



## PRINT AND PAPER PLAY A KEY ROLE IN LEARNING AND LITERACY

New classroom learning methods and tools, including digital technology, are being adopted around the world at an increasingly rapid pace. Interestingly, current research reveals that there are learning and retention limitations to engaging digital technology in the classroom and as a studying tool when compared to pencil and paper.

### The Facts

- Parents and toddlers who read paper books together speak and interact more when compared with those who read e-books.<sup>1</sup>
- Having a wide range of writing skills – from the basic production of letters, shapes and numbers to quality handwriting – has been positively linked to academic performance.<sup>2</sup>
- A meta-study of 54 studies with more than 170,000 participants reveals that readers' comprehension is better when reading from paper vs. screens. The study also found that readers are more likely to be overconfident about their comprehension abilities when reading digitally than when reading in print, in particular under time pressure, leading to more skimming and less concentration on reading matter.<sup>3</sup>
- Fine motor writing skills in preschool were consistently stronger predictors of reading and math achievement than fine motor manipulation tasks.<sup>4</sup>
- Elementary students who write by hand are found to write more quickly, produced longer pieces, and wrote more complete sentences than those who do not, and handwriting strengthens fine motor skills in young students.<sup>5</sup>
- When children composed text by hand, they not only consistently produced more words more quickly than they did on a keyboard, but expressed more ideas. And brain imaging in the oldest subjects suggested that the connection between writing and idea generation went even further. When these children were asked to come up with ideas for a composition, the ones with better handwriting exhibited greater neural activation in areas associated with working memory — and increased overall activation in the reading and writing networks.<sup>6</sup>
- Children remembered more details from stories they read on paper than ones they read in e-books enhanced with interactive animations, videos and games.<sup>7</sup>
- Three studies that compared print and digital comprehension among college students reading newspaper articles and fiction excerpts found that students read digital formats faster — at a cost. Students gleaned the main idea from digital texts as well as they did from print. But they absorbed fewer details, which suggests students are much better off reading print for in-depth, university-level study.<sup>8</sup>

Print and Paper  
have a great  
environmental  
story to tell



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- Despite immense technological advances, learners still prefer studying text from printed hard-copy rather than from computer screens. Quantitative findings from a study of university students in the US., Japan, Germany, Slovakia and India revealed high levels of affirmation about advantages of reading in print. Nearly 92% said they concentrated best when reading in print, and more than 80% reported that if cost were the same, they would prefer print for both school work and pleasure reading. Students reported they were more likely to re-read printed material than digital.<sup>9</sup>
- A large international survey with more than 10,000 participants found that, for academic reading, a broad majority reported a preference for print, especially when reading longer texts. Interestingly, participants reported that they felt they remembered the material better and were better able to focus when reading in print, compared to when reading digitally.<sup>10</sup>
- Laptops are commonplace in university classrooms and one of their drawbacks is that they offer distractions to note taking. Research on the effects of in-class laptop use on student learning showed that multitasking on a laptop poses a significant distraction to both users and fellow students and can be detrimental to comprehension of lecture content.<sup>11</sup>

**Studies that compare the efficiency and effectiveness of print vs. paperless reading typically agree that print has key advantages. Print readers:**

- Read more quickly<sup>12</sup>
- Experience less mental fatigue<sup>13</sup>
- Report significantly lower levels of eye fatigue following reading<sup>14</sup>
- Find it easier to concentrate<sup>15</sup>
- Retain more of what they read<sup>16</sup>
- Score better on reading comprehension tests<sup>17</sup>

- The tangibility of traditional print also provides a stronger emotional impact, allowing readers to interpret and internalize text through their own experiences and beliefs.<sup>18</sup>
- A 2012 survey by the Pew Research Center's Internet & American Life Project of 2,252 people age 16 and older found that 81 percent of parents believe it is "very important" that their child read print books, citing the importance of prints' unique sensory and tactile experience.<sup>19</sup>
- Print text allows readers to mentally map information they read in relation to other information or 'landmarks' (e.g., a chapter, the left or right page, near the top or bottom of the page). Spatial maps have been shown to improve learning, retention and comprehension overall.<sup>20</sup>
- A study of college students at Oxford University found that reading on screen was conducive to a more superficial reading style... attention span and reading sessions were shorter. Students reported that with e-texts they generally read short passages only and usually in a non-linear fashion. They also reported it required more effort to concentrate when reading on screen.<sup>21</sup>

**When it comes to reading books, magazines and newspapers, print is preferred over digital.**

- 68% of Americans and Canadians believe print is the most enjoyable way to read books
- 65% of Americans and 59% of Canadians prefer to read magazines in print
- 53% of Americans and 49% of Canadians prefer to read newspapers in print<sup>22</sup>

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