

PIRLS 2011 Web-based Reading Initiative

Increasing numbers of students are using the Internet as their primary information source for schoolwork and social activities. In addition to the prevalence of Internet-based reading, there continues to be rapid growth in the use of portable reading devices, such as e-readers and tablet computers. To address students' burgeoning use of electronic texts, a number of countries whose students routinely used computer-based reading expressed strong interest in expanding the PIRLS 2011 assessment program to include a web-based reading component. Interested countries were optimistic about obtaining funding¹ for this PIRLS expansion.

To begin work on the web-based reading initiative, the *PIRLS 2011 Assessment Framework* was expanded to encompass electronic text types, such as hypertext used in websites. In addition, the TIMSS & PIRLS International Study Center convened a working group of representatives from interested countries to design the web-based reading assessment and identify major issues for consideration. Based on the working group's ideas, the TIMSS & PIRLS International Study Center developed a plan for a web-based reading initiative in PIRLS 2011.

The PIRLS 2011 Web-based Reading Initiative

Students participating in the web-based reading component of PIRLS would be presented with web-based text via computer but would answer the associated comprehension questions (items) in an accompanying booklet. In other words, students would read and navigate the text(s) on screen, while using the normal PIRLS approach of reading the questions about the text(s) and providing their answers in a printed (paper) booklet. This approach reflects the typical web-based reading experiences of fourth grade students. That is, students often obtain information from the Web to complete various types of assignments. Having the students answer in printed booklets also provided consistency with the rest of the PIRLS assessment in how item responses would be collected.

A subsample of students within classrooms participating in PIRLS would complete the web-based reading assessment in addition to the paper-based PIRLS assessment, and would be asked to complete a short questionnaire about reading on the computer.

Finally, a delivery system would be developed to present the web-based texts to students in an authentic manner while allowing for translation across countries and maintaining the security necessary for PIRLS.

¹ The participation fee for the web-based reading initiative was USD 50,000 plus EURO 50,000.

Developing the Web-based Texts and Reading Comprehension Items

The PIRLS 2011 web-based initiative was to consist of two blocks that would assess informational reading. One block would be based on an existing non-linear PIRLS informational text that appears similar to information found on the Web. Presenting this text in both the existing paper format and a web format would allow researchers to compare students' abilities to gather information from a paper-based text versus a web-based text. A second web-based assessment block would be developed based on an actual website. The idea was to develop a web-based task that would mirror students' informational reading experiences for school.

As described above, one of the web-based texts developed for PIRLS 2011 was based on an existing PIRLS informational text. The web-based version of this PIRLS text was designed to represent the paper-based reading experience on a computer screen with text and images appearing in an equivalent form to those on paper with the addition of simple button- and icon-based navigation tools to allow students to read the different "pages" of the text. The comprehension items for the web-based version of this text were the same as for the paper-based version to allow for comparisons across the two versions of the assessment block.

In order to ensure a second assessment block based on an authentic website, the plan was to develop and field-test two blocks based on authentic websites. The process of selecting appropriate websites for PIRLS 2011 proved to be quite challenging. In addition to the literary features sought in all PIRLS texts, it was important that the web-based texts capitalize on common website features such as hyperlinks within text and interactive supporting graphics and that they came from noncommercial websites. It became apparent that very few websites had content that met all of the criteria.

Because identifying appropriate web-based texts for PIRLS 2011 proved to be such a challenge, Julian Fraillon from the Australian Council for Educational Research, joined the project as the PIRLS Web-based Reading Coordinator.

After significant effort, one web-based text was identified for further development. Once the new web-based text was identified, the content was reviewed and edited to create a modified website that had a hyperlink structure and amount of text that was appropriate for an assessment context. As part of this process, graphics specialists at the TIMSS & PIRLS International Study Center designed prototype web pages that demonstrated the structure of the web-based text. Designing these prototype web pages was an iterative process, as the text content and hyperlink structure were reviewed and refined by the TIMSS & PIRLS International Study Center, National Research Coordinators, and Reading Development Group.

After the structure of the new web-based text was established, the PIRLS 2011 Task Force wrote a total of 19 comprehension items to assess the comprehension processes across the text. Scoring guides also were drafted with criteria and examples for awarding score points to student responses to constructed-response items. These comprehension items and scoring guides were subsequently reviewed and revised by the PIRLS 2011 Reading Development Group alongside the PIRLS 2011 paper-based items.

Preparing a Delivery System for the Web-based Reading Assessment

Running parallel to the content development of the web-based reading blocks, staff at the IEA Data Processing and Research Center (DPC) explored options for a web-based delivery system for the assessment. The delivery system needed to satisfy a number of criteria to ensure success in the context of a large-scale international

assessment. The platform needed to be able to deliver the passages on a broad range of computers (across schools in countries) and be compatible with a translation system that could be used to create versions of the passages in the testing languages of participating countries. The platform also needed to function without the use of a web browser to ensure security and operational standardization. Most importantly, the delivery system needed to present the material in a manner that was aesthetically engaging to students, as though it were an authentic website.

IEA DPC staff worked with the Web-based Reading Coordinator to develop and test a prototype delivery system for test administration. This development work was crucial to understanding the technical challenges involved in implementing such a system. A substantial amount of time was spent designing the login features for test administrators and students, which would ensure the assignment of the correct web-based text to participating students, and exploring features to safeguard the delivery system against anticipated computer errors during the test administration.

Considerable effort also was directed toward maintaining the authentic presentation and quality of the web-based texts while addressing the technical specifications necessary for the platform to be compatible across a wide range of computer systems. It is particularly challenging, yet crucial, to develop a delivery system that meets the criteria necessary for an international assessment while supporting a sophisticated website presentation that is highly interactive, graphically appealing, and engaging to students.

Unfortunately, the development work for the PIRLS 2011 web-based reading initiative was not completed due to a lack of funding. Despite the original optimism, neither IEA nor the countries interested in participating in the web-based reading assessment were able to secure funding. After two years of sustained effort during which considerable resources were expended, IEA and the TIMSS & PIRLS International Study Center at Boston College had to suspend development. Although two web-based blocks had been developed when work was suspended, development had not yet begun on the second field test block based on an authentic website. Also, to become operational, the delivery system required much further development and extensive testing.

Looking Ahead to a Web-based Reading Assessment in PIRLS 2016

The work done for PIRLS 2011 was a significant step in the development of a web-based reading component for PIRLS. It helped to expose the challenges associated with introducing a web-based reading component into the PIRLS assessment, and made strides towards finding solutions to these challenges for future PIRLS assessments. Although finding appropriate websites and developing a web-based assessment delivery system would require substantial resources, the two web-based assessment blocks developed as part of PIRLS 2011 puts IEA in an excellent position to expand the assessment for PIRLS 2016 to include a web-based reading component.