Preparing for Macao PISA 2009:
Electronic Reading Assessment Test Delivery System
and Released Tasks

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For the sake of maximizing the utilization of this monograph (in English) by the Chinese schools. There is a parallel Chinese version as well (forthcoming). Interested readers can access the website (i.e. http://erasq.acer.edu.au) for the English version of the ERA test units, and acknowledgement should directly be made to this website when released test units and coding guides are drawn for schools’ internal assessment. Please contact Macau-PISA Centre for the login password to the above website.
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Chapter 1
Introduction

Macao, a special administrative region of People’s Republic of China, participated in PISA 2009 reading literacy study. In this study, Electronic Reading Assessment (ERA) is regarded as an innovation in international comparative education. It is treated as a minor domain similar to that of mathematics and science in literacy assessment. Unlike print-based assessment, ERA is conceived of as a form of computer-based assessment system. Based on the Professional Practice Board Steering Committee on Test Standards (2002), this monograph examines this special form of computer-based assessment with reference to each of its four operative components, namely: (1) assessment generation; (2) assessment delivery; (3) assessment scoring and interpretation; and (4) storage, retrieval and transmission.

According to Green and associates’ (1995) guidelines for computerized test development and use in education, this monograph clarifies how PISA Consortium work hand in hand with the national centers (e.g. Macau-PISA Centre) to: (1) elucidate target examinee population and definition of ERA constructs; (2) explicate ERA framework and the associated reading literacy constructs; (3) design item pools with pre-designed characteristics (e.g. situation, reading aspect, text type and item format) with desirable item qualities; (4) familiarize students with sample items and the computer-based assessment system; (5) conduct testing in designated test centers following agreed test administration procedures; (6) distribute randomly to students different test forms with a timed “lock-step” item design; (7) facilitate coding of multiple choice and open constructed response data and improve security of online transmission of assessment data to PISA Consortium; and (8) scale student response data in accordance with item response theory, alongside imputation of ERA scores for missing data and analyses of country DIF items (i.e. items with country differential item functioning). These eight issues are central to the fulfillment of the eight guidelines because they are of paramount importance to the conceptualization and functionalities of the four operative components of the computer-based ERA assessment system under research and development.

Normally it is not possible to discuss the above eight issues in concrete terms without disclosing the contents of the test items and the internal architecture of the computer-based assessment system. It is heartening to learn that after the field trial by twenty three countries/economies in 2008, two test units of ERA items (i.e. PHISHING and LET’S SPEAK) that are not selected for various reasons for the PISA 2009 Main Survey (MS09) were released by the PISA consortium for public scrutiny (see Chapter 2 and 3 of this monograph). This allows the present authors to make use of the two test units of released tasks and the associated coding guides to elucidate the PISA approach of international electronic reading assessment.

For the time being, PISA consortium is busy reviewing Field Trial 2009 test data and making use the item analyses feedback to refine conceptualization of the conduct of Main Survey 2009. Therefore, it is not possible to obtain international data for a comprehensive elucidation. In spite of this, it is possible to use Macao 15-year-olds’ field trial results to demonstrate how electronic reading assessment is designed to satisfy the requirements of the PISA assessment framework, and open constructed response data are coded reliably online according to the international coding guides.
Chapter 2
Design of ERA Test Delivery System

2.1 Definition of reading literacy

*Reading literacy* is understanding, using and reflecting on and engaging with written texts, in order to achieve one’s goals, to develop one’s knowledge and potential and to participate in society (OECD, 2007a, p.14).

2.2 Guidelines and issues of computer-based assessment

Before elucidating the ERA design features and implementation logistics, it is good to introduce the eight guidelines of computer-based assessment (Green, et al., 1995). Relevant to each of these eight guidelines it is advantageous to highlight issues negligent treatment of which may have potential threats to the reliability and validity of electronic reading literacy assessment (see Table 1).

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Issues needed examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The computerized testing system should be appropriate for the purpose of test</td>
</tr>
<tr>
<td>2</td>
<td>The psychometric model underlying the computerized test should be appropriate for the construct being measured</td>
</tr>
<tr>
<td>3</td>
<td>The item pool should be of appropriate quality to support the test purposes and to measure the examinee population</td>
</tr>
<tr>
<td>4</td>
<td>Examinees should be well trained in the use of the computer testing system</td>
</tr>
<tr>
<td>5</td>
<td>Software and hardware requirements of the computerized test delivery system should allow for the test to be administered in a fair and professional manner</td>
</tr>
<tr>
<td>6</td>
<td>The item-selection algorithm and stopping rule should be appropriate for the purpose of the test</td>
</tr>
</tbody>
</table>
7 The security should protect the integrity of the computerized test and the examinees’ score records

Facilitate coding of multiple choice and open constructed response data and improve security of online transmission of assessment data to PISA Consortium

8 The technical quality of test results should be sufficient for the purposes of score interpretation

Scale student response data in accordance with item response theory, alongside imputation of ERA scores for missing data and analyses of items with differential item functioning

2.3 Design features and implementation logistics

Based on the Guidelines for the development and use of computer-based assessment, four components for the delivery of online reading literacy assessment are delineated: (1) Assessment generation; (2) Assessment delivery; (3) Assessment scoring and interpretation; and (4) Storage, retrieval and transmission (Professional Practice Board Steering Committee on Test Standards, 2002). Figure 1 shows schematically what these four operative components entail.

**Figure 1**: The four operative components for the delivery of online reading literacy assessment

2.3.1 Assessment generation

ERA assessment framework incorporates the print reading assessment framework (see Figure 2 for the five aspects of print-based reading literacy) used by countries to assess their 15-year-old students’ reading literacy not only in the print medium but also online electronically. Figure 3 and 4 depict relationships amongst tasks, texts and reading aspects in the print and electronic medium.
Reading Literacy

- Use information primarily from within the text
- Focus on independent parts of the text
- Retrieve information
- Reflect and evaluate
- Develop an interpretation
- Form a broad understanding
- Whole text
- Relationships among parts of text

- Draw upon outside knowledge
- Focus on relationships within the text
- Reflect on and evaluate content of text

- Focus on content
- Focus on structure
- Reflect on and evaluate form of text

**Figure 2:** The five aspects of print-based reading literacy (OECD, 2007b)

**Figure 3:** Relationships amongst tasks, texts and reading aspects in the print medium (OECD, 2007b & 2007c)
Referring to this reading assessment framework, both print and ERA test items typically require students to retrieve information, form a broad understanding, develop an interpretation, as well as reflect on and evaluate content and form of text. These are known as the five aspects of reading. The main difference between print and ERA assessment is that the former is fixed text with defined boundaries whereas the latter is dynamic text with blurred boundaries such as multiple texts in the form of linked webpage with navigation tools and features. Table 2 compares print reading and electronic reading in terms of test unit characteristics, whereas Table 3 makes a contrast in terms of the five reading aspects (see Cheung & Sit, 2008a, p.3-8, for a delineation of test unit characteristics of print assessment; see also OECD, 2007c for a comparison of print and electronic reading in terms of the reading aspects).

**Table 2: Comparison of print and electronic reading in terms of test unit characteristics**

<table>
<thead>
<tr>
<th>Test Unit Characteristics</th>
<th>Print Reading</th>
<th>Electronic Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Environment</td>
<td>None</td>
<td>Authored sites; Message based sites</td>
</tr>
<tr>
<td>2. Situation</td>
<td>Personal; Public; Occupational; Educational</td>
<td>Personal; Public; Occupational; Educational</td>
</tr>
<tr>
<td>3. Item Format</td>
<td>Continuous; Non-continuous; Mixed; [Multiple]</td>
<td>[Continuous]; [Non-continuous]; Mixed; Multiple</td>
</tr>
<tr>
<td>4. Text Type</td>
<td>Argumentation; Description; Exposition; Narration; Instruction</td>
<td>Argumentation; Description; Exposition; Transaction</td>
</tr>
</tbody>
</table>

*Note: Texts in square brackets indicate this feature is given relatively little emphasis in the PISA assessment framework*
<table>
<thead>
<tr>
<th>Reading Aspect</th>
<th>Print Reading</th>
<th>Electronic Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Access and Retrieve</strong></td>
<td>Orient and navigate in concrete information space, (\text{e.g. Go to library, search in a catalogue, find a book}) (\rightarrow) Use navigation tools and structures, (\text{e.g. Table of contents; page numbers; glossary}) (\rightarrow) Select and sequence information (low reader control; one sequence of linear reading)</td>
<td>Orient and navigate in abstract information space, (\text{e.g. Enter URL; Google}) (\rightarrow) Use navigation tools and structures, (\text{e.g. Menus; embedded hyperlinks}) (\rightarrow) Select and sequence information (high reader control; multiple sequences of linear reading)</td>
</tr>
<tr>
<td><strong>2. Integrate and Interpret</strong></td>
<td>Integrate at a lower level of demand: larger portions of text are simultaneously visible (one or two pages) (\rightarrow) Develop an interpretation (\rightarrow) Form a broad understanding</td>
<td>Integrate at a higher level of demand: limited parts of text are simultaneously visible (limited by screen size) (\rightarrow) Develop an interpretation (\rightarrow) Form a broad understanding</td>
</tr>
<tr>
<td><strong>3. Reflect and Evaluate</strong></td>
<td>Pre-evaluate information, (\text{e.g. use table of contents; skim passages, checking for credibility and usefulness}) (\rightarrow) Evaluate credibility of source (usually less important due to filtering and pre-selection in the publishing process) (\rightarrow) Evaluate plausibility of content (\rightarrow) Evaluate coherence and consistency (\rightarrow) Hypothesize (\rightarrow) Reflect in relation to personal experience</td>
<td>Pre-evaluate information, (\text{e.g. use menus; skim web pages, checking for credibility and usefulness}) (\rightarrow) Evaluate credibility of source (usually more important due to lack of filtering and pre-selection in open environment) (\rightarrow) Evaluate plausibility of content (\rightarrow) Evaluate coherence and consistency (\rightarrow) Hypothesize (\rightarrow) Reflect in relation to personal experience</td>
</tr>
<tr>
<td><strong>4. Complex</strong></td>
<td>The range of sources to be consulted is relatively undefined. The sequence of steps within the task is undirected, (\text{e.g. finding, evaluating and integrating information from multiple printed texts})</td>
<td>The range of sources to be consulted is relatively undefined. The sequence of steps within the task is undirected, (\text{e.g. finding, evaluating and integrating information from multiple electronic texts})</td>
</tr>
</tbody>
</table>
Table 4 summarizes the percentage of different categories of ERA tasks selected in the Main Survey 2009. The tasks have been mapped against the characterizing features of the ERA framework. This has a bearing on the interpretation and use of the ERA measures. Upon validation of the coding guides after the Main Survey 2009, the exact percentage of each of the characterizing features of the ERA framework contributing to the composition of the ERA constructs can be ascertained accordingly.

**Table 4: Percentage of different categories of ERA tasks selected in Main Survey 2009**

<table>
<thead>
<tr>
<th>Characterizing Features of ERA Framework</th>
<th>Tasks (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Situation</td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>32.1</td>
</tr>
<tr>
<td>Public</td>
<td>44.6</td>
</tr>
<tr>
<td>Occupational</td>
<td>10.7</td>
</tr>
<tr>
<td>Educational</td>
<td>12.5</td>
</tr>
<tr>
<td>2. Environment</td>
<td></td>
</tr>
<tr>
<td>Authored sites</td>
<td>67.9</td>
</tr>
<tr>
<td>Message-based sites</td>
<td>25.0</td>
</tr>
<tr>
<td>Mixed</td>
<td>7.1</td>
</tr>
<tr>
<td>3. Text Type</td>
<td></td>
</tr>
<tr>
<td>Argumentation</td>
<td>22.6</td>
</tr>
<tr>
<td>Description</td>
<td>31.5</td>
</tr>
<tr>
<td>Exposition</td>
<td>35.7</td>
</tr>
<tr>
<td>Transaction</td>
<td>10.1</td>
</tr>
<tr>
<td>4. Reading Aspect</td>
<td></td>
</tr>
<tr>
<td>Access and Retrieve</td>
<td>25.0</td>
</tr>
<tr>
<td>Integrate and Interpret</td>
<td>39.3</td>
</tr>
<tr>
<td>Reflect and Evaluate</td>
<td>21.4</td>
</tr>
<tr>
<td>Complex</td>
<td>14.3</td>
</tr>
<tr>
<td>5. Item Format</td>
<td></td>
</tr>
<tr>
<td>Multiple Choice</td>
<td>64.3</td>
</tr>
<tr>
<td>Open Constructed Response</td>
<td>28.6</td>
</tr>
<tr>
<td>Complex Multiple Choice</td>
<td>7.1</td>
</tr>
</tbody>
</table>

**2.3.2 Assessment delivery**

The TAO (French acronym for “Testing Assisté par Ordinateur”) is used to deliver ERA. It is designed as a modular assessment platform for collaborative and distributed computer-based assessment delivery and management (Cheung & Sit, 2008b; Goldhammer, et al., 2008; Latour, et al., 2008). Typically, ERA is delivered on school computers via a USB flash drive or CD-ROM. As shown in the ERA delivery system interface, there is a time-bar at the top of the screen to show how much time in the testing session the student has left (see Figure 5). Also, the question numbers change colour as the student has completed them. There is a Help button with general instructions about features of the system. Students are able to copy and paste and to use a Find function within a web-style page.

The TAO system, once operational, will capture time taken for each response, and the pathways and links followed by the student within each task. It is noteworthy that both
test units and cluster of tasks within test units are delivered in a fixed ‘lockstep’ fashion, i.e. the examinee will not be able to return to a task or test unit once they have moved to the next one. Each time the student clicks the next button on the test the examinee is informed about to move on to the next task and it will not be possible to return to the previous task. This approach enables test developers to specify the starting page for each task. In this way, all students begin in the same place within the stimulus and, if they have navigated through a series of less relevant pages, do not have to find their way back to begin the task. The stimulus materials are situated in the browser area and the task in the task area. There is a variety of Chinese-input methods for use by the students to respond to open constructed response tasks (e.g. E022Q09). The TAO system is able to register mouse clicks made at both browser and task areas.

Figure 5: The ERA delivery system interface

2.3.3 Assessment scoring and interpretation

As seen in Table 4, most of the ERA tasks are of the multiple-choice, and responses are automatically captured by TAO. Same arrangement is also made for the closed constructed response. For the open constructed response tasks, manual online coding by trained coders in accordance with coding guides are needed. Using E022Q09 (LET’S SPEAK) as an example, students’ responses are coded against the required standards as illustrated by international workshop examples. Shown below is Task E022Q09 (LET’S SPEAK) needed constructed responses from examinees. Table 5 presents the coding guides of this task illustrated with coding of student responses of Macao’s 15-year-olds.
in the Field Trial 2009.

**Task E022Q09 (LET'S SPEAK):**

Look at Mischa’s post for March 10. Click on “Write a Reply” and write a reply to Mischa. In your reply, answer her question about which writer, in your opinion, knows the most about this issue. Give a reason for your answer. [Note: use the Back button to refer to the Forum page.]

Click “Post Reply” to add your reply to the forum.

**Table 5:** E022Q09 (LET’S SPEAK) coding guide illustrated with student responses of Macao’s 15-year-olds in the Field Trial 2009

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identifies Doctor Nauckunaite and/or Psychologist O.L. (explicitly or implicitly) AND refers to their professional status. May express scepticism about their professional status.</td>
<td>我覺得心理學家(Psychologist)知道得多，如果要我相信的話，我寧可相信一些有科學的事實。</td>
</tr>
<tr>
<td></td>
<td>Identifies any of the four writers named by Mischa (Julie, Tobias, Psych OL, or Dr. Nauckunaite) AND gives a reason that is consistent with the text, related to the cogency, practicality or logic of the text.</td>
<td>我認爲嘉穎(Tobias)對公開演講知道最多。因爲她說了一個重點，就是公開演講是需要經驗的，沒有人是一出生就懂得公開演講的技巧的。</td>
</tr>
<tr>
<td></td>
<td>Names any of the writers without explanation.</td>
<td>羅莉(Julie)知道得最多。</td>
</tr>
<tr>
<td>0</td>
<td>Gives insufficient or vague answer.</td>
<td>骆君麗博士(Doctor Nauckunaite)，因爲她可以教我們怎去克服演講時的困難。</td>
</tr>
</tbody>
</table>

* Please refer to the coding guide in Section 3.2.4 for details; words in brackets are added by the authors to clarify names and rectify incorrect use of words by the examinees.
One finding of the Field Trial 2009 is that Macao’s 15-year-olds are more used to answering multiple choice items by clicking answer boxes than typing in constructed responses using Chinese input methods. They are less inclined to secure full credits for open constructed responses demanding reflection and evaluation of materials read.

2.3.4 Storage, retrieval and transmission

OECD requires that any computer-delivered assessment in PISA 2009 be implemented using existing school infrastructure. ERA is based on a test delivery system that runs off its own operating system so that all students will use the same Linux operating system and the same browser loaded from the bootable CD/USB. Using a bootable medium ensures that the security of the test units by preventing their copying elsewhere. Additionally, it avoids problems associated with internet use such as inadequate upload/download speeds and bandwidths, computer security settings, as well as local and system-wide firewalls. For the ERA Field Trial, five 15-minute test units (i.e. clusters of items/tasks) are developed. These are arranged into five electronic forms (i.e. AB, BC, CD, DE and EA), so that each cluster appears first in one form and second in another form. For the ERA Main Survey, three 15-minute test units (i.e. clusters of tasks) are developed. These are arranged into six electronic forms (i.e. AB, BA, BC, CB, CA and AC) so that each cluster appears first in one form and second in another form.

In this way, tasks are bundled together into a number of test forms each consists of a number of test units on a CD/USB with a Linux-based operating system, a TAO assessment platform and a Mozilla Firefox web browser for viewing the TAO interface. Flash media player is included to enable the viewing of the stimulus material and student responses are stored in RAM during the testing session and written to a USB stick at the conclusion of the test. For security reasons, each CD/USB, not altered during the testing session, must be recovered at the conclusion of an ERA session. It can be reused in a subsequent session. In Macao, test security is guaranteed because all ERA assessments are centralized in designated test centres, and online transmission of assessment results stored in the USB sticks to Australian Council for Educational Research (ACER) are done centrally at Macau-PISA Centre.
Chapter 3
ERA Released Test Units and Coding Guides

The coding process is a vigorous one. It is done online using Online Coding System supplied by the PISA Consortium. Except for multiple choice and closed constructed tasks the responses of which are automatically captured, all open constructed response questions need to be coded in accordance with internationally coding guides. To ensure consistency of ratings so as to achieve maximal reliability the tasks are coded one by one using a team of qualified coders. Section 3.1 and 3.2 details the coding guide of the two released ERA test units, alongside delineation of question intent and access paths pertinent to answering them correctly (see Figure 6-12 for details).

3.1 Released ERA test unit E010: PHISHING
This released test unit consists of 3 tasks, all are of multiple choice format. These three tasks are presented below in the same order of assessment received by the examinees.
3.1.1 Task 1: E010Q02 (PHISHING)

PHISHING: Task 1

You are at the home page of the Online Phishing Resource Site. According to the information on this page, which one of the following is a feature of a phishing e-mail?

A. It asks for personal information.
B. It contains unwanted advertising.
C. It offers a genuine service.
D. It comes from a well-known company.

Question intent:

Access and retrieve: Retrieve information

Locate an important component of an explicitly stated definition

Access paths:

Based on the information shown on Online Phishing Resource Site to retrieve the correct answer to the multiple choice question. (n.b. Blue dotted arrow shows where the answer is located; there is no need to click to another webpage)

Coding guide:

Full Credit

Code 1: A. It asks for personal information.

No Credit

Code 0: Other responses.

Code 9: Missing.

Figure 6: Access structure pertinent to answering E010Q02 (PHISHING)
### 3.1.2 Task 2: E010Q01 (PHISHING)

**PHISHING: Task 2**

How many phishing e-mails are sent around the world in an average month?

- A 1,200.
- B over 6 billion.
- C about 25,000.
- D 55,000.

**Question intent:**

Access and retrieve: *Retrieve information*

Identify the reference of a number in a list

**Access paths:**

Based on the information shown on *Online Phishing Resource Site* to retrieve the correct answer to the multiple choice question. (Blue dotted arrow shows where the answer is located; no need to click to another webpage)

**Coding guide:**

**Full Credit**

Code 1: B. over 6 billion.

**No Credit**

Code 0: Other responses.

Code 9: Missing.

**Figure 7:** Access structure pertinent to answering E010Q01 (PHISHING)
3.1.3 Task 3: E010Q04 (PHISHING)

PHISHING: Task 3

Which of the following tricks is explained on the “Recognising Phishing” page?

A  The e-mail asks the recipient to donate money to a fake charity.
B  The phishing e-mail installs spyware on the user’s computer.
C  The author of the e-mail inserts a fake link to a fake website.
D  The e-mail pretends the recipient has won a prize.

Question intent:
Access and retrieve: Retrieve information
Locate explicitly stated information

Access paths:
Click a series of hyperlinks in Recognizing Phishing to go to other webpage so as to retrieve the correct answer to the multiple choice question. (n.b. The four hyperlinks are located at where the blue dotted line points to, and to where they are linked are shown in red small dotted lines. Students may choose to click these four hyperlinks in any order they like to retrieve information.)

Coding guide:

Full Credit
Code 1: C. The author of the e-mail inserts a fake link to a fake website.

No Credit
Code 0: Other responses.
Code 9: Missing.

Figure 8: Access structure pertinent to answering E010Q04 (PHISHING)
3.2 Released ERA test unit E022: LET’S SPEAK
This released test unit consists of 4 tasks. The first three tasks are of multiple choice format whereas the fourth is of open response format. These four tasks are presented below in the same order of assessment received by the examinees.

3.2.1 Task 1: E022Q01 (LET’S SPEAK)

**LET’S SPEAK: Task 1**
Who wrote the first reply to Mischa in this Internet forum discussion?

A. Julie.
B. Mark.
C. Dr. Nauckunaite.
D. Tobias.

**Question intent:**
Integrate and interpret: *Develop an interpretation*
*Recognise the sequence of posts in a forum discussion*

**Access paths:**
Based on the information shown on *Education Network Forums* to develop an interpretation of its layout format so as to answer the multiple choice question.
(Blue dotted arrow shows where the answer is located; no need to click to another webpage)

**Coding guide:**
- **Full Credit**: D. Tobias.
- **No Credit**: Code 0: Other responses. Code 9: Missing.

**Figure 9**: Access structure pertinent to answering E022Q01 (LET’S SPEAK)
LET’S SPEAK: Task 2

Lauren writes, “Even if you are very scared of speaking in public, there are things you can do to overcome your fear.” Which writer would be most likely to disagree with Lauren’s statement?

A. Julie.
B. Tobias.
C. Psychologist O.L.
D. Dr. Z. Nauckunaite.

Question intent:
Integrate and interpret: Develop an interpretation
Compare two arguments to recognise a contrast

Access paths:
Based on the information shown on the Education Network Forums to develop an interpretation to answer the multiple choice question. (Blue dotted arrow shows where the answer is located; no need to click to another webpage)

Coding guide:
Full Credit:
A. Julie.

No Credit:
Code 0: Other responses.
Code 9: Missing.

Figure 10: Access structure pertinent to answering E022Q04 (LET’S SPEAK)
3.2.3 Task 3: E022Q08 (LET’S SPEAK)

LET’S SPEAK: Task 3

Find the article by Doctor Nauckunaite. Which one of the following suggestions does Doctor Nauckunaite make?

A  A casual and relaxed attitude is most effective when you give a speech.
B  If you think about your audience, you will worry less about yourself.
C  If you can hide the fact that you are afraid, you will feel less afraid.
D  It is safest to memorise your whole speech before you start.
E  It is best to look at different sections of the audience in turn during your speech.

Question intent:
Integrate and interpret: Develop an interpretation
Recognize which one of a set of suggestions is made in a text

Access paths:
Click the hyperlink in Education Network Forums (blue dotted arrow shows where the hyperlink is located) to go to required webpage (shown by the red small dotted arrow). Based on the information displayed to integrate a set of suggestions made by Doctor Nauckunaite so as to answer the multiple choice question.

Coding guide:
Full Credit
C. If you can hide the fact that you are afraid, you will feel less afraid.

No Credit
Code 0: Other responses.
Code 9: Missing.

Figure 11: Access structure pertinent to answering E022Q08 (LET’S SPEAK)
3.2.4 Task 4: E022Q09 (LET’S SPEAK)

Look at Mischa's post for March 10. Click on “Write a Reply” and write a reply to Mischa. In your reply, answer her question about which writer, in your opinion, knows the most about this issue. Give a reason for your answer. [Note: use the Back button to refer to the Forum page.]

Click “Post Reply” to add your reply to the forum.

Question intent:
Reflect and evaluate: Reflect on and evaluate the content of a text
Support an opinion about the authoritativeness of a text by combining prior knowledge with information from the text

Access paths:
Click on “Write a Reply” button either at the top or at the bottom on the Educaton Network Forum webpage (i.e. step 1) and write by typing a reply to Mischa (i.e. step 2). Then click on “Post Reply” to post the answer (i.e. step 3). The answer can be edited by clicking “Edit Reply” button either at the top or at the bottom on the webpage (i.e step 4). (n.b. Blue dotted arrow shows where to start doing the tasks, and red dotted arrows in sequence indicate the planned access structure of the linked webpage)
Coding guide:

Full Credit

Code 1: Identifies Doctor Nauckunaite and/or Psychologist O.L. (explicitly or implicitly) AND refers to their professional status. May express scepticism about their professional status.

- The two professionals are the ones knowing the most, but only Dr. N gives advice on how to work with the problem.
- Psychologist O.L. or Dr. Nauckunaite because they are both trained in the area.
- Doctor Nauckunaite. This is the only one that has the support of a university behind it.
- Dr Nauckunaite, because she’s from a university.
- A university professor has the most practical experience in talking in public.
- Mark has looked into it and found an article written by a person who knows what to do. This man is obviously a professional on the matter, so I think you should follow his advice.
- I’d take most notice of the one who wrote the book, because she has published a book on this subject.
- Psychologist O.L. sounds authoritative, but of course you can’t really know that she is a psychologist.
- You should follow Psychologist O.L.’s advice, as not only he is an experienced psychologist but answers all the questions concerning public speaking accurately, and is very believable.
- Psychologist O.L. because he’s a trained psychologist.
- The person that probably knows most about this is the Doctor. He has had most experience (or at least more than Julie or Tobias) and I think he is therefore more trustworthy.

Identifies any of the four writers named by Mischa (Julie, Tobias, Psych OL or Dr. Nauckunaite) AND gives a reason that is consistent with the text, related to the cogency, practicality or logic of the text.

- Psychologist O.L. because what he says makes sense in terms of the way you see small children and teenagers behave.
- Tobias because he’s actually done it.
- Doctor Nauckunaite because she has set out her ideas in a practical way.
- I think Tobias has the greatest idea of what he’s talking about. He gives you concrete ways in which to improve your public speaking, and if you follow what he says I’m sure you’ll do fine! :)\n- Probably go with Mark’s link, it has the most useful hint about how to overcome fear of public speaking. [“Mark’s link” implies Dr N.]
- I think that Tobias is right. It does help to rehearse and know your topic well. I also agree with Julie to an extent, because some people are more outgoing than others. But with preparation and a good attitude you can make a good speech. Avoiding it altogether is not a solution!!
- Julie’s ideas describe the way people differ, so she is the one I’d believe.

No Credit

Code 0: Names any of the writers without explanation.

- Psychologist O.L.
- Doctor Nauckunaite.

Gives insufficient or vague answer.

- Tobias because I agree with him.
- Doctor Nauckunaite because she is the best.
- Tobias because his ideas make sense.
Shows inaccurate comprehension of the material or gives an implausible or irrelevant answer.

- Psychologist O.L. because he’s my favourite.
- Tobias because he tells you how to avoid public speaking. [inaccurate comprehension]
- I’d go for Mark. [not one of the four writers named by Mischa]

Code 9: Missing.

**Figure 12:** Access structure pertinent to answering E022Q09 (LET’S SPEAK)
Chapter 4
Summary

4.1 Task characteristics of the released test units

In accordance with the ERA Framework, the task characteristics of the two ERA test units released to the public are summarized in Table 6 below.

Table 6: Task characteristics of two ERA test units (PHISHING and LET’S SPEAK)

<table>
<thead>
<tr>
<th>ERA Test Unit</th>
<th>Task</th>
<th>Situation</th>
<th>Reading Aspect</th>
<th>Item Format</th>
<th>Response Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>E010: PHISHING</td>
<td>E010Q02</td>
<td>Public</td>
<td>Retrieve information</td>
<td>Multiple</td>
<td>MC</td>
</tr>
<tr>
<td></td>
<td>E010Q01</td>
<td></td>
<td>Retrieve information</td>
<td></td>
<td>MC</td>
</tr>
<tr>
<td></td>
<td>E010Q04</td>
<td></td>
<td>Retrieve information</td>
<td></td>
<td>MC</td>
</tr>
<tr>
<td>E022: LET’S SPEAK</td>
<td>E022Q01</td>
<td>Public</td>
<td>Develop an interpretation</td>
<td>Multiple</td>
<td>MC</td>
</tr>
<tr>
<td></td>
<td>E022Q04</td>
<td></td>
<td>Develop an interpretation</td>
<td></td>
<td>MC</td>
</tr>
<tr>
<td></td>
<td>E022Q08</td>
<td></td>
<td>Develop an interpretation</td>
<td></td>
<td>MC</td>
</tr>
<tr>
<td></td>
<td>E022Q09</td>
<td></td>
<td>Reflect on and evaluate the content of a text</td>
<td>Open_CR</td>
<td></td>
</tr>
</tbody>
</table>

Note: MC= multiple choice; Open_CR= Open Constructed Response
4.2 Examination of the released test units based on Macao’s field trial results

Using the two released ERA test units for illustration, one can see that implicit in each task of the test unit is an access structure envisaged by the test developer pertinent to answering the task correctly (see Section 3.1 for the access structure and coding guide and Appendix 1-10 for details of the webpage of the test units). There is a need to examine in greater details the two main kinds of item format, i.e. multiple choice (e.g. E010Q02) and open constructed response (e.g. E022Q09) so as to understand issues pertaining to assessment generation of ERA student responses.

E010Q02 (PHISHING) requires students to retrieve information by locating an important component of an explicitly stated definition. This task is of the multiple choice format and the preferable access structure is quite straightforward, i.e. based on the information shown on the webpage Online Phishing Resource Site to retrieve the correct answer. There is no need to click to another webpage.

Table 7 shows that E010Q02, compared with Macao’s international counterparts, has unexpectedly high item facility. Detailed analyses revealed that this task is a dodgy item identified as having positive country differential item functioning. It is good that this task is excluded in the Main Survey 2009.

<table>
<thead>
<tr>
<th>Country</th>
<th>Language</th>
<th>Task ID</th>
<th>Maximum Score</th>
<th>Valid N</th>
<th>Score=0 (%)</th>
<th>Score=1 (%)</th>
<th>Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macao</td>
<td>Chinese</td>
<td>E010Q02#</td>
<td>1</td>
<td>94</td>
<td>19</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td>International*</td>
<td>All languages</td>
<td>E010Q02</td>
<td>1</td>
<td>1702</td>
<td>35</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Macao</td>
<td>Chinese</td>
<td>E010Q01</td>
<td>1</td>
<td>93</td>
<td>30</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>International*</td>
<td>All languages</td>
<td>E010Q01</td>
<td>1</td>
<td>1668</td>
<td>27</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Macao</td>
<td>Chinese</td>
<td>E010Q04#</td>
<td>1</td>
<td>92</td>
<td>25</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>International*</td>
<td>All languages</td>
<td>E010Q04</td>
<td>1</td>
<td>1655</td>
<td>41</td>
<td>59</td>
<td>59</td>
</tr>
</tbody>
</table>

* Based on international data from Austria, Belgium, Canada, Colombia, Germany, Denmark, France, Hong Kong-China, Hungary, Iceland, Ireland, Japan, Korea, Macao-China, Norway, Poland, Spain, and Sweden.
# Tasks identified as having positive country differential item functioning for Macao’s 15-year-old students in Field Trial 2009.

E022Q09 (LET’S SPEAK) requires students to support an opinion about the Authoritativeness of a text by combining prior knowledge with information from the text. This task is of the open constructed response format. Examinees need to reflect on and evaluate the content of a text, and the access structure is less straightforward. There are at least three steps in order to secure an answer. First, examinees need to click on “Write a Reply” button either at the top or at the bottom on the Education Network Forum webpage (i.e. step 1). Second, they need to write by typing a reply to Mischa (i.e. step 2). Third, they should click on “Post Reply” to post the answer (i.e. step 3), and if necessary to edit the answer by clicking “Edit Reply” button either at the top or at the bottom on the webpage (i.e. step 4).
Table 8 shows that E022Q09, compared with Macao’s international counterparts, has unexpectedly low item facility. Detailed analyses revealed that this task is a dodgy item identified as having negative country differential item functioning. It is good that this task is excluded in the Main Survey 2009.

### Table 8: Item statistics of ERA test unit LET’S SPEAK (4 tasks)

<table>
<thead>
<tr>
<th>Country</th>
<th>Language</th>
<th>Task ID</th>
<th>Maximum score</th>
<th>Valid N</th>
<th>Score=0 (%)</th>
<th>Score=1 (%)</th>
<th>Score=2 (%)</th>
<th>Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macao</td>
<td>Chinese</td>
<td>E022Q01</td>
<td>1</td>
<td>118</td>
<td>59</td>
<td>41</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td>International*</td>
<td>All languages</td>
<td>E022Q01</td>
<td>1</td>
<td>1874</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>Macao</td>
<td>Chinese</td>
<td>E022Q04</td>
<td>1</td>
<td>113</td>
<td>44</td>
<td>56</td>
<td>0</td>
<td>56</td>
</tr>
<tr>
<td>International*</td>
<td>All languages</td>
<td>E022Q04</td>
<td>1</td>
<td>1856</td>
<td>53</td>
<td>47</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td>Macao</td>
<td>Chinese</td>
<td>E022Q08#</td>
<td>1</td>
<td>110</td>
<td>86</td>
<td>14</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>International*</td>
<td>All languages</td>
<td>E022Q08</td>
<td>1</td>
<td>1834</td>
<td>73</td>
<td>27</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Macao</td>
<td>Chinese</td>
<td>E022Q09#</td>
<td>2</td>
<td>105</td>
<td>75</td>
<td>19</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>International*</td>
<td>All languages</td>
<td>E022Q09</td>
<td>2</td>
<td>1803</td>
<td>58</td>
<td>25</td>
<td>17</td>
<td>30</td>
</tr>
</tbody>
</table>

* Based on international data from Austria, Belgium, Canada, Colombia, Germany, Denmark, France, Hong Kong-China, Hungary, Iceland, Ireland, Japan, Korea, Macao-China, Norway, Poland, Spain, and Sweden.

** After scaling the ERA student response data using item response theory, the coding guide for E022Q09 has been revised by recoding all scores coded as 2 into 1.

# Tasks identified as having country differential item functioning for Macao’s 15-year-old students in Field Trial 2009.

### 4.3 Preparing for Main Survey 2009 – A friendly reminder

All 15-years-old students studying in secondary schools in Macao will be tested in April and May, 2009 so as to gauge their level of reading literacy, and some students will be sampled simultaneously for electronic reading literacy. While all test units are not curriculum-based, it is still fruitful to help students prepare well for this international assessment. It is reiterated that there is no need to drill students to boost their electronic reading literacy performance in the PISA 2009 Reading Literacy Study. Having said that, it is the authors’ sincere aspiration that the ERA test delivery system, PISA reading assessment framework, reading assessment tasks and the associated coding guides can provide schools a useful point of vantage to help improve students’ online reading literacy at the basic education stage of schooling.
References


Appendix 1: E010P01 (PHISHING)

The Online Phishing Resource Site > Home

What is Phishing?

Phishing is a form of identity theft. Its purpose is to trick people into handing over their personal information. People who collect this information may then use it for illegal activities such as stealing money from a bank account. A phishing e-mail is an e-mail that imitates a well-known company, or claims to offer a genuine service, and asks the recipient to provide personal information. An example is an e-mail that pretends to be from a bank, and asks the recipient for login details such as a username and password. A common technique is to request urgent action to ensure that an account remains valid.

Phishing is not always easy to identify, because many phishing e-mails look genuine.

Is Phishing a Real Problem?

As access to the Internet and the use of e-mail have spread, so has phishing.

Phishing Facts

Average loss to each person who is a victim of successful phishing: US$1,200
Phishing e-mails sent world-wide each month: over 6 billion
Unique (separately identifiable) phishing attacks in a typical month: about 25,000
Peak number of phishing websites operating in any one month: 55,000
Appendix 2: E010P02 (PHISHING)

The Online Phishing Resource Site > Recognising Phishing

What is phishing?
Phishing is a form of identity theft. Its purpose is to trick people into handing over their personal information. People who collect this information may then use it for illegal activities such as stealing money from a bank account or gaining access to sensitive information. An example is an email that pretends to be from a genuine company and asks the recipient to provide personal details such as a username and password. A common technique is to request urgent action to ensure that an account remains valid.

Phishing is not always easy to detect, because many phishing emails look genuine.

Some Typical Features of Phishing Emails

1. Random Email Address
2. E-Mail Greeting (Dear [Name])
3. Requests for Personal Information
4. Links to an E-Mail Website

Electronic Reading Assessment Test Delivery System and Released Tasks
Appendix 3: E010P02A (PHISHING)
Appendix 4: E010P02B (PHISHING)

Phishing is a form of identity theft. Its purpose is to trick people into handing over their personal information, such as their credit card numbers, passwords, and other financial details. Phishing can occur through email, websites, or social media.

Some Typical Features of Phishing E-mails

1. Sender’s E-mail Address (faked)
2. Email Greeting (faked)
3. Requests for Personal Information (faked)
4. Links in an E-mail (faked)

Phishing is not always easy to identify, because many phishing emails look authentic. However, there are several techniques that can help you identify phishing emails that are not genuine.

To verify your email address and access your bank account, log on to the bank's website and enter your email and password.
Appendix 5: E010P02C (PHISHING)

**The Online Phishing Resource Site > Recognising Phishing**

**What is Phishing?**
Phishing is a form of identity theft. Its purpose is to trick people into handing over their personal information, or to install software on their computers. Phishing typically uses email and websites to communicate false information. A phishing attack might include emails that appear to be from trusted organizations or people. The emails may include fake websites that try to get you to enter your personal information, such as your account details or password. Phishing is not always easy to detect, because they may appear genuine.

**Some Typical Features of Phishing Emails**
1. Email address or sender name may look fake.
2. Email may ask for personal information, such as your credit card details or password.
3. Link in the email may take you to a fake website.
4. Link in an Email of or thing.

**Sample Phishing Email**

Subject: Important Update from your Internet Banking Account

Dear [Name],

This is a very important message regarding your Internet Banking Account.

We have noticed recent activity on your account and would like to verify your identity.

Please follow the steps below to verify your account:

1. Click on the link below to update your account details.
2. Enter your current password.
3. Follow the instructions to complete the verification process.

You may receive this email periodically to ensure the security of your account.

Thank you for your cooperation.

[Account Verification Link]

The verification process is necessary to protect your account from unauthorized access. If you receive this message and are unsure, please contact your Internet Banking Account Manager.

If you believe this is a phishing attempt, please report it immediately.

Best Regards,
[Bank Name]
Appendix 6: E010P02D (PHISHING)
Appendix 7: E022P01 (LET’S SPEAK)

This webpage is rather long needed to be scrolled by the examinee to view all the posts. For ease of reference, this webpage has been separated into two, one on this page and another on the following page, so that all posts are legible at one glance.

<table>
<thead>
<tr>
<th>Username</th>
<th>Date</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misha</td>
<td>March 10 15:32</td>
<td>Thanks to everyone who contributed, and for Mark's link to Dr. N. The only thing is, now I'm confused about what to believe. Julie, Tobias, Psych OL, and Dr. Naudin take all said different things. Which one of those four people really knows the most about this issue?</td>
</tr>
<tr>
<td>Julie</td>
<td>March 7 10:14</td>
<td>I think that the ability to speak in public depends on each person's personality. Some people seem completely incapable of public speaking. When they have to do it, their hands shake and their voices tremble. Others, on the other hand, can discuss a subject fluently, in a way that makes the topic interesting for the audience. These people seem to be able to perform brilliantly, even if they have not had time to prepare! I'd say, there's no point in trying to change what you are.</td>
</tr>
<tr>
<td>Psychologist OL</td>
<td>February 20 22:51</td>
<td>Our attitude to speaking in public depends a lot on our age. The easiest age at which to speak in public is when we are three years old. At this time, we naturally talk incessantly, using words newly coined words of our own. We create and experiment with languages, not caring about vocabulary. The emotional part of speech is also very fluent — no-one laughs, cries, or shows despair so expressively as a kindergartner. Why are we so bold at that age? It is because we do not judge ourselves, we do not reflect upon ourselves and we do not have the baggage of painful experience. It is when we go to high school that we suddenly find that we are incapable of speaking, when called up to speak in front of the whole class.</td>
</tr>
<tr>
<td>User</td>
<td>Date/Time</td>
<td>Comment</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Andrew</td>
<td>February 3rd 21:07</td>
<td>I am a normal person. I do not suffer from any physiological or psychological problems. So why is it that the second I have to speak in public, my heart starts fluttering and sinks into my boots? Of course I try to pull myself together, but it does not work very well. I am afraid that if I do not face and conquer this problem, it will stay with me for the rest of my life.</td>
</tr>
<tr>
<td>Mark</td>
<td>January 28th 13:39</td>
<td>Yes, I agree with everything you say. You can’t avoid it. I found a helpful online article by a Doctor Guadukuma. Take a look.</td>
</tr>
</tbody>
</table>
Appendix 8: E022P02 (LET’S SPEAK)
Appendix 9: E022P03 (LET’S SPEAK)

This webpage is rather long needed to be scrolled by the examinee to view all the posts. For ease of reference, this webpage has been separated into two, one on this page and another on the following page, so that all posts are legible at one glance.

<table>
<thead>
<tr>
<th>Student</th>
<th>Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don</td>
<td>Write your reply here...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mischa</th>
<th>March 10 15:32</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thanks to everyone who contributed, and for Mark’s link to Dr. H. The only thing I’m confused about is what to believe. Julie, Tobias, Psych 210, and Dr. Naudiwala all had different things. Which one of these four people really knows the most about this issue?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Julie</th>
<th>March 7 18:14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I think that the ability to speak in public depends on each person’s personality. Some people seem completely incapable of public speaking. When they have to do it, their hands shake and their voice trembles. Others, on the other hand, can discuss a subject fluently, in a way that makes the topic interesting for the audience. These people seem to be able to perform brilliantly, even if they have not had time to prepare! I’d say, there’s no point in trying to change what you are.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Psychologist</th>
<th>February 20 22:51</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Our attitude to speaking in public depends a lot on our age. The easiest age at which to speak in public is when we are three years old. At this time we naturally talk incessantly, using various newly coined words of our own. We create and experiment with language, not caring about vocabulary. The emotional part of speech is also very fixed – normative limits, crying or shouts depend on expressiveness and a kinder partner. Why are we so bold at that age? It’s because we do not judge ourselves, we do not reflect upon ourselves and we do not have the baggage of painful experience. It is when we go to high school that we suddenly find that we are incapable of speaking, when called upon to speak in front of the whole class.</td>
</tr>
<tr>
<td>Name</td>
<td>Date</td>
</tr>
<tr>
<td>--------</td>
<td>------------</td>
</tr>
<tr>
<td>Andrew</td>
<td>February 3 21:07</td>
</tr>
<tr>
<td>Mark</td>
<td>January 20 13:20</td>
</tr>
<tr>
<td>Lauren</td>
<td>January 27 13:12</td>
</tr>
<tr>
<td>Tobias</td>
<td>January 15 16:40</td>
</tr>
<tr>
<td>Misha</td>
<td>January 15 15:32</td>
</tr>
</tbody>
</table>
Appendix 10: E022P04 (LET’S SPEAK)

Dr. Zita Nauckumiute

**Tips on Public Speaking**

It is natural to be nervous when you have to give a speech. Concentrate. Try not to think about how you appear to others or how nervous you are, but only about the subject of your speech.

People become most nervous when they feel that others can see their lack of confidence. Knowing how to conceal your sense of fear diminishes the fear itself.

Since people are most nervous at the beginning of the speech, one practical way to overcome fear is to learn the beginning of your speech by heart. Before commencing the speech, look around at your audience. If you know exactly who it is you are speaking to, you will feel more at ease.

If you are feeling overcome by fear during your speech, try not to look at a particular audience member. Instead, direct your gaze toward the middle of the audience as a whole. When you use that technique, both those sitting in front and those towards the back of the audience will feel that you are, in fact, looking at them. Enunciate each word clearly. Nothing will soothe you more than your own voice sounding clear, and in control.

Extract from
*Teaching of Oratory*, by Dr. Z. Nauckumiute, Faculty of Philology, Vilnius Pedagogical University, Lithuania.