Who Clicks On Advertisements During an Online Reading Assessment? An Analysis of ePIRLS 2016 Process Data

# Introduction

Students around the world are having increased access to and consumption of online information both in and out of school. While online reading provides new opportunities compared with offline reading, it also presents challenges for readers, including the potential for distractions (Goldstein et al., 2014). It is believed that students working on a school assignment or research project are expected to finish sooner if they focus on finding critical information and are not distracted (Mullis et al., 2017).

Given the increasing prevalence and importance of online reading, the international assessment ePIRLS was first administered in 2016 to measure how well fourth-grade students read, interpret, and critique the information online. As a digitally-based assessment, ePIRLS collects data on students’ test taking process, which could provide insights on the relationship between students’ performance and their testing behaviors. However, research is limited on this relationship using data from international large-scale assessments in general, or from ePIRLS in specific. This study aims at contributing to the literature by exploring the process data in ePIRLS to understand how students read and behave when presented with the distraction of online advertisements.

# Data and Methods

This study analyzes data from 16 education systems whose 4th-grade students participated in ePIRLS 2016, an innovative assessment of online reading. The ePIRLS assessment consists of five modules of science and social studies topics (“Mars”, “Rainforests”, “Dr. Elizabeth Blackwell”, “Zebra and Wildebeest Migration”, and “The Legend of Troy”) with each module lasting up to 40 minutes. Each student was randomly assigned to complete two of the modules. Each module contained advertisements, which resemble the real-life web-browsing experience. Information is recorded by ePIRLS on how many times students clicked on advertisements in each module, and is used for the analyses conducted in this study. All analyses account for the complex survey design of the ePIRLS study and use all five plausible values of achievement.

# Results Synopsis

**RQ1: What are students’ ad click patterns for each of the 5 modules?**

For each module, students clicked on advertisements as few as zero times and as many as 604 times (one student in Chinese Taipei clicked on ads 604 times in the “Rainforests” module). The median per-student and per-module ad clicks was zero across all education systems, and the average per-student ad clicks in each module ranged from 0.1 (in the “The Legend of Troy” module in Sweden) to 2.4 (in the “Rainforests” module in Chinese Taipei).

The percentage of students who clicked on advertisements in each module ranged from 2.5 percent in Sweden in the “Zebra and Wildebeest Migration” module to 20.0 percent in Abu Dhabi in the “Mars” module.

In 13 out of the 16 participating education systems, the advertisements in the “Mars” module attracted a higher percentage of students to click compared to other modules. Differential ad-click patterns across modules may be attributed to how relevant the ads are to the reading theme of each module. As seen from the two released modules, the “Mars” module advertisements are about "trips to the stars” or “having a star named after you or your friend”, which are highly relevant to the space theme of the module, while the ads in the “Dr. Elizabeth Blackwell” module are about “unlimited free calls” or “low interest loans”, which are less relevant to the biography theme of the module.

**RQ2: What percentage of students clicked on advertisements at least once in the assessment?**

The percentage of students who clicked on at least one advertisements during the assessment ranged from 6.7 percent in Sweden to 27.7 percent in Chinese Taipei. In the United States, 13.1 percent of the students clicked on ads in the assessment.

Among students who clicked on ads, boys make up from 57.0 percent (Slovenia) to 67.8 percent (Abu Dhabi) in each education system, which are all statistically significantly higher than the percentage of girls in the corresponding education system. Among students who did not click on any ads, however, there are no measurable percentage difference between gender in most education systems, except for 4 education systems where lower percentages of boys (from 46.2 percent to 47.7 percent) than girls did not click on advertisements.

**RQ3: How are students’ ad click patterns associated with their online reading achievement?**

Across all participating education systems, on average, students who clicked on ads scored 537.5 points on the ePIRLS assessment, while students who did not click on ads scored 502.1 points. As a point of reference, the centerpoint of the ePIRLS scale is 500 points.

In all participating education systems, students who clicked on ads score statistically significantly lower than their peers who did not click on ads, except in Singapore where the gap is not statistically significantly different from zero. The gap favoring non-ad-clicking students ranged from 11.4 points in Norway to 89.7 in Abu Dhabi. In the United States, the achievement gap is 20.5 points favoring students who did not click on ads.

**RQ4: How are students’ ad click patterns associated with time spent completing the assessment?**

In 13 of the 16 participating education systems, there is no measurable difference in the time spent in the ePIRLS assessment (from start to log out) between students who clicked on ads and those who did not do so. In Italy, students who clicked on ads spent, on average2.8 more minutes in the assessment than their peers who did not click on ads. However, in the United Arab Emirates and Abu Dhabi, students who clicked on ads spent, on average, 3.1 and 4.5 fewer minutes, respectively, than their peers who clicked on ads. This finding does not provide support to the hypothesis that students who are distracted tend to spend more time in finishing the assessment.

# Conclusions

Using process data in ePIRLS 2016, this study reveals that in most education systems, students who clicked on advertisements spent the same amount of time completing the assessment but tended to score lower than their peers who did not click on ads. Also, the results indicate that higher proportions of boys than girls clicked on advertisements during the assessment time. Using process data, future studies could explore more insights on students’ reading and testing behaviors, including other factors that may be associated with students’ ad-click patterns.

# References

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