

Read the constructed-response question carefully before you begin to write your response to ensure that you address all components. Think about how you will organize what you plan to write.

The final version of your response should conform to the conventions of standard written English. Your written response should be your original work, written in your own words, and not copied or paraphrased from some other work. You may, however, use citations when appropriate.

Sample Question

Ms. Mills teaches fifth-grade social studies. During her last observation conference, Ms. Mills' principal encouraged her to integrate technology into her lessons and directed her to Mr. Yee, the instructional technology coordinator, for assistance. She forwards Mr. Yee a copy of the lesson plan that she has used in the past to teach students map skills.

Lesson Plan

Title:	Types of Maps
Topic or Main Idea:	Different maps serve different purposes
Objectives:	Students will demonstrate the ability to <ol style="list-style-type: none">identify four different types of maps by their characteristics and purposeinterpret sample maps to answer questionscreate an original of each type of map
Standards:	Social Studies Skills Matrices, Map and Globe Skills, 4 and 6
Materials:	Textbook, pages 96–101 Q & A worksheet Sample maps: Political, physical, climate, resource Research materials: Atlases Map templates, colored pencils
Activity:	Assign students to mixed-ability groups. Hand each group copies of a different type of map. Give each group a Q & A worksheet. Have each group describe the purpose and characteristics of each type of map to the class while students take notes on the worksheet. Ask each group to show the class samples of different types of maps. Distribute map templates and research materials. Circulate among students as they create original maps.
Assessment:	Teacher observation, students' original maps

Identify THREE areas of Ms. Mills' lesson where she can integrate an aspect of digital technology.

For EACH element, describe

- how the technology will support, advance, or enrich learning for that element of the lesson
- how Mr. Yee can prepare or support Ms. Mills in using the technology effectively

Sample Responses and Rationales

Sample Response Earning a Score of 3

Mr. Yee should introduce Ms. Mills to a commercial mapmaking program, such as Mapmakers' Toolkit® or an online mapmaking website, such as Mapmaker Interactive. Mapmaking programs and websites allow students to select map outlines and complete them by adding a number of different features. Most mapmaking programs and websites allow students to integrate their maps into print or digital projects, such as the one Ms. Mills has planned. Aside from reinforcing students' technology skills, using the mapmaking programs and websites could form the basis of a class discussion about mapmaking techniques, e.g., hand-drawn maps versus digitally created maps, including the pros and cons of the different methods.

To support Ms. Mills, Mr. Yee should schedule at least two sessions to work one-on-one with Ms. Mills. During the first session, he could show her the basic operation of the program or website and ways she can use it with her students. He should then let her work with it on her own; then schedule another session where she can ask him questions or solve problems she encountered while working with the program.

An LCD projector to show students' maps to the class: Because mapmaking programs and websites allow students' maps to be stored digitally, they can be projected using the LCD projector. This will enable the students to see their classmates' work more clearly, and will also allow either the students or Ms. Mills to make changes to or notations on the maps while they are projected.

Mr. Yee can support Ms. Mills by setting up the LCD projector in advance of the class and showing her the steps to operate it, including basic troubleshooting. He might also make a note on his schedule to stop in her classroom periodically during the lesson to check that the projector is operating correctly and that Ms. Mills is successfully projecting the students' maps.

Using atlases: Mr. Yee can show Ms. Mills Internet sites that provide access to different types of maps. Student can work in both print atlases and digital atlases. This supports the lesson in that students will have greater access to both the information they need to make the maps and a greater number of available maps. Ms. Mills could also conduct a class discussion about the differences between using a print atlas and a digital atlas.

Mr. Yee can support Ms. Mills by bookmarking a number of appropriate map websites, placing links on the desktop, or adding the sites to Favorites in advance of the lesson. Ms. Mills can then familiarize herself with the information available on the websites. The sites will also be readily available to students when it's time for them to work.

Rationale for the Score of 3

This response earned a score of 3 because it provides three examples and answers both aspects of the question. The examples relate directly to the objectives of the lesson plan and are appropriate for students in a fifth-grade classroom. The response clearly explains how each technology supports, advances, or enriches the lesson, and provides realistic and valuable suggestions for preparing and supporting the teacher to use the technology effectively.

Sample Response Earning a Score of 2

Mr. Yee can suggest that Ms. Mills have the students use Internet sites that contain different maps instead of using the print atlases. Students will have access to many different types of maps and might enjoy the activity more because they are using computers. Students may even have their own tablets, which they can also use to access maps.

Mr. Yee can support Ms. Mills by either working with her to locate map sites that are appropriate for students or providing her with links to map sites.

Mr. Yee can co-teach a lesson with Ms. Mills on how to use drawing programs to make maps so students can use the computers instead of colored pencils and map templates. Knowing how to use a drawing program is a skill students can apply in many of their classes, and as above, they generally enjoy using this type of program.

Mr. Yee can suggest that Ms. Mills have the students research the different types of maps using the Internet, rather than simply finding the information in their textbooks. This is a more inquiry-based approach to learning.

Mr. Yee can support Ms. Mills by bookmarking sites that contain information on different types of maps so students can locate them easily and begin working on their assignment.

Rationale for the Score of 2

This response earned a score of 2 because, despite providing three examples, one of the examples does not answer the portion of the question about supporting the teacher to use the example successfully. Additionally, the examples do not clearly explain how the use of the technology supports, advances, or enriches the lesson in any meaningful or concrete way, but instead provides generalizations that may or may not be accurate.

Sample Response Earning a Score of 1

There are many ways Ms. Mills can integrate digital technology into her lesson plan. One easy way is to use PowerPoint to teach her lesson. She can integrate graphics and music, and students generally find it easier to take notes from a PowerPoint presentation. Mr. Yee should talk to her about the importance of preparing students for a twenty-first century world and workplace. Perhaps then, Ms. Mills will be more motivated to integrate technology into her lessons.

Another way Ms. Mills can integrate technology is to direct students to Internet sites that provide information on maps. Google Maps would work out well because the students could view the school, their neighborhoods, or other familiar places, and take note of the physical and man-made features. They can also see the difference between printed directions, graphic maps, and the satellite views. This will enrich the lesson for them, since students learn better when they make a personal connection to their learning.

A third way Ms. Mills can integrate technology is to have her students participate in global classroom project, such as OneWorld Classrooms. Students can learn and share information about their own cultures and regions as they explore and learn about other world cultures and regions. Mr. Yee can support Ms. Mills by helping her locate a global classroom website, making sure her participation conforms to the school's acceptable use policy, and getting her and her students set up.

Rationale for the Score of 1

This response earned a score of 1 because, despite providing three examples, only one answers the portion of the question about supporting the teacher to use the technology successfully. Additionally, only the example of using PowerPoint has a general relevance to the objectives of the lesson. As interesting and engaging as satellite maps and classroom exchanges are, they neither support, advance, nor enrich the lesson the teacher is preparing to teach.

Constructed-response Question 2

This constructed-response question is an evaluation of an equity checklist.

General Directions

Plan to use approximately 15 minutes to complete this question.

Read the constructed-response question carefully before you begin to write your response to ensure that you address all components. Think about how you will organize what you plan to write.

The final version of your response should conform to the conventions of standard written English. Your written response should be your original work, written in your own words, and not copied or paraphrased from some other work. You may, however, use citations when appropriate.

Sample Question

Title of software package/program: _____

Criterion

Is the level of the language that the program offers clearly indicated?	Yes/No
Is it easy to start the program?	Yes/No
Is the user interface (e.g., screen layout, navigation icons) easy to understand and use?	Yes/No
Is it always clear to the learner which point he or she has reached in the program?	Yes/No
Does the program include scoring?	Yes/No
If a scoring system is used, does it make sense?	Yes/No
Is the learner offered useful feedback if he or she gets something wrong?	Yes/No
If the program includes pictures, are they (a) relevant, (b) an aid to understanding?	Yes/No
If the program includes sound recordings, are they (a) relevant, (b) an aid to understanding?	Yes/No
Can the learner record his or her own voice and play it back?	Yes/No
If the program includes video sequences, are they of an adequate quality?	Yes/No
If the program includes video sequences, are they (a) relevant, (b) an aid to understanding?	Yes/No
Is the program relevant to your program of study?	Yes/No

An instructional technology coordinator is revising the checklist of criteria used to evaluate both individual and networked software programs for instructional use.

- I. Add TWO statements to the checklist that support equity or equal access.
- II. For EACH, describe the aspect of equity or equal access the statement addresses and explain how meeting the criteria supports equity or equal access.

Student Response Earning a Score of 3

Are people depicted in nonstereotypical roles?

Lots of research shows that software designers assume that the majority of software users will be male. This assumption often results in reinforced male and female stereotypes in computer software. A resource selected for instructional use should avoid associating certain characteristics with girls and certain characteristics with boys. It should show boys and girls doing a variety of household roles, leisure activities, and behaviors, and experiencing a range of emotions, not depicting only girls as nurturing or sympathetic, and only boys as independent or driven. It's especially important that programs depict girls using and enjoying technology in meaningful ways. This is important because it combats existing stereotypes that girls use technology for less serious purposes and less successfully than boys.

Does the program offer supports or options for students with disabilities?

A software program should offer alternate ways for users to navigate and interact with the program. A student with a motor disability who may not be able to manipulate a mouse should have the option to use arrows or keystrokes instead. A student who is hard of hearing should be able to read instructions on the screen; similarly, a student with a visual impairment should have the option to hear instructions. Programs that offer these and similar features increase the ways students can access the program's content and help equalize students' participation in classroom activities.

Rationale for the Score of 3

This response earned a score of 3 because it adds two appropriate criteria to the checklist and clearly explains how each criterion supports either equity or equal access.

Sample Response Earning a Score of 2

Is there a mix of male and female voices and images?

This question is important because students feel more comfortable when they can identify with the sounds and images in a computer program. They should hear both males and females giving instructions or information and, if appropriate, hear and see people who sound and look like themselves and with whom they can make a connection. This is mostly a problem for students from ethnic minorities and students with disabilities, who rarely hear and see students who sound and look like they do.

Can students with disabilities operate the program?

Software can be disability-friendly in a number of ways. One is voice activation, which allows a user to click or touch a visual image and have the program describe what the user is seeing. Voice activation is helpful for people with visual impairments who may have difficulty reading screen instructions. Audio by headphones is another feature that improves access for users who are hard of hearing. This allows a user with this disability to increase the volume as needed, or in some cases, send the audio to only one ear or the other. Any feature that makes the content of the program more accessible for the user promotes equitable access, not just access for the fully abled, and is a desirable feature in a software program.

Rationale for the Score of 2

This response earned a score of 2. It provides two appropriate criteria, but the first makes generalized statements that do not clearly connect the criterion with supporting equal access or equity. The explanation for the second criterion is explained adequately.

Sample Response Earning a Score of 1

Does the program represent many different cultures?

Learning about other cultures helps students understand and feel engaged in the world they live in. They learn to appreciate how other people live by learning about their cultures, religions, and languages. It helps them appreciate the differences and similarities between how they and others live. A software program that exposes students to other cultures builds both equity and equality.

Does the program support English-language learners?

ELLs benefit from programs that have built-in glossaries, thesauruses, and allow them to hear words aloud or play instructions over and over if they want. They are also helped by real-time spellchecking and smart word processors. When ELLs are provided with support that overcomes their language barrier, they experience more equity.

Rationale for the Score of 1

This response earned a score of 1. It identifies two criteria, but the first criterion mistakes multiculturalism for equity and equal access. The second criterion identifies program features that support ELLs, but it does not adequately explain how the features serve to equalize ELLs' access to the information in the software program.

Preparation Resources

The resources listed below may help you prepare for the GACE assessment in this field. These preparation resources have been identified by content experts in the field to provide up-to-date information that relates to the field in general. You may wish to use current issues or editions of these materials to obtain information on specific topics for study and review.

Guide to Taking a GACE Computer-delivered Assessment

This guide explains how to navigate through a GACE assessment and how to answer different types of test questions. This free download is available in the Test Preparation Resources section of the GACE website at www.gace.ets.org/prepare.

Reducing Test Anxiety

This guide provides practical help for people who suffer from test anxiety. Designed specifically for GACE test takers, but useful to anyone who has to take tests, this guide reviews the major causes of test anxiety and offers practical advice for how to counter each one. Download this guide for free from the Test Preparation Resources section of the GACE website at www.gace.ets.org/prepare.

Study Tips: Preparing for a GACE Assessment

This document contains useful information on preparing for selected-response and constructed-response tests. The instruction, tips, and suggestions can help you become a better-prepared test taker. See the Test Preparation Resources section of the GACE website at www.gace.ets.org/prepare for this free download.

Journals

Educational Technology Research and Development, Association for Educational Communications and Technology.

Journal for Computing Teachers, International Society for Technology Education.

Journal of Research on Technology in Education, International Society for Technology Education.

Tech Trends, Association for Educational Communications and Technology.

Other Resources

Baker, F. (2012). *Media Literacy in the K-12 Classroom*. Washington, District of Columbia: International Society for Technology in Education.

Bergmann J., and Sams A. (2012). *Flip Your Classroom: Reach Every Student in Every Class Every Day*. Washington, District of Columbia: International Society for Technology in Education.

Boss, S. (2008). *Reinventing Project-Based Learning with Technology*. Washington, District of Columbia: International Society for Technology in Education.

Greaves, T. et al. (2012). *Revolutionizing Education through Technology*. Washington, District of Columbia: International Society for Technology in Education.

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- Stavreded, T. (2012). *Effective Online Teaching: Foundations and Strategies for Student Success*. New York, N.Y.: John Wiley & Sons, Inc.
- Warlick, D. (2004). *Redefining Literacy for the 21st Century*. Santa Barbara, Calif.: Linworth Publishing.
- Wlodkowski, R., and M. Ginsberg (2010). *Teaching Intensive and Accelerated Courses. Instruction That Motivates Learning*. New York, N.Y.: John Wiley & Sons, Inc.

Online Resources

Association for Educational Communications and Technology — [**www.aect.org**](http://www.aect.org)

ISTE Standards for Administrators — [**www.iste.org/standards/standards-for-administrators**](http://www.iste.org/standards/standards-for-administrators)

ISTE Standards for Coaches — [**www.iste.org/standards/standards-for-coaches**](http://www.iste.org/standards/standards-for-coaches)

ISTE Standards for Students — [**www.iste.org/standards/standards-for-students**](http://www.iste.org/standards/standards-for-students)

ISTE Standards for Teachers — [**www.iste.org/standards/standards-for-teachers**](http://www.iste.org/standards/standards-for-teachers)

International Society for Technology in Education — [**www.iste.org**](http://www.iste.org)

Office of Educational Technology — [**www.ed.gov/edblogs/technology**](http://www.ed.gov/edblogs/technology)