

# A Case for **COLOR** In Your Curriculum



“ Our school district does not allow color printing. ”

Does this sound like you?



## A Case for Color

According to the National Center for Education Statistics, there are over 129,000 elementary and secondary schools (both public and private) in the United States.<sup>1</sup> Print still plays a vital role in educators' efforts to better serve their students. K-12 schools use printing to support key operational areas such as learning and teaching materials, extra-curricular activities, fundraising and promotional activities, admissions and human resources services, and alumni and community relations activities.

A recent Keypoint Intelligence/InfoTrends survey of the education industry found that K-12 schools produce a variety of printed materials.<sup>2</sup> Specifically, the study found that 50% to 60% of printed work is direct instructional or teaching materials, such as student workbooks, writing journals, practice sheets, and tests; while about 15% to 30% of print jobs are educational support materials. The balance of work produced for the schools by the in-house printing facilities are stationery-type products, such as business cards, letterhead, envelopes and note pads.

<sup>1</sup> Source: U.S. Department of Education, National Center for Education Statistics, Feb 2017; includes 1.2 million public prekindergarten and 5.2 million private school students

<sup>2</sup> Source: In Search of Business Opportunities: Finding the Right Prospects, InfoTrends 2017

Despite the rise of digital learning materials, print remains important. The massive shift from print to digital that many predicted has been slow to materialize. According to research by Simba Information, print accounts for nearly 70% of pre-K-12 instructional material sales in the United States. Some key factors that are keeping print in the classroom are:

- Teachers and students often prefer print.
- Print is frequently more affordable.
- School districts may lack the Internet bandwidth to keep students online.
- Educators are pursuing a hybrid approach that uses electronic and printed content.

Technological advancements with digital inkjet printing provide an opportunity to add value and reduce production costs for schools. RISO ComColor® inkjet digital production devices enable schools to affordably add value to printed products using color, personalization, and in-line bindery capabilities.

# Enhancing Educational Materials with Color Printing

Color printed materials offer many benefits in teaching students—they better capture attention and deliver an enhanced learning experience. Research has consistently shown that color increases memory retention better than verbal or textual cues alone. Other studies have confirmed that color is easier to remember than black and white; most color survey participants reported that they could recall color images more easily than black and white images.

## Improving Retention and Learning

A Color Opinion Research Survey performed in 2011 by Harris Interactive found that 69% of students better understand new ideas when presented in a color format, and that 77% of students say color helps them remember what they read more easily.<sup>3</sup>

In 2002, researchers discovered that subjects performed 5-10% better on standardized pattern recognition tests when they were administered in color rather than black and white.<sup>4</sup> The effect also boosted memory over time.

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While color improves the educational experience for all students, it can be transformational for students with learning disabilities, such as dyslexia or Attention Deficit Hyperactivity Disorder (ADHD).<sup>5</sup> Students with special needs or learning disorders especially benefit from color printing in the classroom. “One of the most common things that we do is provide students with colored overlays in their optimal color – each student has an individualized color that they tend to respond the best to,” explains Dr. Han Ren, a licensed clinical and school psychologist from Austin, Texas specializing in pre-K special education. “The idea is that that this reduces the contrast between the text and the background, and that improves the readability of the text... [It] reduces the eye strain and that, in turn, improves concentration and reading comprehension.”<sup>6</sup> As a result, they are better able to focus on the text and reduce the amount of garbled text that appears.

And students aren't the only ones to benefit. Research with Alzheimer's patients has shown that color cues improve memory and that learners recall images in color more easily than images in black and white.<sup>7</sup>

3 Source: Color Opinion Research Survey 2011 by Harris Interactive

4 Source: Gegenfurtner, Karl. “The Contributions of Color to Recognition Memory for Natural Scenes”, Max-Planck-Institut für Biologische Kybernetik and Justus-Liebig-Universität Giessen, 2002

5 Source: Insight Editor, “The Importance of Color Printing in Education”, Insight, Sep. 20, 2017

6 Source: 2011 Independent color research conducted by Xerox Corporation

7 Source: Rello, Luz/Bigham, Jeffrey. “Good Background Colors for Readers: A Study of People with and without Dyslexia”, Carnegie Mellon University, 2017





## Expanding Engagement

54% of students are more likely to read a document that contains color, states a 2011 independent color research conducted by Xerox Corporation<sup>8</sup>. In fact, a recent Harris Interactive survey from that same year suggests that students not only prefer color to be part of their classroom learning experience, they understand its importance in helping them learn. In fact, as the Harris study points out, 77% of students from grades 3 to 12 enthusiastically agreed that using more color in printed learning materials can help them:

- Focus on what information is important
- Remember key facts and information
- Be more interested in their work<sup>9</sup>

Presenting in color allows the reader to quickly identify key information.

8 Source: 2011 Independent color research conducted by Xerox Corporation.

9 Source: Color Opinion Research Survey 2011 by Harris Interactive.

Many students, teachers, and administrators already support adding more color to classroom materials—but school administrators are reluctant to incorporate color printing because of its traditionally high cost. The good news is that affordable color printing solutions are now available that can enhance the students' learning without jeopardizing the school's budget.

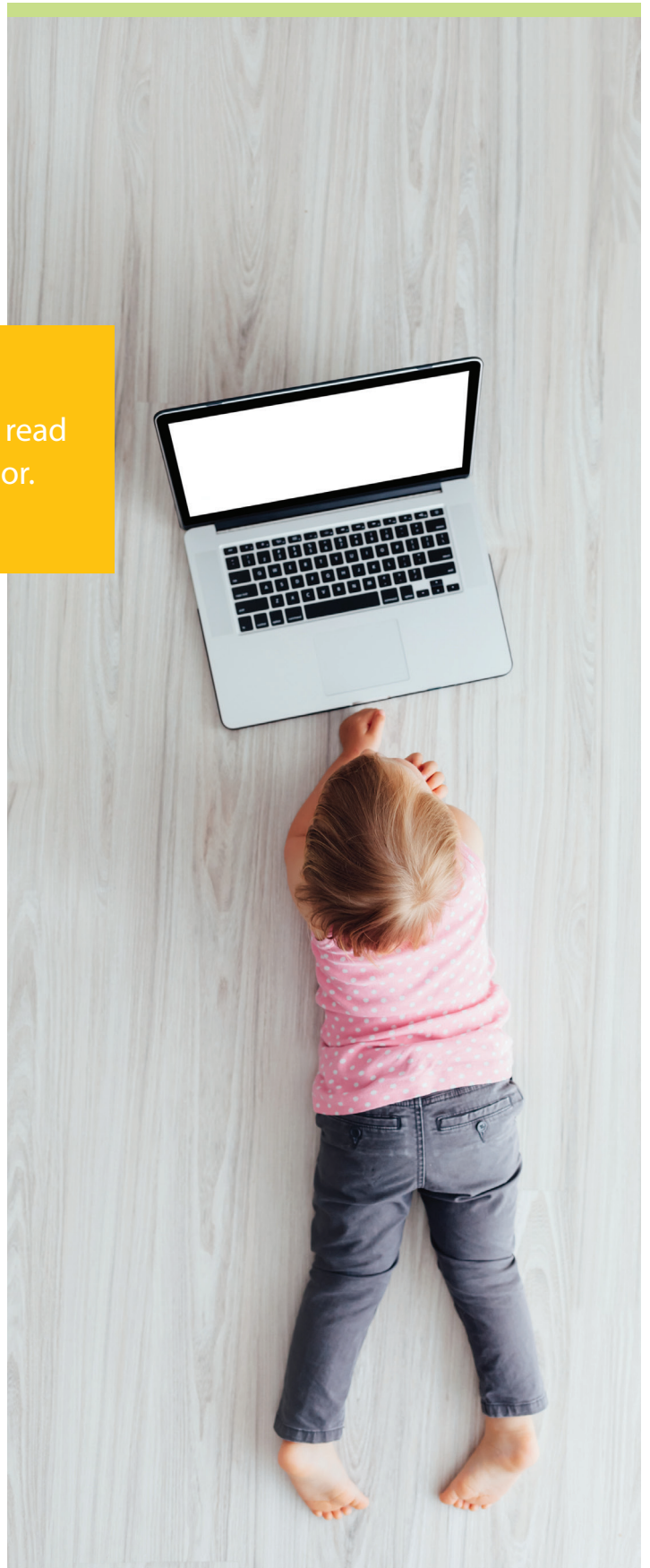
**54%** of students are more likely to read a document that contains color.

Many of today's children are interacting with laptops, iPads, eReaders, and smartphones at an increasingly early age, all of which are rich with full color graphics and content. These "digital natives" find it intuitive to encounter color in the printed materials they receive.

By the time students enter the classroom, color has become a normal part of how they process information. In fact, most children's first encounter with black and white printed information comes on the first day of school. Running into reams of black and white handouts can seem a bit analog and be more difficult to absorb when compared with the interactive media students consume regularly.

But despite the ubiquity of tablets and e-readers, research shows that students read paper more efficiently than content delivered via an electronic device.<sup>10</sup> Kimberly Carraway, a learning specialist reported that linear reading is different from nonlinear reading; when we read text printed on paper, our minds perceive it as "a landscape made up of letters," and this creates mental maps which assist with memory, recall and retention.

<sup>10</sup> Source: Ferlazzo, Larry, "Response: Reading Digitally vs. Reading Paper", Education Week, May 28, 2016





# Color Affects More Than Just Readability



Recent findings from neuroscientists at Harvard Medical School have shown that color is processed not in one, but multiple areas of the brain.<sup>11</sup> From the color center, information travels simultaneously to areas of the brain that are responsible for detecting motion, shapes, edges, and transitions.<sup>12</sup> This happens even with subjects who are color blind. Color can especially help students interpret and understand charts and graphs, and it aids in retention of material covered in class. Using the right color, and the correct selection and placement can seriously affect feelings, attention, and behavior when learning.



Blue stimulates creativity and can help to achieve a state of calm relaxation. Some research suggests that people with highly intellectual work are more productive in a blue environment.



Red stimulates the adrenal glands and can generate feelings of energy. When used in conjunction with repetitive or detail-oriented tasks, red also appears to improve focus and performance.



Yellow in small amounts can make us feel happy.



Green is relaxing and a good color for keeping long-term concentration and clarity. It may even contribute to physical health.



Pink also has a calming influence and has been shown to reduce heart rate.



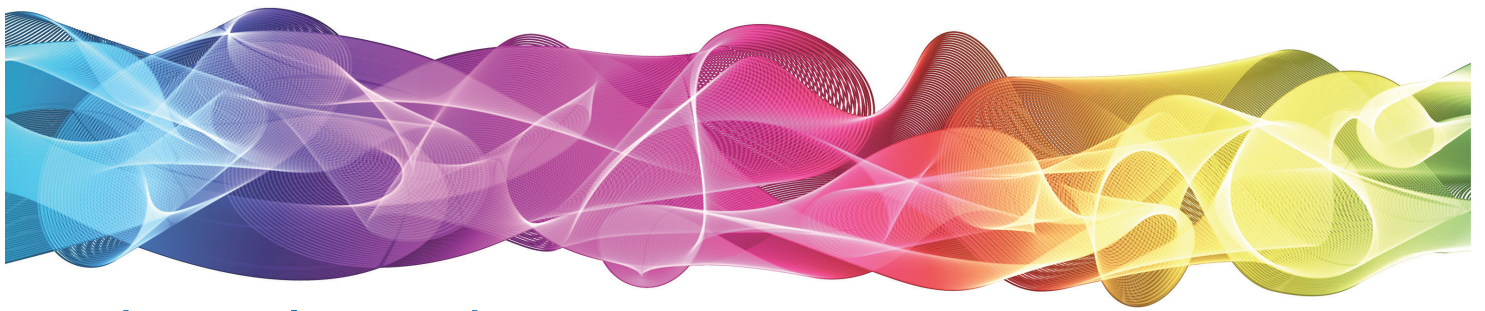
Purple gets our attention.



Orange is a welcoming and mood-lifting color for learners, which in turn promotes comfort and improves neural function. It stimulates critical thinking and memory.

<sup>11</sup> Source: 2011 Independent color research conducted by Xerox Corporation

<sup>12</sup> Source: Blog Admin, "The Psychology of Color: How Do Colors Influence Learning?" Shiftlearning.com blog, Mar. 07, 2019



## Funding Color in Education

Independent color research conducted in 2011 revealed that 85% of decision makers find it easier to get approval for solutions that impact learning. Obviously, color has a tremendous impact on both student learning and engagement, and it's especially valuable for understanding complex topics, maps, data charts and other graphics. An industry white paper notes that visual literacy is now crucial for obtaining information, constructing knowledge and building successful educational outcomes. So, if the facts show that adding color boosts learning, why hasn't this become the norm?

Two main factors have been responsible for the lack of color in the classroom: the cost of printing in color, and the potential for abuse. While color printing has traditionally been far more expensive than black and white, this is no longer the case – and administrators simply need to take another look at the cost-effectiveness of color printing.

Schools are also concerned that color printing may tempt staff and students to print personal documents at the school's expense. New color printing technologies are available that automatically analyze the amount of color used in a document and allow charges based on low, medium, or high color usage, charging for only the amount of color used. Access and cost-control software offer additional capabilities for managing color printing costs and mitigating the potential for abuse.

Likewise, schools can make a more cost-effective investment in high-speed, workgroup-level multifunction printers that are shared among many users, instead of obtaining low-quality printers for every classroom. Networked solutions allow for better budget control, more centralized management of consumables, and fewer operational costs.

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### Low Cost, Affordable Color for Education

The RISO ComColor FW fits very well into this cost-conscious but result-oriented environment. It has the lowest Total Cost of Ownership compared to other similar printers in the market and will help your organization cut costs while maximizing productivity. RISO's FORCEJET™ technology is a heatless imaging process, producing a cool, flat, dry, and colorful output that results in fewer paper jam-related issues. This combined with the environmentally friendly aspect of inkjet technology makes the ComColor FW the perfect choice for education.

# Your RISO Inkjet Color Solution comes in different models to fit your needs.

- 90 pages per minute for a letter/legal color printer
- 120 pages per minute for an 11 x 17 color printer

Accessorize with a scanner or multifunction finisher for folding, stapling, hole punching and booklet making. All in a surprisingly small footprint!



## ENERGY STAR® certified

- Energy efficient, using much less power than toner devices
- Standard 110V powered



## Registered with EPEAT

For the reduction/elimination of environmentally sensitive substances



## Eco-Friendly

- No harmful emissions
- No HVAC/ventilation required



## Heatless Printing

Flat output eliminates paper curl and static electricity for enhanced finishing capabilities



The RISO ComColor FW Inkjet Printer is available for purchase through Sourcewell Awarded Contract # 083116. Sourcewell is the largest government purchasing cooperative in the country, with \$3 billion dollars in annual cooperative purchasing volume. Sourcewell guarantees your school a fair price for your RISO FW by applying a price ceiling to the RISO contract.



Contract # 083116-RSO



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