

# Setting Standards on the Core and Advanced iSkills™ Assessments

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February 2008

ETS RM-08-04



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## **Abstract**

This report documents a standard-setting study to determine recommended minimum scores (cut scores) needed on the Core and Advanced iSkills™ assessments for examinees to be considered at a foundational level of ICT literacy skill. Two foundational levels—one for each iSkills assessment—had been specified previously by the National ICT Literacy Policy Council, a group that was formed by the National Forum on Information Literacy (<http://www.infolit.org>) and that serves as the certification board for ICT literacy standards. Following a modified, extended Angoff method and a counterbalanced design, two independent panels converged on recommended scores corresponding to the foundational levels: 165 (on a scale of 0–300) for the Core iSkills assessment and 575 (on a scale of 400–700) for the Advanced iSkills assessment.

Key words: Standard setting, Angoff, ICT literacy, iSkills assessment

## **Acknowledgments**

First and foremost, we thank the standard-setting panel, 18 educational experts who worked diligently and with good humor throughout the 4-day standard-setting study. We thank our ETS colleagues Margaret Redman, Patricia Baron, and Craig Stief for their valued contributions during the standard-setting study and Michael Zieky and Mary Pitoniak for their constructive reviews of a previous edition of this report. We also extend our appreciation to the National ICT Literacy Policy Council, chaired by Lana Jackman, for its work on the foundational level descriptions, selection of standard-setting panelists, and overall guidance. Finally, this study would not have been possible without the support of and funding provided by the ETS Higher Education division.

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## Executive Summary

This report documents a standard-setting study held July 20–23, 2007, at Educational Testing Service (ETS) in Princeton, New Jersey. The purpose of the study was to determine recommended minimum scores needed on the Core and Advanced iSkills™ assessments for examinees to be considered at a foundational level of information and communication technology (ICT) literacy skill.

Two foundational levels—one each for the Core iSkills assessment and Advanced iSkills assessment—had been specified previously by the National ICT Literacy Policy Council, a group that was formed by the National Forum on Information Literacy (<http://www.infolit.org>) and that serves as the certification board for ICT literacy standards. The core foundational level describes the minimum ICT literacy skills a student should have upon entering the first year of post-secondary education. The intermediate foundational level describes the minimum ICT literacy skills a student should have upon entering upper-division post-secondary coursework or entering the workforce. The label *intermediate* was used for the Advanced iSkills assessment because the council believed that the label was a more appropriate description of a foundational level of skill. The two foundational level descriptions were reviewed by a larger community of educators and workforce representatives and suggested revisions were accepted by the council. The council-approved foundational level descriptions were key components of the standard-setting process and are shown in Appendix F.

### *iSkills Assessments*

In designing ETS's iSkills assessment, librarians and information literacy experts collaborated to produce a measure of ICT literacy: the information literacy skills that arise in technical environments. Both the Core and Advanced iSkills assessments consist of approximately 60 items derived from performance on 15 interactive, performance-based tasks. The scoring of the items follow rubrics that specify the nature of responses needed to gain full credit (1), partial credit (0.5), or no credit (0). The overall raw score on the assessment is the sum of all item scores.

### ***Standard-Setting Process***

Eighteen educators, each with direct experience with the information literacy of high school or college students, were divided into two subpanels. These subpanels independently made standard-setting judgments for each item in both tests; the order in which the subpanels considered each assessment was counterbalanced. On the final day of the study, the panel reconvened to reconcile any differences in their respective recommended cut-score judgments.

The standard-setting study followed a modified, extended Angoff procedure. Each panelist first independently judged the average score that would be received on each of the 60 items by 100 just qualified candidates (JQCs; examinees just meeting the requirements of the foundation level corresponding to the assessment being considered). Members of each subpanel discussed their Round 1 judgments, and this process continued for a second round of judgments and discussion, followed by a third round of judgments. Item-level data were introduced during the Round 1 discussion and classification outcomes (percentage of examinees meeting or exceeding the preliminary cut scores) were presented during the Round 2 discussion. The cut scores derived from the Round 3 judgments were reconciled in full panel discussions.

### ***Recommended Cut Scores Corresponding to Foundational Levels***

The reporting scale for the Core iSkills assessment ranges from 0 to 300, calibrated to a mean of 150 and standard deviation of 35. The panel recommended a cut score of **165**. Considering the first year students who have taken the Core iSkills assessment since 2006, this cut score results in approximately 24% of community/technical college first-year students and 39% of 4-year college freshmen meeting or exceeding the core foundational level of ICT literacy skill. The reporting scale for the Advanced iSkills assessment ranges from 400 to 700, calibrated to a mean of 550 and standard deviation of 35. The panel recommended a cut score of **575**. Considering the juniors and seniors who have taken the Advanced iSkills assessment since 2006, this cut score results in approximately 27% of these students meeting or exceeding the intermediate foundational level of ICT literacy skill.

In December 2007, the National ICT Literacy Policy Council approved the recommended cut scores.

## Introduction

This report documents a standard-setting study held July 20-23, 2007, at ETS in Princeton, New Jersey. The purpose of the study was to determine recommended minimum scores needed on the Core and Advanced iSkills™ assessments for examinees to be considered at a foundational level of information and communication technology (ICT) literacy skill. The recommended minimum scores (cut scores) will be presented to the National ICT Literacy Policy Council—a group that was formed by the National Forum on Information Literacy (<http://www.infolit.org>) and that serves as the certification board for ICT literacy standards—for acceptance or adjustment before public release of the cut scores.

The next sections describe the foundational levels, iSkills assessments, and standard-setting process (overall design, panelist descriptions, and judgment process) in more detail. Following those sections are the results, including initial evaluations by the panelists, cut-score recommendations, and final evaluation of the standard-setting process.

## Foundational Levels

The National ICT Literacy Policy Council (<http://www.infolit.org/policycouncil.doc>) met on February 5 and 6, 2007, in Washington, DC to draft definitions for expected levels of ICT literacy skill performance. These definitions, presented in Appendix F, represent the *foundational* level of ICT literacy skills—what is minimally expected of students leaving either secondary education to enter college (core foundational level) or their second year of postsecondary education to enter upper-division coursework or the workforce (intermediate foundational level). The foundational levels, therefore, describe standards of performance expected of students at two transition points in their education. These definitions were subsequently reviewed by other representatives (i.e., external to the policy council) of the high school, community college, 4-year college/university, and workforce communities before being finalized and accepted by the policy council.

In defining these foundational levels, council members considered ICT literacy-related standards—such as the *Information Literacy Competency Standards for Higher Education* (Association of Colleges and Research Libraries, 2000)—as well as the ICT Literacy higher education framework (<http://www.ets.org/iskills>), which forms the basis for the ETS iSkills assessments. Each foundational level description is intended to help define a minimal cut score on either the Core or Advanced iSkills assessment. Each level definition includes a general

summary description and then specific indicators addressing the seven content areas comprising the ETS ICT literacy framework that underlies the iSkills assessments: define, access, evaluate, manage, integrate, create, and communicate (see Table 1 for definitions of these areas). The policy council reviewed each definition to assure that the general description and specific indicators were aligned (mutually reinforcing) and that there was a clear and appropriate progression of skills from the core foundational level to the intermediate foundational level.

### **iSkills Assessments**

The Core iSkills assessment measures the ICT literacy skills of students who are making the transition from high school to the first year of post-secondary education; these are students entering either community college or a 4-year college program. The assessment consists of 63 items within 15 performance-based tasks. Each item is scored 0, 0.5, or 1, and collectively the tasks address the seven content areas of the ICT literacy framework (Table 1). The reporting scale ranges from 0 to 300, with the mean set to 150 and the standard deviation set to 35, based on a calibration group of test takers who took the assessment in early 2006.

The Advanced iSkills assessment measures the ICT literacy skills of students who are making the transition either from second-year post-secondary education to third-year or the workforce. The assessment consists of 58 items within 15 tasks. Each item is scored 0, 0.5, or 1, and collectively the tasks address the same seven ICT literacy content areas as the Core iSkills assessment. The reporting scale ranges from 400 to 700, with the mean set to 550 and the standard deviation set to 35, based on a calibration group of test takers who took the assessment in early 2006.

Further details on these assessments and their development are provided on the iSkills Web site (<http://www.ets.org/iskills>) and in Katz (2007).

### **Panel Members**

Panelists were 18 educators (secondary and post-secondary levels) who, collectively, are familiar with the ICT literacy skills of students at various levels, including high school seniors, students entering college, college students moving to upper-level coursework, and community college students leaving higher education to enter the workforce. These levels represent the target populations for the Core and Advanced iSkills assessments. Panelists were drawn from recommendations made by members of the National ICT Literacy Policy Council, the National

**Table 1**

***ETS ICT Literacy Framework***

<p><b>Define:</b> Understand and articulate the scope of an information problem in order to facilitate the electronic search for information, such as by</p> <ul style="list-style-type: none"><li>• Distinguishing a clear, concise, and topical research question from poorly framed questions, such as ones that are overly broad or do not otherwise fulfill the information need</li><li>• Asking questions of a “professor” that help disambiguate a vague research assignment</li><li>• Conducting effective preliminary information searches to help frame a research statement</li></ul>
<p><b>Access:</b> Collect and/or retrieve information in digital environments. Information sources might be Web pages, databases, discussion groups, e-mail, or online descriptions of print media. Tasks include</p> <ul style="list-style-type: none"><li>• Generating and combining search terms (key words) to satisfy the requirements of a particular research task</li><li>• Efficiently browsing one or more resources to locate pertinent information</li><li>• Deciding what types of resources might yield the most useful information for a particular need</li></ul>
<p><b>Evaluate:</b> Judge whether information satisfies an information problem by determining authority, bias, timeliness, relevance, and other aspects of materials. Tasks include</p> <ul style="list-style-type: none"><li>• Judging the relative usefulness of provided Web pages and online journal articles</li><li>• Evaluating whether a database contains appropriately current and pertinent information</li><li>• Deciding the extent to which a collection of resources sufficiently covers a research area</li></ul>
<p><b>Manage:</b> Organize information to help you or others find it later, such as by</p> <ul style="list-style-type: none"><li>• Categorizing e-mails into appropriate folders based on a critical view of the e-mails’ contents</li><li>• Arranging personnel information into an organizational chart</li><li>• Sorting files, e-mails, or database returns to clarify clusters of related information</li></ul>
<p><b>Integrate:</b> Interpret and represent information, such as by using digital tools to synthesize, summarize, compare, and contrast information from multiple sources while</p> <ul style="list-style-type: none"><li>• Comparing advertisements, e-mails, or Web sites from competing vendors by summarizing information into a table</li><li>• Summarizing and synthesizing information from a variety of types of sources according to specific criteria in order to compare information and make a decision</li><li>• Re-representing results from an academic or sports tournament into a spreadsheet to clarify standings and decide the need for playoffs</li></ul>
<p><b>Create:</b> Adapt, apply, design, or construct information in digital environments, such as by</p> <ul style="list-style-type: none"><li>• Editing and formatting a document according to a set of editorial specifications</li><li>• Creating a presentation slide to support a position on a controversial topic</li><li>• Creating a data display to clarify the relationship between academic and economic variables</li></ul>
<p><b>Communicate:</b> Disseminate information tailored to a particular audience in an effective digital format, such as by</p> <ul style="list-style-type: none"><li>• Formatting a document to make it more useful to a particular group</li><li>• Transforming an e-mail into a succinct presentation to meet an audience’s needs</li><li>• Selecting and organizing slides for distinct presentations to different audiences.</li><li>• Designing a flyer to advertise to a distinct group of users</li></ul>

*Note.* From “Testing Information Literacy in Digital Environments: The ETS iSkills™ Assessment” by I. R. Katz, 2007, *Information Technology and Libraries*, 26(3), pp. 3-12. Copyright 2007 by Educational Testing Service (ETS). Used with permission of the ETS and the author.

Forum for Information Literacy, and the American Association of School Librarians. Panelists were selected to represent experience with diverse populations of students defined by race/ethnicity, geographic location, and institution type (high school, community or technical college, 4-year college or university).

For the current study, the panelists were divided into two subpanels of nine members each using a stratified random sampling approach. Each subpanel had comparable representation from the three institution types as well as reflecting similar geographic and ethnic diversity.

Table 2 shows characteristics of the panelists in each of the two subpanels. One subpanel (Panel A) worked on the Core iSkills assessment first, followed by the Advanced iSkills assessment. The other subpanel (Panel B) worked on the Advanced iSkills assessment first followed by the Core iSkills assessment. On the final day of the study, the two groups reconciled any differences in the cut score determinations for both tests. This counterbalanced design was used to mitigate the influence of the order in which the assessments are considered by the panelists.

**Table 2**  
*Characteristics of Panelists*

	Panel A (Core – Advanced iSkills assessments) <i>n</i> = 9	Panel B (Advanced – Core iSkills assessments) <i>n</i> = 9
Gender		
Female	5	5
Male	4	4
Race/ethnicity		
Asian American	1	
African American	2	5
Hispanic	1	
White (non-Hispanic)	5	4
Institution type		
High school	2	3
Community/technical college	3	3
College or university	4	3
Institution location		
Northeast	2	2
Midwest	2	2
South	2	1
Southwest	2	1
West	1	3

## **Process and Method**

### ***Prior to the Meeting***

To familiarize themselves with the iSkills assessments before the standard-setting meeting, all panelists completed both levels of the iSkills assessment. Panelists administered the tests to themselves, on their own computers, and experienced all steps of the test including background questions, the brief tutorial, and all tasks. Due to logistical constraints, panelists were not sent score reports and so received no feedback on their performance.

In addition to completing the assessments, panelists reviewed the foundational level descriptions prior to the meeting. They were asked to compose two to three performance indicators—brief descriptions of observable student behaviors and outcomes—for each of the seven content areas of the foundational levels. The indicators were intended to clarify the meaning of each content area for the panelists.

Panelists were sent these assignments in an e-mail approximately 2 weeks before the standard-setting study (Appendix B). All panelists acknowledged receiving the e-mail assignments.

### ***During the Meeting***

The agenda for the standard-setting study is included in Appendix C. The standard-setting study began with a general introduction to the session. Dr. Irvin Katz, senior research scientist for the iSkills program at Educational Testing Service (ETS), welcomed the panelists and introduced the ETS team responsible for the design and facilitation of the standard-setting process. Dr. Richard Tannenbaum from ETS's Validity Research Center provided overviews of standard setting and the procedures to be followed by the panelists. Dr. Katz then led a discussion of the iSkills assessments, informed by the panelists' experience with having completed the assessments on their own before the standard-setting meeting. This discussion was meant to reinforce the panelists' familiarity with both assessments' content as well as the purpose and population associated with each assessment. Panelists were encouraged to discuss, for example, what the test was covering (the major content areas), whether they thought any tasks would be particularly challenging for students, and whether there were any tasks that they thought addressed knowledge or skills that were particularly important for students to know or have. The panelists also had the opportunity to raise and discuss concerns about the tasks, although it was made clear that the primary purpose of

this test familiarization activity was not to conduct a review, per se. To maintain focus on the standard-setting process, but not to discount the panelists' reactions to tasks, they were encouraged to write down specific concerns, which would be shared after the meeting with the ETS Assessment Development group.

Panelists then reviewed both foundational level descriptions as developed by the policy council, using the descriptions to define the just qualified candidate (JQC). The JQC represents those students who have just enough ICT literacy skills to meet the challenges of entry-level college work (core) or upper-division college work and/or entry into the workplace (intermediate). The JQC is not the most able student, nor even the average performing student, but the student with just enough knowledge and skills to be considered meeting either the core foundational ICT literacy level (Core iSkills) or intermediate foundational ICT literacy level (Advanced iSkills). JQCs serve as the frame of reference against which the panelists judge the difficulty of each test item as part of the standard-setting process.

For this review, the panel was divided into two groups that initially worked in separate rooms, with approximately equal numbers of panelists from Panels A and B working in each room. One room reviewed the core foundational level and the other reviewed the intermediate foundational level (applicable to the Advanced iSkills assessment). The current definitions describe what is expected of a student who just meets the core and intermediate foundational levels. When they originally defined the foundational levels, the policy council members were asked to focus on the JQC from the outset, rather than trying to define the full range of ICT literacy skills for each level. The discussions of the standard-setting panelists focused on their understanding of these descriptions and their fleshing out of the descriptions. Care was taken so that in refining terms, panelists did not alter the policy council's definitions of the levels. The goal was to generate several knowledge and skill statements (performance indicators) that would adequately describe the JQC so that the panelists would have a clear picture of whom they considered to be just qualified. The intention was not to produce an exhaustive description. Drawing upon their own professional experience and their experience with having taken the assessments, each group produced three to five additional bullet points for each content area of the foundational levels that described the types of student behaviors or products that characterize students just meeting the foundational level. Because the descriptions were for the panel's own use, panelists were permitted to use short-hand notation and brief bullets, if desired, rather than

extended prose. The focus was on ensuring that the descriptions were sufficient for the panelists to have a common understanding of the knowledge and skills expected of JQCs.

After working separately, the full panel reconvened and each group presented its explication of the foundational level descriptions. Some modifications and clarifications to these bullet points were made during the full group discussion; the final expanded foundational level descriptions (core and intermediate) were handed out to the entire group for their reference during the standard-setting process.

Next, Dr. Tannenbaum gave an introduction to standard setting and explained the standard-setting process and the specific steps the panelists would follow to make their standard-setting judgments. An example of how a cut score is computed was also provided. The panelists then had an opportunity to practice making their standard-setting judgments. Panelists were trained to complete a modified, extended Angoff approach (Hambleton & Plake, 1995). In brief, panelists were asked to consider the knowledge and skills being measured by an item and then to consider the average score that 100 JQCs—as articulated by the full panel—would be expected to receive on an item. As noted earlier, most items on the iSkills assessment are scored as correct (1), partially correct (0.5), or incorrect (0). (A small number of items are scored 1 or 0.) Panelists were to record their judgments (average scores) on scannable forms using the following scale: 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1. The easier an item is believed to be for JQCs, the higher the average score rating (a score closer to 1, or full credit); the more difficult the item is believed to be for JQCs, the lower the average score rating (a score closer to 0, or no credit). Panelists were encouraged to consider the following rule of thumb: Relatively easy items were in the 0.7 to 1 range; relatively difficult items were in the 0 to 0.3 range; and moderately easy/moderately difficult items were in the 0.4 to 0.6 range. Panelists also were reminded that any one test taker either scores 0, 0.5, or 1 on an item (0 or 1 on some items), but that they were to consider how, on average, 100 test takers would perform.

The panelists then were given an opportunity to practice making their standard-setting judgments on one task that contained two items. The judgments were collected, summarized using an ETS-developed analysis program, and discussed. The feedback included the number of points each panelist believed a JQC would earn, the panel's mean judgments and the standard deviation of judgments across panelists. The judgments were also summarized in terms of difficulty ranges as defined above (easy: 0 to 0.3, moderate: 0.4 to 0.6, difficult: 0.7 to 1). This

clustering was a useful way of showing the similarity of the judgments in relation to the overall judged difficulty of each item; that is, whether the majority of panelists (e.g., 67% or more) saw the same item as being in the same range of difficulty or if the panelists' judgments were more spread out across the three ranges of difficulty. The overall cut score for the practice task was computed as it would be for the operational iSkills assessment—the sum of the points for each item. Each panelist's overall cut score was displayed, as was the panel's mean and standard deviation. The panelists were asked to share their judgment rationales so that others could understand their perspectives. The discussion focused on the connection between the knowledge and skills measured by an item and the knowledge and skills of JQCs.

After practice, panelists completed an initial evaluation form (see Appendix G). The form asked the panelists to indicate the extent to which they understood the purpose of the standard-setting study, the extent to which explanations were clear, and whether or not they were ready to proceed with their actual standard-setting judgments.

Once Dr. Tannenbaum verified that all panelists were ready to proceed, the standard-setting process began. From this point forward, the two subpanels (Panel A and B) worked completely independently from one another until they met together on the last day. Dr. Tannenbaum facilitated Panel A, which worked on first the Core iSkills assessment and then the Advanced iSkills assessment; Dr. Katz facilitated Panel B, which worked on first the Advanced iSkills assessment and then the Core iSkills assessment. Each subpanel went through three rounds of judgments, with feedback and discussion between each round. The following procedure was identical for Panels A and B.

*Round 1.* Judgments were made on each item within a task (each task includes two to seven items) before moving to the next task. For each task, the ETS facilitator first provided an overview of the task and its scoring, including screen snapshots of full-credit responses and descriptions of the scoring rubrics. Each panelist then made the following judgment for each item within the task: Of 100 students that just meet the foundational level description, what would be the average score they would most likely earn? Panelists were asked to choose scores between 0 and 1, in increments of 10ths; for example, 0.00, 0.10, 0.20 . . . 1.00. (Although a group of test takers, on average, may earn any score between 0 and 1, for the current purpose of recommending a single cut score for each assessment, 10th-point increments permit sufficient judgment variability, and choosing from a given set of scores reduces the cognitive load on the

panelists.) Panelists were reminded to consider the three difficulty ranges discussed during their training. Panelists worked independently in making these judgments, filling out a scannable score sheet. After panelists completed their judgments for all items within a task, the next task was introduced. After the first few tasks were completed, the standard-setting facilitator confirmed that the panelists understood the process and had no additional questions. The panelists then continued, completing their judgments for the remaining tasks (items within tasks). All score sheets were scanned and the data uploaded into a spreadsheet.

*Round 1 discussion.* The spreadsheet served as the focal point for the discussions. The spreadsheet summarized the cut scores constructed from each panelist's judgments as well as the panel's mean and standard deviation of judgments. In addition, the spreadsheet highlighted any items for which there were relatively large discrepancies among panelists' judgments. Highlighted items included those for which fewer than six of the nine panelists placed the item in the same difficulty range (0 to .3, .4 to .6, and .7 to 1). Primary discussion focused on the items for which there was not a majority consensus, but the members were encouraged to seek clarification on items for which there was consensus, if doing so would be helpful to them. All discussion centered on the connection between the knowledge and skills measured by the item and the knowledge and skills of JQCs. The goal of the discussion was to share the different perspectives of the members, not to argue for a single perspective.

Discussions during Round 1 also included inspection of item difficulty data. The facilitators encouraged panelists not to view the difficulty data as the correct answer, but rather as a general indication of the difficulty of an item for the students taking the test. When judging the Core iSkills assessment, item difficulty data were provided from two groups: (a) first year students at a community college or high school seniors planning to attend a community college ( $N = 340$ ) and (b) first year students at a 4-year college or high school seniors planning to attend a 4-year college ( $N = 2,302$ ). These two groups were included because they perform somewhat differently on the Core iSkills assessment. Students entering or planning to enter a 4-year program tend to score higher on average than students entering or planning to enter a 2-year program (average scores of 157 and 141, respectively). The full group of students who took the Core iSkills assessment included students at different class levels. However, the core foundational level was designed to be descriptive of expectations for students just entering college. Thus, these two groups represent a meaningful subset of the data for consideration by

the standard-setting panel. When judging the Advanced iSkills assessment, item difficulty data were provided from the students targeted in the intermediate foundational level: juniors and seniors attending 4-year colleges ( $N = 2,068$ ).

*Round 2 judgments, Round 2 discussions, and Round 3 judgments.* The procedure for Round 1 was followed for the next round. During the judgments for Round 2, panelists indicated only changes to their previous item-level judgments. If a panelist heard something during the Round 1 discussion that changed his or her interpretation of item difficulty for JQCs, he or she was able to change his or her judgments in the second round. However, panelists were informed that they were not obligated or expected to change their Round 1 judgments.

Following these judgments, panelists discussed the updated results, which included the same information provided for the Round 1 discussions. In addition, panelists were presented with the percentage of test takers meeting or exceeding the Round 2 computed cut score. For the Core iSkills assessment, this classification information was presented for the two applicable groups of test takers: (a) first year students at a community college or high school seniors planning to attend a community college and (b) first year students at a 4-year college or high school seniors planning to attend a 4-year college. For the Advanced iSkills assessment, this classification information was presented for upper-division (third and fourth year) students. Panelists then had an opportunity to change their judgments in a third round. At the completion of Round 3, each subpanel had its preliminary cut score for the assessment under consideration (Core for Panel A and Advanced for Panel B). Each subpanel then repeated the three-round standard-setting process for the other iSkills assessment (Advanced for Panel A and Core for Panel B).

*Full panel discussion.* Panels A and B met to reconcile any differences between their respective cut scores for the Core and Advanced iSkills assessments. At the beginning of this round, panelists were shown the implications of their cut-score decisions based on assessment data: the percentage of students in the three comparison groups (two for Core and one for Advanced) that met or exceeded the selected cut scores. These classification outcomes were presented for each subpanel's independent cut scores and for the average of the two subpanels. The combined panel considered these outcomes to inform their final recommendations of cut scores.

The panelists then completed an evaluation form that asked for their overall reactions to the study, the factors that most influenced their judgments, and their comfort with the recommended cut scores (see Appendix H).

## Results

### *Initial Evaluations*

The panelists completed an initial evaluation form after practicing their standard-setting judgments. The evaluation form asked them to indicate the extent to which they understood the purpose of the standard-setting study, the extent to which explanations were clear, and whether or not they were ready to proceed with their actual standard-setting judgments. Table 3 presents the results of the initial evaluation.

All 18 panelists responded to each evaluation question. All panelists either agreed or strongly agreed that they understood the purpose of the study, that things were explained clearly, that the training they received adequately prepared them, and that they were ready to proceed.

**Table 3**

### *Initial Evaluations*

	Strongly agree	Agree	Disagree	Strongly disagree	No response
I understand the purpose of the study	16	2	0	0	0
The facilitators explained things clearly during the large-group session	16	2	0	0	0
I understand the definitions of the foundational levels	12	6	0	0	0
The training in the standard-setting process adequately prepared me to make my standard-setting judgments	11	7	0	0	0
The explanation of how the recommended cut scores are computed was clear	14	4	0	0	0
The opportunity to practice helped clarify the standard-setting task for me	13	5	0	0	0
I understand how to make the standard-setting judgments	15	3	0	0	0
I am ready to proceed	Yes		No		
	18		0		

### *Summary of Standard-Setting Judgments by Round*

Tables 4 through 7 present a summary of each round of standard-setting judgments for each subpanel’s judgments of each assessment. The numbers in each table reflect the recommended cut score—the number of raw points needed to meet or exceed a foundational level—of each panelist for each of the three rounds. Each subpanel’s (Panel A and Panel B) recommended cut score is reported, as are the standard deviation (SD) of panelists’ cut scores and the standard error of judgment (SEJ).<sup>1</sup> The SEJ is one way of estimating the reliability of the judgments. It indicates how close the mean cut score would likely be to the current mean cut score for other panels of educators similar in composition and experience to the current panel and similarly trained in the same standard-setting methods. A comparable panel’s cut score would be within 1 SEJ of the current mean cut score 68% of the time and within 2 SEJs 96% of the time.

**Table 4**

*Panel A: Core Foundational Level Cut Scores by Round*

Core	Round 1	Round 2	Round 3
Panelist 01	42.4	44.4	44.2
Panelist 02	35.8	36.3	36.2
Panelist 03	37.7	37.9	37.9
Panelist 04	36.0	36.3	36.3
Panelist 05	47.9	46.0	44.7
Panelist 06	35.5	38.2	37.9
Panelist 07	27.4	28.4	28.4
Panelist 08	49.5	49.5	38.2
Panelist 09	48.5	48.3	48.3
Mean cut	40.1	40.6	39.1
SD	7.5	6.9	5.9
SEJ	2.5	2.3	2.0

*Note.* The SD indicates the amount of variability among the panelists’ cut score recommendations. The smaller the SD, the greater the consistency in the individual recommendations. SD = standard deviation, SEJ = standard error of judgment.

**Table 5*****Panel B: Core Foundational Level Cut Scores by Round***

Core	Round 1	Round 2	Round 3
Panelist 10	47.2	47.2	47.2
Panelist 11	42.9	43.2	43.4
Panelist 12	52.1	51.8	51.8
Panelist 13	45.0	45.5	45.5
Panelist 14	43.8	44.4	44.1
Panelist 15	44.1	44.6	44.6
Panelist 16	43.1	43.1	43.1
Panelist 17	37.2	36.7	36.8
Panelist 18	42.5	43.0	43.0
Mean cut	44.2	44.4	44.4
SD	4.0	4.0	4.0
SEJ	0.75	0.75	0.75

*Note.* SD = standard deviation, SEJ = standard error of judgment.

**Table 6*****Panel A: Intermediate Foundational Level Cut Scores by Round***

Intermediate	Round 1	Round 2	Round 3
Panelist 01	39.9	39.6	39.4
Panelist 02	38.5	35.1	35.1
Panelist 03	33.6	33.6	33.6
Panelist 04	41.3	41.5	41.7
Panelist 05	45.3	41.5	40.4
Panelist 06	35.2	34.7	34.0
Panelist 07	35.1	35.7	35.7
Panelist 08	43.0	42.9	39.8
Panelist 09	50.2	49.5	49.5
Mean cut	40.2	39.3	38.8
SD	5.4	5.1	5.0
SEJ	1.8	1.7	1.7

*Note.* SD = standard deviation, SEJ = standard error of judgment.

**Table 7*****Panel B: Intermediate Foundational Level Cut Scores by Round***

Intermediate	Round 1	Round 2	Round 3
Panelist 10	38.3	38.7	38.7
Panelist 11	25.7	35.5	36.0
Panelist 12	42.0	42.3	42.3
Panelist 13	32.3	37.3	37.3
Panelist 14	33.1	37.4	37.8
Panelist 15	38.9	39.9	40.3
Panelist 16	42.1	41.9	41.9
Panelist 17	29.8	35.9	36.3
Panelist 18	39.6	40.1	40.3
Mean cut	35.8	38.8	39.0
SD	5.8	2.5	2.3
SEJ	1.9	0.83	0.77

*Note.* SD = standard deviation, SEJ = standard error of judgment.

In most standard-setting studies, Round 1 judgments are made without discussion among the panelists. The most variability in judgments, therefore, is typically present in the first round. Round 2 and Round 3 judgments, however, are informed by committee discussion; because of this, it is common to see a decrease both in the SD and SEJs. This decrease was observed in most cases for both panels on each of the two assessments.

The mean of the Round 3 judgments represents each subpanel's final recommended cut score for each assessment.

***Recommended Cut Scores by Assessment***

Each cut score accepted by the full panel (Panels A and B combined) was the mean of the cut scores of the two subpanels. The full panel recommended that the core foundational level of ICT literacy skill correspond to a score of **165** (41.8 raw score) on the Core iSkills assessment. Considering the first year students who have taken the Core iSkills assessment since 2006, this cut score results in approximately 24% of community/technical college first year students (and appropriate high school seniors) and 39% of 4-year college

freshmen (and appropriate high school seniors) meeting or exceeding the core foundational level of ICT literacy skill. The full panel recommended that the intermediate foundational level of ICT literacy skill corresponds to a score of **575** (39.0 raw score) on the Advanced iSkills assessment. Considering the juniors and seniors who have taken the Advanced iSkills assessment since 2006, this cut score results in approximately 27% of these students meeting or exceeding the intermediate foundational level of ICT literacy skill.

Table 8 shows additional data on the cut-score recommendations, including the Round 3 cut-score recommendation from each separate panel, the combined-panel mean cut score, and the range of cut scores that fall within 2 SEJs of the mean cut score. ETS suggested that the policy council stay within this range when selecting a final cut score for each assessment to maintain some alignment with the panel’s recommendations. In addition to these data, Table 8 shows the scale score corresponding to the cut scores as well as the percentage of students who would be classified as meeting or exceeding the cut score. Higher cut scores result in fewer students being classified as meeting a foundational level.

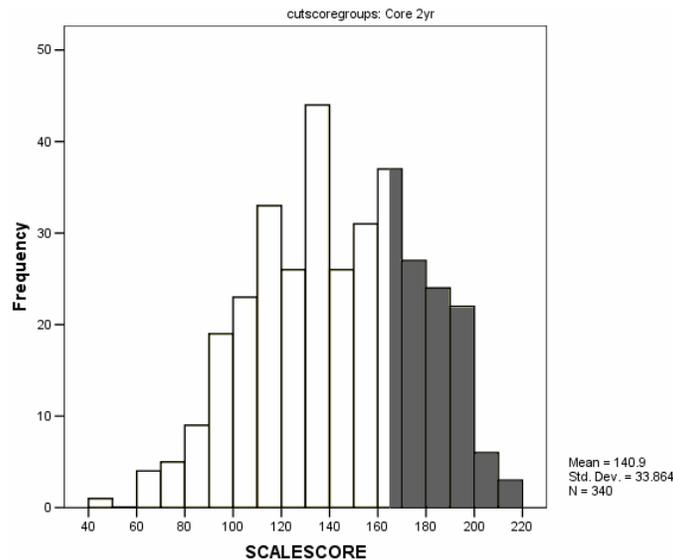
**Table 8**  
*Data on Cut Score Recommendations*

		Panel A (Core – Advanced iSkills assessments)	Panel B (Advanced – Core iSkills assessments)	Combined-panel recommendation	Range of acceptable cut scores (+/- 2 SEJ)
Core foundational level	Raw score (SD)	39.1 (5.9)	44.4 (4.0)	41.8 (5.6)	39.2 - 44.4
	Scale score	160	175	165	160 – 175
	% classified (CC 1 <sup>st</sup> years)	29%	16%	24%	29 – 16%
	% classified (4-year freshmen)	46%	26%	39%	46 – 26%
Intermediate foundational level	Raw score (SD)	38.8 (5.0)	39 (2.3)	38.9 (3.8)	37.1 – 40.7
	Scale score	575	575	575	570 – 580
	% classified (juniors & seniors)	27%	27%	27%	34 – 24%

*Note.* SD = standard deviation, SEJ = standard error of judgment.

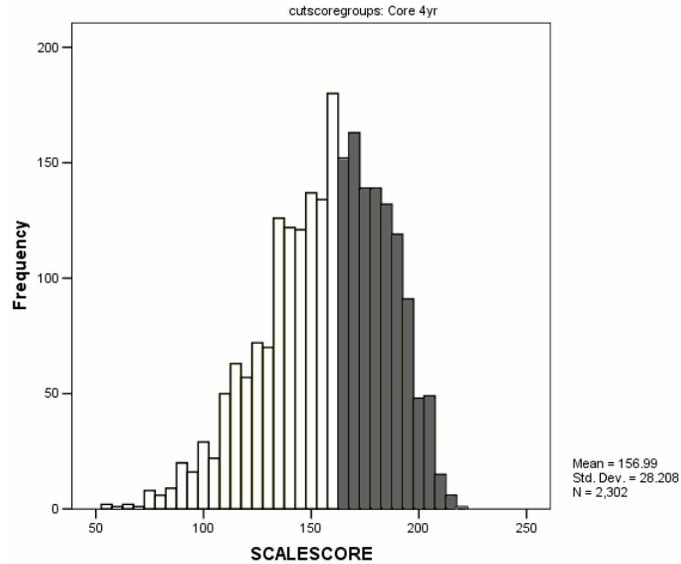
While the recommendation of Panel A on the core foundational level (39.1) appears to fall outside the range of acceptable cut scores (39.2–44.4), this discrepancy has no practical import as raw scores on the assessment are assigned in 0.5 increments: 39.1 and 39.2 correspond to the same scale score (160).

Figures 1 through 3 present histograms of scores for the three comparison groups of students described earlier: (a) first year students at community colleges and high school seniors that plan to attend a community college, (b) first year students at 4-year colleges and high school seniors that plan to attend a 4-year college, and (c) juniors and seniors at 4-year colleges. The impact of the recommended cut scores for these three groups are indicated by the colored bars: Gray bars indicate those students meeting or exceeding the recommended cut scores while white bars indicate students falling below the cut score. Note that shifting the recommended cut scores will change the proportion of students who meet or exceed a foundational level.



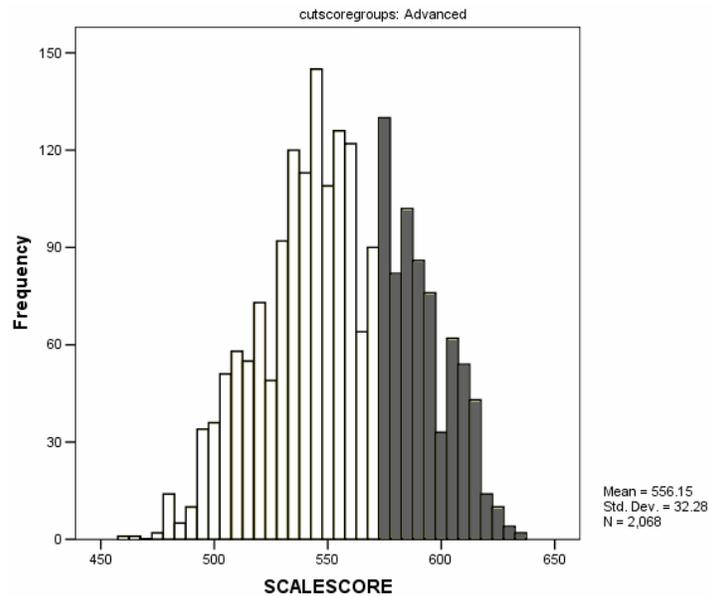
**Figure 1. Histogram of scores from first year students at community or technical colleges on the Core iSkills assessment.**

*Note.* Gray bars are at or above the consensus cut score of 165; white bars are below the cut score.



**Figure 2. Histogram of scores from freshmen at 4-year colleges or universities on the Core iSkills assessment.**

*Note.* Gray bars are at or above the consensus cut score of 165; white bars are below the cut score.



**Figure 3. Histogram of scores from juniors and seniors at 4-year colleges or universities on the Advanced iSkills assessment.**

*Note.* Gray bars are above the consensus cut score of 575; white bars are below the cut score.

### ***Final Evaluations***

Panelists completed an evaluation form at the conclusion of the standard-setting study. The evaluation form asked panelists to confirm some of their reactions from the initial evaluation form, but also asked for feedback regarding the standard-setting process, what influenced their judgments, and their comfort with the panel’s Round 3 (final) recommended cut score. Tables 9 through 11 present the results of the final evaluations.

All 18 panelists responded to each question. All panelists confirmed that they understood the purpose of the study, that things were explained clearly, and that the training they received adequately prepared them. All panelists indicated that they understood how the cut score was calculated and that the opportunity for feedback and discussion between rounds was helpful.

The majority of panelists reported that the definition of the JQC, their own professional experience, and the item-level data most influenced their judgments. All (100%) thought that the cut score reached for the Advanced iSkills assessment was about right; 17 of the 18 panelists (94%) thought the cut score reached for the Core iSkills assessment was about right.

**Table 9**

#### ***Final Evaluation: Overall Opinions***

	Strongly agree	Agree	Disagree	Strongly disagree	No response
I understood the purpose of the study.	18	0	0	0	0
The instructions and explanations provided by the room facilitator were clear.	17	1	0	0	0
The training in the standard-setting process adequately prepared me to make my standard-setting judgments.	11	7	0	0	0
The opportunity for feedback and discussion between rounds was helpful.	15	3	0	0	0
The inclusion of the item data was helpful.	17	1	0	0	0
The inclusion of the classification percentages was helpful.	14	3	1	0	0
The opportunity to reach consensus during the last day was helpful.	15	3	0	0	0
The overall process of making the standard-setting judgments was easy to follow.	11	7	0	0	0

**Table 10*****Final Evaluation: Influence of Materials and Data***

How influential was each of the following factors in guiding your standard-setting judgments?	Very influential	Somewhat influential	Not influential	No response
The definition of the <i>foundation levels</i>	16	2	0	0
The between-round feedback and discussions	10	7	1	0
The standard-setting judgments of other panelists	4	12	2	0
The item-level data	13	4	1	0
The classification percentages	8	7	3	0
My own professional experience	14	3	1	0

**Table 11*****Final Evaluation: Agreement With Recommended Cut Scores***

	Too low	About right	Too high	No response
The Round 3 (final) recommended cut score for the <u>Core</u> assessment is:	0	17	1	0
The Round 3 (final) recommended cut score for the <u>Advanced</u> assessment is:	0	18	0	0

**Conclusions**

This document reports a standard-setting study for the Core and Advanced iSkills assessments. The 18 panelists reported understanding the standard-setting process. Panelists also agreed with the consensus cut scores representing the mean of the two panels. The panel recommends that a cut score of 165 on the Core iSkills assessment corresponds to the core foundational level as set forth by the National ICT Literacy Policy Council. On the Advanced iSkills assessment, the panel recommends that a cut score of 575 corresponds to the intermediate foundation level. Because these recommendations were reached through the converging recommendations of independent subpanels, the National ICT Literacy Policy Council should feel confident that these cut scores reflect the defined foundational levels.

### **Postscript**

On October 11, 2007, the authors presented this report and recommendations to the National ICT Literacy Policy Council. In December 2007, after reviewing the report, the policy council approved the recommended cut scores.

## References

- Association of Colleges and Research Libraries. (2000). *Information literacy competency standards for higher education*. Retrieved August 24, 2007 from <http://www.ala.org/ala/acrl/acrlstandards/informationliteracycompetency.htm>
- Hambleton, R. K., & Plake, B. S. (1995). Using an extended Angoff procedure to set standards on complex performance assessments. *Applied Measurement in Education*, 8, 41–55.
- Katz, I. R. (2007). Testing information literacy in digital environments: The ETS iSkills™ assessment. *Information Technology and Libraries*, 26(3), 3–12.

## Notes

<sup>1</sup> The SEJ assumes that panelists were selected at random from a population of panelists. In most instances, including the current study, this is not likely to be true. Therefore, the SEJ should be interpreted as an approximation of each cut score's replicability.

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**Appendix A**  
**ETS Standard-Setting Team**

Irvin R. Katz, Co-Lead Facilitator & iSkills Assessment Specialist

Richard Tannenbaum, Co-Lead Facilitator

Patricia Baron, Process Facilitator

Margaret Redman, iSkills Assessment Specialist

Craig Stief, Data Manager

## **Appendix B**

### **Premeeting Assignments**

Colleagues:

The July 20-23 standard-setting (cut score) panel for the iSkills™ Core and Advanced assessments is fast approaching. We look forward to meeting and working with you on this important project; please see the attached draft agenda for an overview of the meeting. During the study we will provide you with the background information and training necessary to complete the standard-setting process. However, our experience shows that some pre-meeting preparation greatly facilitates the standard setting, making the process simpler and more rewarding for all participants. To that end, we ask that you complete the following “assignments” before you travel to the meeting.

**Please complete the following two assignments before July 17<sup>th</sup>:**

1. *Take both the Core iSkills assessment and the Advanced iSkills assessment.* Each assessment can be accessed via the attached instructions; please be sure to take both assessments. It is critical to the process that you become well-acquainted with the details of each assessment as well as the relative difficulty of the Core and Advanced assessments. The best way to achieve this goal is for you to go through the assessment as any test-taker would. The more familiar you are with each assessment, the easier it will be for you to judge the difficulty of the items for students, which is the focus of the standard-setting process. How well you do on the assessment will NOT be shared; this activity is strictly for you to better understand each assessment. If there are any issues you want to raise about particular tasks at the meeting, please be sure to note the assessment name (Core or Advanced) as well as some distinguishing content from the tasks (e.g., “Vietnam project,” “Great Garloo”).

Some of you might have already reviewed one or both of the iSkills assessments at some point in the past. However, if you have not taken both assessments for yourself in the past month, please use this opportunity to reacquaint yourself with the assessments.

2. *Please review the two foundational level descriptions (attached).* The foundational levels were developed by the National Policy Council and informed by the ACRL Standards. These descriptions articulate what ICT literacy skills students should have if they are meeting expectations. For the Core assessment, the foundational level describes what is expected of students who are leaving high school and entering their first year of college, either the first year of community college or the first year of a 4-year college/university program. For the Advanced iSkills assessment, the foundational level describes what is expected of students who either are entering their junior year in a 4-year program or entering the workforce.

As you review each level, please jot down one or two performance indicators for each of the seven skill areas in the definitions. Ask yourself, “what specifically would I expect to see (behavior or product) from a student who has the skill as described; what can she or he do?” We will continue this exercise during the meeting to help flesh out each foundational level. When you have finished reviewing the foundational levels, please write down your estimate of the percentage of the students you teach and/or interact with who meet or exceed the Foundation Level for (a) the Core assessment population (high school seniors and college freshmen) and (b) the Advanced assessment population (students moving to their junior year of college). **Please bring your notes to the July meeting.**

Also, if you have the time, please read the attached background paper on the iSkills assessment. This paper will provide you with an understanding of the purpose and goals of the assessments, and an understanding of how they were developed.

We do realize that your time is valuable and finite. But please do try to complete the first two assignments; and we encourage you—time permitting—to read the background paper.

***Finally, please acknowledge receipt of this e-mail.***

Again, we look forward to working with you!

Regards,

Irv Katz

Rick Tannenbaum

**Appendix C**  
**Meeting Agenda**

**July 20 – 23**  
**Agenda**

July 20, 2007

- 8:30 – 8:45 AM Introduction and welcome
- 8:45 – 9:05 Orientation to standard setting and workshop events
- 9:05 – 9:30 Discuss iSkills assessments
- 9:30 – 11:00 Flesh out foundational level descriptions
- 11:00 – 12:00 Standard setting training and practice
- 12:00 – 1:00 PM Lunch
- 1:00 – 5:00 Round 1 judgments (complete 50% to 75% of the items)
- 5:00 Adjourn (Day 1)

July 21, 2007

- 8:30– 10:30 AM Brief recap of previous day. Complete Round 1 judgments
- 10:30 – 10:45 Data entry; break
- 10:45 – 12:00 Discuss Round 1 judgments
- 12:00 – 1:00 PM Lunch
- 1:00 – 1:45 Discuss Round 1 judgments
- 1:45 – 2:30 Round 2 judgments (only for items you want to change)
- 2:30 – 2:45 Data entry; break
- 2:45- 4:00 Discuss Round 2 judgments
- 4:00- 4:45 Round 3 judgments (only for items you want to change)
- 4:45 Adjourn (Day 2); data entry

July 22, 2007

8:30 – 9:00 AM Review foundational level description for second iSkills test;  
discuss differences from other foundational level description

9:00 – 12:00 Round 1 judgments (for second iSkills test)

12:00 – 1:00 PM Lunch; data entry

1:00 – 2:30 Discuss Round 1 judgments

2:30 – 3:00 Round 2 judgments (only for items you want to change)

3:00 – 3:15 Data entry, break

3:15 – 4:00 Discuss Round 2 judgments

4:00 – 4:30 Round 3 judgments (only for items you want to change)

4:30 Adjourn (Day 3); data entry

July 23, 2007

8:30– 11:00 AM Consensus on final recommended cut scores; completion of final  
evaluation form

11:00 – 11:15 Wrap up and adjourn (end of workshop)

Breaks at approximately 10:30 AM and 3:00 PM each day (except July 23)

**Appendix D**  
**ETS Nondisclosure Agreement**

This Non-Disclosure Agreement (the “Agreement”) is effective as of the date written below between Educational Testing Service, located at Rosedale Rd., Princeton, NJ 08541 (“ETS”) and the individual as listed below (the “Participant”). This Agreement is based on the understanding that both ETS and the Participant have mutually beneficial interests. This Agreement will facilitate discussions and dealings between ETS and the Participant regarding the iSkills Assessment Cut Score Panel Meeting (the “Purpose”). ETS and the Participant recognize that such discussions may involve the disclosure of confidential information and agree to protect this confidential information from unauthorized use and disclosure. In consideration of the disclosure of such information by ETS, the parties agree as follows:

This Agreement will apply to any confidential and proprietary information disclosed by ETS including, any information concerning ETS’s product development plans, technology, software, intellectual property, marketing or customer information, financial information, trade secrets, business plans, any student, examinee or candidate testing or demographic data, and whether such information is in written, oral or visual form (collectively, “Confidential Information”).

Participant agrees to hold ETS’s Confidential Information in confidence, not to disclose such Confidential Information to any individual or company (except as may be required within Participant’s institution or organization for the sole purpose of furthering the Purpose), and not to use any Confidential Information for any purpose except for the Purpose stated above. Confidential Information will not include information which: is generally known or available to the public; was lawfully known by the Participant prior to the effective date of this Agreement; or was acquired from a third party which has no obligation of confidentiality to ETS.

If Participant or ETS decides not to proceed with the Purpose, it will promptly notify the other. Upon ETS’s request, the Participant will promptly return all tangible items received from ETS and all copies thereof, and will destroy any abstracts or summations of such information it has made. The Participant agree that nothing contained in this Agreement grants any rights to it, by license or otherwise, to any Confidential Information except as specified in this Agreement.

This Agreement will be governed by the laws of the State of New Jersey (excluding its body of law controlling conflicts of law). The terms and conditions of this Agreement shall inure

to the benefit of and be binding upon the respective successors and assigns of the parties hereto. If any provision of this Agreement is or becomes illegal, or unenforceable, the remaining portions of the Agreement shall remain separately valid and in full force and effect.

The Participant has executed this Agreement by signing below.

The "Participant":

By: \_\_\_\_\_

Signature

Name, Title: \_\_\_\_\_

Date: \_\_\_\_\_

**Appendix E**  
**Panelist Biographical Data Form**

**National ICT Literacy Cut Score Panel**  
**Panelist Biographical Data Form**

Your Name: \_\_\_\_\_

Panelist's Name: \_\_\_\_\_

Panelist's Address: \_\_\_\_\_

Panelist's City, State, Zip: \_\_\_\_\_

Panelist's Institution Name: \_\_\_\_\_

1. Does the panelist teach or in some other way work with students and have an opportunity to observe their ICT literacy skills?

\_\_\_\_\_ Yes                      \_\_\_\_\_ No

If "yes," indicate the population with whom the panelist primarily interacts (e.g. high school seniors, college freshmen, employees, etc.) and the nature of his/her responsibilities:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Please summarize the panelist's qualifications as an ICT Literacy expert and a person knowledgeable about student/employee ICT literacy abilities:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Does the panelist work with other ICT-oriented teaching professionals and have a good working knowledge of the ICT Literacy skills needed to succeed in higher education and/or the workplace?
- \_\_\_\_\_ Yes                      \_\_\_\_\_ No
4. How do you expect that the panelist describes himself/herself? (check all that apply)
- \_\_\_\_\_ American Indian or Alaskan Native  
 \_\_\_\_\_ Asian, Asian American, or Pacific Islander  
 \_\_\_\_\_ Black or African American  
 \_\_\_\_\_ Mexican, Mexican American, or Chicano  
 \_\_\_\_\_ Puerto Rican  
 \_\_\_\_\_ Other Hispanic or Latin American  
 \_\_\_\_\_ Middle Eastern / North African  
 \_\_\_\_\_ White (non-Hispanic)  
 \_\_\_\_\_ Some other way not listed above (please specify): \_\_\_\_\_
5. Panelist's gender:
- \_\_\_ Female                      \_\_\_ Male
6. Region of country where the panelist teaches or works:
- \_\_\_\_\_ East      \_\_\_\_\_ Midwest      \_\_\_\_\_ Northwest  
 \_\_\_\_\_ West      \_\_\_\_\_ South      \_\_\_\_\_ Southwest
7. Panelist's institutional location:
- \_\_\_\_\_ Urban                      \_\_\_\_\_ Suburban                      \_\_\_\_\_ Rural
8. Panelist's institutional type:
- \_\_\_\_\_ High School      \_\_\_\_\_ Community/Technical College  
 \_\_\_\_\_ Four-year College or University      \_\_\_\_\_ Employer
9. Number of students at panelist's institution: \_\_\_\_\_
10. If an Employer, what type of organization (e.g., service, technology, manufacturing, transportation, health, financial, . . . ): \_\_\_\_\_
11. What is your recommendation on Cut Score panel assignment for this person:
- \_\_\_\_\_ Core level. *The Core level assesses readiness to meet the ICT literacy challenges of higher education. It is taken by high school seniors and college freshmen.*
- \_\_\_\_\_ Advanced level. *The Advanced level assesses readiness to meet the ICT literacy challenges of upper-division coursework, including transitioning from a 2-yr institution to a 4-yr institution or the workforce. It is taken by college sophomores or juniors.*

**Appendix F**  
**Foundational Level Descriptions**

**Core Foundational ICT Literacy Skills**  
(relevant to Core iSkills assessment)

Demonstrate abilities to define tasks and needs, and to access and manage information in an effective, efficient, and ethical manner through the appropriate selection and application of information and communication technology to succeed in lower division (postsecondary) studies and/or the workplace.

**Define:** Articulate a need for information as one or more relevant, focused, and manageable questions. Know where to locate and gain understanding of acceptable, common definitions of terms associated with the needed information.

**Access:** Search, find, and retrieve information from a variety of print and electronic resources (e.g., databases, Internet).

**Evaluate:** Judge the currency, appropriateness, and adequacy of information and information sources for a specific purpose.

**Manage:** Conduct a rudimentary and preliminary organization of accessed information for retrieval and future application.

**Integrate:** Extract and combine information from a variety of sources and draw fundamental conclusions.

**Create:** Summarize and adapt information to describe an event, express an opinion, or support a basic argument, viewpoint, or position.

**Communicate:** Adapt and present information for a peer audience.

## **Intermediate Foundational ICT Literacy Skills**

(relevant to Advanced iSkills assessment)

Demonstrate abilities that build on the core foundational skills of ICT literacy (define, access, manage, and use information). The learner selects and applies appropriate ICT tools to synthesize, integrate, and assimilate information, to evaluate evidence and infer conclusions, to create and reflect on information processes and products, and to communicate results in a persuasive, ethical, and legal manner. These abilities are demonstrated at a skill level necessary to succeed in 3<sup>rd</sup> year postsecondary studies and/or the workplace.

**Define:** Articulate a need for information that defines a hypothesis or problem in operational terms.

**Access:** Develop and apply a systematic strategy for ethically and legally finding, retrieving, and sorting information from a variety of relevant sources, representing a wide spectrum of perspectives, acknowledging sources appropriately.

**Evaluate:** Judge veracity, bias, primacy, persuasiveness, and completeness of information and information sources for a specific purpose.

**Manage:** Develop and apply a comprehensive system to classify and prioritize information in order to identify and clarify interrelationships.

**Integrate:** Synthesize information from a variety of sources and perspectives, compare and contrast arguments, identify trends and patterns, and infer conclusions.

**Create:** Generate information new to the learner through critical review and revision of assimilated information. Develop supported arguments and warranted conclusions to address the task at hand.

**Communicate:** Communicate information persuasively to meet needs of various audiences through the use of an appropriate medium.

## Appendix G

### Initial Evaluation/Ready-to-Proceed Form

Panelist ID \_\_\_\_\_

**iSkills™**

### Initial Evaluation/Ready-to-Proceed Form

Please read each statement and place an "X" in the box to represent your response.

	Strongly Agree	Agree	Disagree	Strongly Disagree
• I understand the purpose of the study.				
• The facilitators explained things clearly during the large-group session.				
• I understand the definitions of the Foundational Levels.				
• The training in the standard setting process adequately prepared me to make my standard setting judgments.				
• The explanation of how the recommended cut scores are computed was clear.				
• The opportunity to practice helped clarify the standard setting task for me.				
• I understand how to make the standard setting judgments.				

**I am ready to proceed** and to make my standard setting judgments.

\_\_\_\_\_ Yes      \_\_\_\_\_ No

If no, what other information/explanations do you need before making your standard setting judgments?

---

---

---

---

Date \_\_\_\_\_

Signature \_\_\_\_\_

## Appendix H

### Final Evaluation Form

Panelist ID \_\_\_\_\_

### iSkills™ Final Evaluation Form

**Please read each statement and place an "X" in the box to represent your response.**

	Strongly Agree	Agree	Disagree	Strongly Disagree
• I understood the purpose of the study.				
• The instructions and explanations provided by my room facilitator were clear.				
• The training in the standard setting process adequately prepared me to make my standard setting judgments.				
• The opportunity for feedback and discussion between rounds was helpful.				
• The inclusion of the item data was helpful.				
• The inclusion of the classification percentages was helpful.				
• The opportunity to reach consensus during the last day was helpful.				
• The overall process of making the standard setting judgments was easy to follow.				
<b>How influential was each of the following factors in guiding your standard setting judgments?</b>				
	Very Influential	Somewhat Influential	Not Influential	
• The definition of the Foundational levels				
• The between-round feedback and discussions				
• The standard setting judgments of other panelists				
• The item-level data				
• The classification percentages				
• My own professional experience				

**The Round 3 (final) recommended cut score for the Core assessment is:** (Check one.)

Too Low                       About Right                       Too High

**The Round 3 (final) recommended cut score for the Advanced assessment is:** (Check one.)

Too Low                       About Right                       Too High

**If you would like to add comments, please use the back of this form.**

**Appendix I**  
**List of Panelists**

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Ismail	Abdullahi	North Carolina Central University	Durham, NC
Penny	Beile	University of Central Florida	Orlando, FL
Diego	Bonilla	California State University, Sacramento	Sacramento, CA
Stephanie	Brasley	California State University Chancellor's Office	Long Beach, CA
Charles	DeSassure	Tarrant County Community College	Arlington, TX
Valerie	Edwards	Monona Grove High School	Monona, WI
Donald	Forbes	Guilford Technical Community College	Jamestown, NC
Mary Ann	Harlan	Arcata High School	Arcata, CA
Patricia	Harris	Oakland Community College	Auburn Hills, MI
Angela E.	Hedley	Health Careers Academy High School	Boston, MA
Gerald (Joe)	Jernigan	Tarrant County Community College	Fort Worth, TX
Yves	Labissiere	Portland State University	Portland, OR
LaRoi	Lawton	Bronx Community College	Bronx, NY
Emily M.	Okada	Indiana University	Bloomington, IN
Edward	Owusu-Ansah	Kingsborough Community College	Brooklyn, NY
Carrol	Perrino	Morgan State University	Baltimore, MD
Dawn P.	Vaughn	Cherry Creek High School	Greenwood Village, CO
Ann	Vickman	South Texas Independent School District - Biblioteca Las Américas	Mercedes, TX

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