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# Berkshire Wireless Learning Initiative Final Evaluation Report

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## Results

### Student Drawing Results: Summary over Time

Across the three years of program implementation, over 3,500 student drawings were collected and analyzed from BWLI students. In each case, students were asked to:

Think about the work you do in your classroom.

In the space below, draw a picture of yourself writing in school.

Specifically, baseline (pre-1:1) drawings were collected from 7th grade students beginning in December 2005 before student laptops were deployed. Students across all grade levels were subsequently surveyed in June 2006, June 2007, and finally in June 2008.

Each student drawing was analyzed, coded and entered into a database by the research team. Given the multiple data collection points over the course of the student laptop deployment schedule, there are numerous ways to summarize the collection of student drawings. Table SD1 provides a summary of students drawing data over time by examining 7th grade student drawing characteristics from December 2005 (pre-laptop) to June 2008 across each BWLI school.

**Table SD1: Summary of BWLI 7<sup>th</sup> grade student drawing characteristics across schools from December 2005 (pre-laptop) to June 2008**

|                                | Conte |      |      | Herberg |      |      | Reid  |      |      | St. Mark |      |      | All BWLI Schools |      |      |
|--------------------------------|-------|------|------|---------|------|------|-------|------|------|----------|------|------|------------------|------|------|
|                                | 12/05 | 6/06 | 6/08 | 12/05   | 6/06 | 6/08 | 12/05 | 6/06 | 6/08 | 12/05    | 6/06 | 6/08 | 12/05            | 6/06 | 6/08 |
| N (# responding students)      | 123   | 119  | 82   | 219     | 213  | 179  | 174   | 161  | 165  | 61       | 61   | 90   | 577              | 554  | 517  |
| <b>Student Characteristics</b> |       |      |      |         |      |      |       |      |      |          |      |      |                  |      |      |
| At desk                        | 80%   | 87%  | 95%  | 92%     | 94%  | 89%  | 91%   | 88%  | 88%  | 95%      | 92%  | 91%  | 89%              | 91%  | 90%  |
| Writing with pencil            | 59%   | 28%  | 93%  | 63%     | 49%  | 53%  | 80%   | 41%  | 70%  | 72%      | 13%  | 39%  | 68%              | 38%  | 62%  |
| Writing with laptop            | 0%    | 12%  | 1%   | 0%      | 5%   | 7%   | 0%    | 13%  | 19%  | 0%       | 34%  | 33%  | 0%               | 12%  | 15%  |
| Writing with desktop computer  | 0%    | 1%   | 1%   | 0%      | 0%   | 0%   | 0%    | 1%   | 1%   | 0%       | 0%   | 3%   | 0%               | 0%   | 1%   |
| Thinking                       | 15%   | 13%  | 12%  | 16%     | 9%   | 13%  | 12%   | 4%   | 15%  | 11%      | 3%   | 20%  | 14%              | 8%   | 15%  |
| Reading                        | 0%    | 0%   | 0%   | 1%      | 0%   | 2%   | 0%    | 0%   | 1%   | 0%       | 0%   | 4%   | 0%               | 0%   | 2%   |
| Talking with teacher           | 2%    | 2%   | 0%   | 0%      | 0%   | 4%   | 2%    | 2%   | 4%   | 3%       | 0%   | 0%   | 1%               | 1%   | 3%   |
| Talking with other student     | 2%    | 0%   | 0%   | 0%      | 0%   | 1%   | 1%    | 1%   | 0%   | 2%       | 0%   | 1%   | 1%               | 0%   | 1%   |
| <b>Technology Present</b>      |       |      |      |         |      |      |       |      |      |          |      |      |                  |      |      |
| Laptop computer                | 0%    | 14%  | 2%   | 1%      | 13%  | 8%   | 1%    | 24%  | 22%  | 2%       | 64%  | 43%  | 1%               | 22%  | 18%  |
| Desktop computer               | 0%    | 2%   | 1%   | 0%      | 0%   | 0%   | 0%    | 1%   | 0%   | 2%       | 0%   | 7%   | 0%               | 1%   | 1%   |
| Paper                          | 71%   | 64%  | 93%  | 80%     | 72%  | 79%  | 91%   | 65%  | 78%  | 69%      | 30%  | 71%  | 80%              | 63%  | 79%  |
| Pencil                         | 67%   | 55%  | 93%  | 81%     | 72%  | 80%  | 87%   | 67%  | 81%  | 80%      | 25%  | 70%  | 80%              | 62%  | 81%  |
| <b>Other</b>                   |       |      |      |         |      |      |       |      |      |          |      |      |                  |      |      |
| Other students present         | 5%    | 8%   | 17%  | 5%      | 5%   | 9%   | 10%   | 5%   | 3%   | 10%      | 3%   | 8%   | 7%               | 5%   | 8%   |
| Teacher present                | 15%   | 11%  | 15%  | 7%      | 4%   | 8%   | 13%   | 9%   | 12%  | 16%      | 3%   | 6%   | 12%              | 7%   | 10%  |
| Classroom decorations          | 8%    | 9%   | 50%  | 6%      | 0%   | 16%  | 5%    | 2%   | 19%  | 3%       | 3%   | 34%  | 6%               | 3%   | 26%  |
| Multi-frame drawing            | 2%    | 0%   | 2%   | 0%      | 0%   | 1%   | 0%    | 0%   | 6%   | 0%       | 0%   | 4%   | 1%               | 0%   | 3%   |
| <b>Student Demeanor</b>        |       |      |      |         |      |      |       |      |      |          |      |      |                  |      |      |
| Positive                       | 51%   | 51%  | 48%  | 60%     | 62%  | 61%  | 53%   | 52%  | 40%  | 51%      | 41%  | 53%  | 55%              | 54%  | 51%  |
| Negative                       | 11%   | 4%   | 1%   | 7%      | 4%   | 16%  | 5%    | 4%   | 12%  | 10%      | 0%   | 8%   | 8%               | 3%   | 11%  |
| Neutral                        | 20%   | 20%  | 32%  | 18%     | 13%  | 16%  | 22%   | 23%  | 30%  | 20%      | 26%  | 7%   | 20%              | 19%  | 21%  |
| Can't Discern                  | 17%   | 24%  | 20%  | 15%     | 22%  | 12%  | 16%   | 20%  | 18%  | 21%      | 31%  | 32%  | 16%              | 23%  | 19%  |

Each cell in Table SD1 provides the percent of drawings where a given characteristic was noted by the coding team. In the December 2005 data collection, 7th grade students had not yet received BWLI laptops. By the June 2006 student drawing data collection, 7th grade students had approximately four months of 1:1 computing experience. Lastly, the June 2008 survey results show the last cohort of BWLI 7th graders participating in the student drawing exercise after 2 years of 1:1 computing experience.

As the results across the BWLI schools show, the greatest difference in the collection of student drawings over time has been the presence of technology. Specifically, the presence of a laptop computer in the drawings went from less than 1% on December, 2005 to 22% six months later. During this same time period the depiction of paper and pencil in the drawing decreased from 80% of all drawings to 62–63%. This transition in how students depicted themselves writing in school was most dramatic at the St. Mark school where only 2% of the December 2005 drawings contained a depiction of a laptop but by June 2006 64% of students drew laptops. Across BWLI schools, the drawings collected from the final cohort of 7th graders in June 2008 show a return to the pre-laptop presence of paper and a decrease to 18% for drawings depicting laptops. This trend was realized in every BWLI setting, but was most dramatic at the Conte school where only 28% of drawings collected in June 2006 depicted students writing with pencil compared to 93% in June 2008.

Although the coded samples of drawings show some differences in student depictions and perceptions over time (notably the shifts in technology presence), individual student drawings allow a more direct window into students' perception and view of themselves and their school. For example, a small number of students took the drawing exercise as an opportunity to provide their feedback and perspective on writing with and without technology in their school. As one example, a female 8th grade student from one of the Pittsfield public schools depicted herself seated alone at her desk with a paper, pencil and dictionary and looking rather unhappy. The text accompanying the student reads "*Im sad because we have to write on paper insted (sic) of doing it on our computers :(*" and "*Its better if we had out laptops because it is easier and faster to look up things*". On the table/desk behind her are two open laptops with the following text: "*Im on Safari researching for examples for how to write a persuasive essay*". Also depicted in the drawing are the teacher's desk, the teacher's computer, and a ClassBoard (interactive whiteboard). There were numerous drawings where students expressly noted their preference for writing with laptops over paper and pencil. Space does not allow for the reproduction of individual student drawings in this report, however an interactive gallery showcasing examples of students unique perspective is available at [www.bc.ed/bwli](http://www.bc.ed/bwli).