Publishing for the K-12 school market is an $8 billion industry, with three companies - McGraw-Hill, Pearson, and Houghton Mifflin Harcourt - capturing about 85% of this market. [32] Tablets are a $35 billion industry with roughly one in three adults owning a tablet. [33][34] As tablets have become more prevalent, a new debate has formed over whether K-12 school districts should switch from print textbooks to digital textbooks on tablets and e-readers.

Proponents of tablets say that they are supported by most teachers and students, are much lighter than print textbooks, and improve standardized test scores. They say that tablets can hold hundreds of textbooks, save the environment by lowering the amount of printing, increase student interactivity and creativity, and that digital textbooks are cheaper than print textbooks.

Opponents of tablets say that they are expensive, too distracting for students, easy to break, and costly/time-consuming to fix. They say that tablets contribute to eyestrain, headaches, and blurred vision, increase the excuses available for students not doing their homework, require costly Wi-Fi networks, and become quickly outdated as new technologies are released.

2012 marks the first time that more people accessed the Internet via smartphones and tablets than desktop or laptop computers. [37] By Aug. 2012, 25 percent of US adults owned a tablet computer, 19 percent owned an e-book reader, and 29 percent owned one or the other, according to a survey by the Pew Internet and American Life Project. [18] Analysts estimate that by 2015 more than 33% of the United States will own a

Which is better for these purposes, a printed book or an e-book?

% of those who have read both e-books and printed books in the last 12 months who say that this format is better for these purposes

■ Printed books   ▪ E-books

(Click to enlarge image)

Summary of reader attitudes towards print books and e-books.
Source: Pew Research Center's Internet & American Life Reading Habits Survey, "The Rise of E-Reading," libraries.pewinternet.org, Apr. 4, 2012

tablet. An analysis from JP Morgan Chase estimates that "tablets will evolve into a $35 billion market by 2012, posting 171.8 percent year-over-year growth this year and 66.2 percent in 2013." [38] In 2010 tablets made up 18.9% of all new computer purchases. A joint report by McKinsey and the GSMA predicts the mobile education market could be worth $70 billion globally by 2020, and predicts demand for mobile education devices, like smartphones and tablets, may be worth another $32 billion by the same time frame. [38]

43% of Americans read online books, magazines, or newspapers. [18] Amazon announced in July 2010 that e-books were outselling paper books, and a July 2012 report by the Association of American Publishers showed that e-book revenue exceeded that of hardcover books for the first time ever. [33][34] 80% of publishers now produce e-books. [34] While e-books sales rose 117% from 2010 to 2011, the print book business declined 2.5% in 2011 to $27.2 billion from $27.9 billion in 2010. [33] However, over 90% of educational textbooks are still read on paper, and only 30% of textbook titles are available electronically. [36]

In Nov. 2010, the US Department of Education released its National Education Technology Plan, a detailed blueprint on how schools can improve learning with technology. Among its recommendations is to leverage mobile devices ("the technology students already have") in the classroom. In his Jan. 2011 State of the Union address, President Obama said, "I want all students to be able to learn from digital textbooks." On Feb. 1, 2012, the US Department of Education and the Federal Communications Commission (FCC), in collaboration with several tech organizations, released a downloadable "Digital Textbook Playbook" to "encourage collaboration, accelerate the development of digital textbooks and improve the quality and penetration of digital learning in K-12 public education." [6]
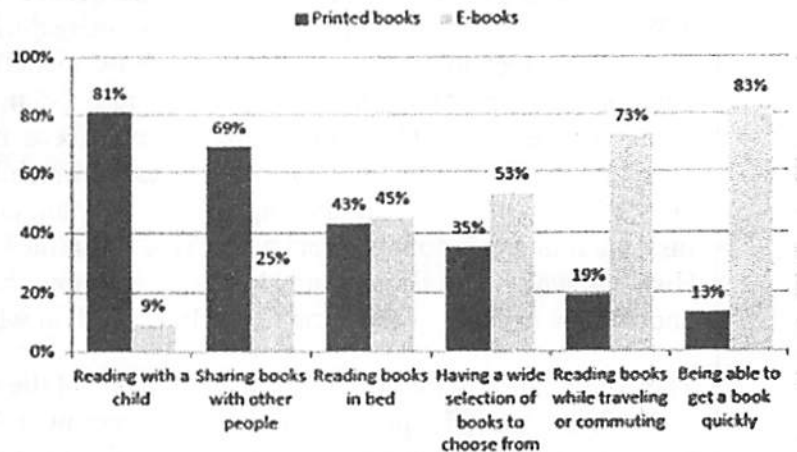
Many districts, schools, and states have begun transitioning from paper textbooks to digital learning environments, according to the "Digital Textbook Playbook." Florida has mandated that all K-12 instructional materials are required to be provided in electronic format by 2015-2016. California launched a free digital textbooks initiative in 2009, and West Virginia replaced social studies print textbook purchases with digital textbooks. Georgia state law requires that electronic copies of K-12 textbooks be made available for use by students, and the San Diego Unified School district has distributed 78,000 digital textbooks to teachers and students since 2011 and purchased 26,000 iPads for district use in June 2012. [6]

The percentage of K-12 classrooms with internet access has increased from 51% in 1998 to 98% in 2012, and 40% of elementary school teachers use computers during in-class instruction. Several meta-studies on the use of computer technology in the classroom show a small but statistically significant increase in learning outcomes. [17] Nineteen percent of children ages 2-5 in the United States, Canada, Japan, Australia, New Zealand, Czech Republic, France, Spain, Italy, Germany, and the UK can use a smartphone application. By comparison, 9% can tie their own shoelaces. More children ages 2-5 can open a web browser (25%) than swim unaided (20%). 20% of children ages 6-9 use email, and 14% are on Facebook. [40] A study by Nielsen Mobile Insights found that 53% of blacks and 57% of Latinos are smartphone users, well above the 45% rate of non-Hispanic whites. [41] Blacks and Hispanics are more than twice as likely to use Twitter and rely on mobile phones as a primary connection to the Internet than whites. [42][43]

The American Association of Publishers says that the average net unit price of a K-12 print textbook was $65 in 2010. [44] A 2005 report by Congress' Government Accountability Office found that print textbook prices nearly tripled from 1986 to 2004, rising at twice the rate of inflation. [45] A report from the Student Public Interest Research Group found that textbook wholesale prices have risen nearly four and a half times the rate of inflation from 1990-2009. [46] Digital textbooks on average cost 50-60% less than new print textbooks. Tablets cost on average $489 in 2011, $386 in 2012, and are projected to cost $263 in 2015. [10][11] However, implementation costs for e-textbooks on iPad tablets are 552% higher than new print textbooks in an average high school, and the annual cost per student per class with tablets is $71.55 vs. $14.26 for print textbooks. [23] This difference is due to additional costs associated with building wi-fi infrastructure, training teachers and administrators how to use the technology, and annual publisher fees to continue using e-textbooks.

According to an Apr. 2012 peer-reviewed study in *Archives of Disease in Childhood*, the average weight of a student's backpack is 15.4 pounds (an average of 3-4 books), and the average weight of a tablet is between 0.75 to two pounds. [5] Pediatricians and chiropractors recommend that students not carry more than 15% of their body weight in a backpack, but an Apr. 14, 2004 study by the State of California found that the combined average weight of textbooks in just the four core subjects of History-Social Science, Mathematics, Reading/Language Arts, and Science exceeded this

percentage at nearly all grade levels from 1-12. [12] According to data from the United States Consumer Product Safety Commission, over the period from 1994-2000 more than 23,000 youths ages 6 to 18 were treated in emergency rooms for backpack-related injuries, such as contusions, sprains and strains to the back and shoulders, and fractures. California and Georgia are the only states with legislation related to textbook size and weight, according to the Association of American Publishers. [48] In California, the maximum weight for a textbook is three pounds for grades K-4, four pounds for 5-8, and five pounds for 9-12.