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nets•s Assessment

National Educational Technology Standards for Students

Resources for Student Assessment

iste Publications

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National Educational Technology Standards for Students

Resources for Student Assessment

Essential guidelines for assessing the NETS for Students

The popular wisdom today is that kids are far more comfortable with technology than most of their parents and teachers. Stories of plugged-in kids surfing the Web, text-messaging friends, posting to blogs and playing multiuser games—often at the same time—can make us forget that not all K–12 students enjoy the same access to these technologies and resources. Nor does the fact that many students surf and chat every day necessarily mean they have the technology skills they need to succeed in the 21st century. How can educators go beyond popular images and anecdotes to accurately measure their students' ability to use technology effectively for learning? ISTE's new book on student technology assessment shows you how.

Resources for Student Assessment examines current best practices at the site, district, and state levels, and provides a detailed set of guidelines for creating and choosing valid, reliable tests of technology literacy. In this era of increased accountability and high-stakes testing, this book gives teachers, administrators, and policy makers at every level a host of resources to inform their decision making on NETS assessment.

FEATURES

- NETS•S performance rubrics detailing specific technology achievement targets for grades PK–12
- Comprehensive survey of technology assessment options and concepts
- Models for creating classroom-level tests that combine content-area and technology assessment
- Case studies of large-scale district, state, and national assessment initiatives

A Glance Inside

Resources for Student Assessment offers a wealth of assessment resources, including NETS-based performance rubrics, models for classroom assessment, and case studies of large-scale testing initiatives.

Contents

NETS•S performance rubrics describe in detail what students should know and be able to do at each grade level.

FIGURE 2.5: Rubric for Grades 6–8

ISTE NETS for STUDENTS	PERFORMANCE LEVEL NOVICE By End of Grade 6	BASIC By End of Grade 7	PROFICIENT By End of Grade 8	ADVANCED
1. Basic operations and concepts **a. Students demonstrate a sound understanding of the nature and operation of technology systems. (nature and operations)**	1) Students know how to connect and use a wide variety of input and output devices and common peripherals (e.g., scanners, digital probes, digital cameras, and video projectors); and how to access networked resources. 2) Students know how to explore, identify, and develop presentations describing types of occupations/careers that rely on computer-based technology. 3) Students know how to insert photos, graphics, graphs, spreadsheets, sound, and video into	1) Students discuss common hardware and software problems and identify strategies for troubleshooting and solving minor hardware and software problems. 2) Students know how to apply Search Engines, word processors, data bases, spreadsheets, timelines, charts/ graphs, survey, communications nology-based re and communicat organize, synthe and communicat data collected re	1) Students recognize hardware and software components used to provide access to network resources and know how common peripherals (i.e., scanners, digital cameras, and video projectors are accessed, controlled, connected, and used effectively and efficiently. 2) Students know how to evalu-	1) Students describe strategies for identifying, solving, and preventing routine hardware and software problems that occur during everyday technology use. 2) Students know how to research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources

PERFORMANCE-BASED TEST ITEMS

A performance-based test item asks a test taker to perform a specified task and measures how successfully and accurately that task is performed. Some examples of performance-based testing in technology include:

- An interactive simulation of a product (such as a word-processing program) that asks a test taker to perform a specific task (e.g. setting margins) and automatically determines whether the specified task has been performed successfully.
- A concurrent testing product that places a test taker into a real application (such as a spreadsheet program) and asks the candidate to perform a specific task (e.g. changing column width). The testing product has "hooks" into the live application to determine if the test taker has accomplished the specified task successfully.
- A mechanical assessment in which a test taker is asked to create a work product (such as a slide show created with presentation software) in which the end product (the presentation file) is reviewed by a trained grader to determine if the tasks assigned have been accomplished as specified.
- An observational assessment in which a test taker is observed and scored while using a tool (such as a computer running a specific operating system) to complete a list of assigned tasks.

Generally speaking, performance-based test items are best used to measure skills, while linear test items can be more useful when testing concepts, knowledge, or attitudes. The following example illustrates the differential effectiveness of these two assessment item types:

FIGURE 7.6

LINEAR TEST ITEM	PERFORMANCE-BASED TEST ITEM
Which of the following commands will allow you to change margins? A. From the File menu, select Margins. B. From the File menu, select Page Setup C. From the Format menu, select Margins. D. From the Format menu, select Paragraph.	
This linear test item is testing just one component of the objective: which menu choice contains an option to change margins. The question is not put into the context of the software program, and does not ask the student to perform a complete software task. In this case, the student could memorize the answer and still not be able to perform the task. These items are readily constructed by teachers.	This performance-based testing item, in contrast, places the student in a simulation of the software environment and requires that the task be performed from start to finish in any correct way the software allows. Only a fully interactive performance-based item allows assessment of all components of the objective. Constructing this type of item requires extensive support. Exams including simulation items are commercially available.

ASSESSMENT RESULTS

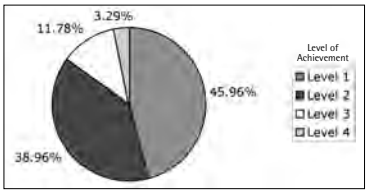
Figure 4.3 illustrates the item hierarchy for the questions that survived both construct validation by the Rasch item analysis and content validation by the ISTE NETS expert panel. The left side of the figure depicts the overall technology literacy of students (based on the distribution of scores of all students taking the test), while the right side depicts the difficulty of the questions. Figure 4.3 also shows the mean ability level of students on the left and the mean difficulty level of questions on the right, and indicates that the mean ability level of students was below the mean difficulty level of the questions.

FIGURE 4.3

Although the questions were somewhat more difficult overall than the ability level of the students who participated in the field test, the overlap between the distribution of students and questions shown in Figure 4.3 is generally very good for a standards-based assessment. The item reliability for the assessment was 0.98, indicating that items were very well distributed across the four achievement levels. The person reliability for the assessment was 0.79, indicating that students were reasonably well spread out on the technology achievement continuum. Future test development will be focused on generating more questions at the lower end of the difficulty scale and closing gaps in the item hierarchy (a gap is a space in the hierarchy where no question matches the exact ability level of one or more students).

The cut scores established by the expert panel categorize students into four levels of achievement in relation to the NETS•S. Figure 4.3 shows that an overwhelming majority of students scored in the novice (n=558) or basic (n=473) range on the field test. Only 40 of 1,217 students achieved at the advanced level, while 143 scored in the proficient range. Figure 4.4 illustrates the achievement levels of all 1,217 students who participated in the field test:

FIGURE 4.4:
NETS Achievement of Students



These empirical data provide evidence to support the assumption

Descriptions and comparisons of question types and testing options help educators at every level choose the most appropriate assessment for their needs and setting.

Case studies of current district and state initiatives provide insights and guidelines for building valid, scalable technology assessments for larger populations.

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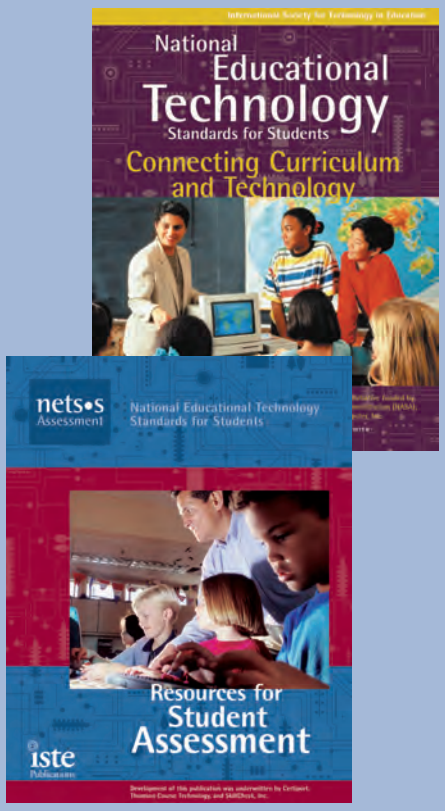
NETS for Students



NETS for Teachers

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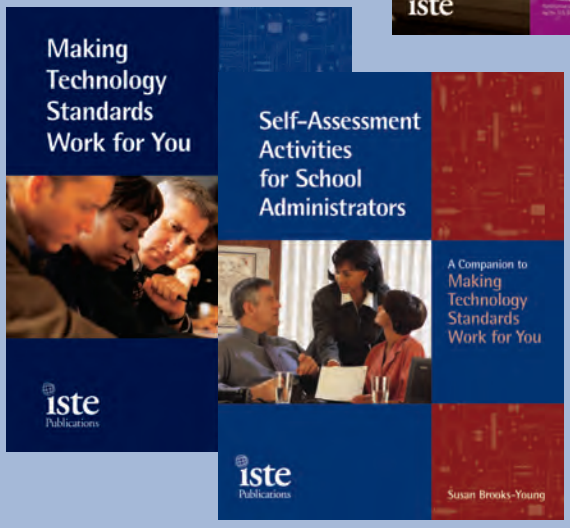

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