WHY HAVE U.S. K-12 MATERIALS BEEN SO SLOW TO "GO DIGITAL"?

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An OC&C-Insight

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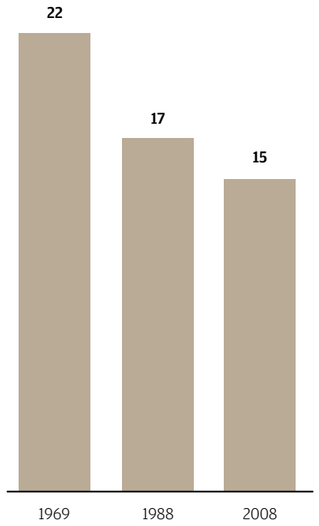
WHY HAVE U.S. K-12 MATERIALS BEEN SO SLOW TO "GO DIGITAL"?

Investors and corporate managers are growing old while waiting for education markets to "go digital". Other information businesses have made the transition, many over a decade ago. The thesis, by analogy, is that the transition in education must be just around the corner. However, this thesis is severely flawed and some large corporates with deep experience in transitioning information businesses to digital modes have divested education assets after experiencing frustrating delays and set-backs – think Reed Elsevier (with Harcourt Education) and The Thomson Corporation (with Thomson Learning, now Cengage).

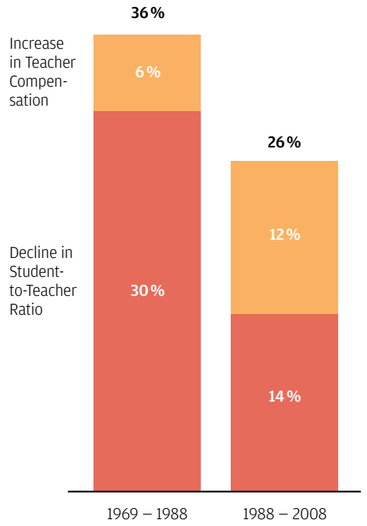
The benefits of the digital transition to mission-critical information businesses are indisputable and attractive. They realize higher growth rates and profit margins as they are no longer constrained by the high fixed cost of print runs and versioning, which allows them to expand the market by developing products and services at price points along the demand curve; and, they can integrate into their customers' workflow to deliver solutions rather than information.

Figure 1

Student-to-Teacher Ratio
Selected Years



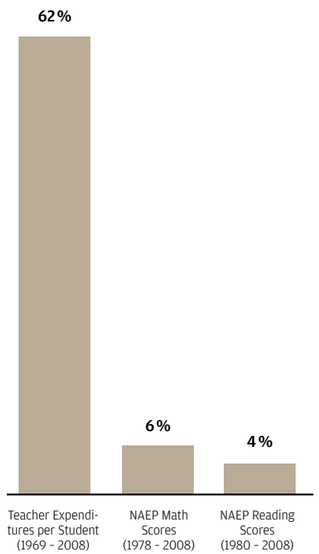
Real Growth in Teacher Expenditures per Student
% Change



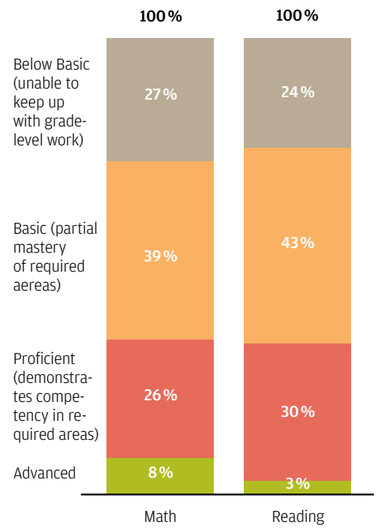
Source: NCES; OC&C-Analysis

Figure 2

Teacher Expenditures per Student vs. Student (Grade 8) Test Scores for Public Schools %, Growth



All Grade 8 Students by Achievement Level (NAEP) %, Achievement Level in Math and Reading, 2011



Source: NAEP; NCES; OC&C-Analysis

The fundamental driver of the higher growth rates and profits is their ability to increase the productivity of their customers' knowledge workers. This higher worker productivity – doing more with the same number of workers or doing the same with fewer workers – generates the economic benefit that allows the customer to: 1) earn a return on the investment in the technology infrastructure that going digital requires; 2) pay more for the new digital services from the information provider; and, 3) pay the worker more. This is the classic substitution of an abundant and cheap resource, technology, for a scarce and expensive one, labor.
The pace of the transition to digital varies proportionally with the productivity gains.

This brings us back to the state of play within the education markets. "Management" (school boards, superintendents, etc.) faces severe constraints in their ability to allocate resources efficiently – including substituting technology for labor – which is limiting the pace of the transition to digital. Those constraints are related to labor, where teacher labor costs comprise c.50% of the total K-12 spend. Teachers are either unionized or organized as a powerful political faction.
This organized labor has been very effective, increasing employment levels relative to students and capturing real wage increases. The net result is that real teacher expenditures per student have increased by over 60% over the last 40 years (figure 1). At the same time, test scores have shown little improvement (figure 2).

Absent a fundamental shift in this power structure, there will not be a rapid, productivity-driven transition to a digital education model. And without productivity gains to share, suppliers are not likely to experience accelerated growth or margin expansion.

IMPLICATIONS FOR K-12 DIGITAL BUSINESS MODELS

The challenges facing K-12 instructional material providers are two-fold:

TECHNOLOGY IS A GATING ITEM AS THERE ARE NOT SUFFICIENT DEVICES TO SUPPORT INTENSIVE 1:1 LEARNING TODAY

1. Labor costs are fixed:

Suppliers are unable to offset the cost of their digital solutions with labor cost savings from the increased productivity that their offerings generate. Consequently, suppliers are largely limited to funding their offerings from existing instructional material budgets, which range between c.$100-$225 per student at the district level and c.$20-$35 per student at the school level. Suppliers can also opportunistically tap into year-over-year increases in federal Title I and IDEA funds.

2. One-to-one technology is not yet a reality:

Technology is a gating item as there are not sufficient devices to support intensive 1:1 learning today. Teachers are not demanding it: some feel it diminishes their role in the classroom while others have a general discomfort with technology and will need substantial professional development in order to use these solutions effectively. Districts and schools, to date, have also not had the financial resources to invest in digital devices for each student. At last count, this ratio was approximately c.3 students per digitally-enabled computer. (We have not seen a "device"-to-student ratio and would estimate that it brings the ratio closer to 2.5).
This lack of 1:1 technology places a limit on the amount and type of instruction that can be delivered digitally within the school: either a few students can use it intensively or most students can use it occasionally.

Absent a significant investment by the districts/schools or an innovative business model bundling devices and digital solutions within existing budgets, it is currently not possible for all students to use digital solutions intensively. Keep an eye on Amplify, who is trying to resolve this issue with a low cost tablet and full curriculum offering.

The successful digital business models work within these constraints. The solutions typically focus on individualizing instruction. This is the most labor-intensive element of teaching: Whole class and group instruction require much less time per student. The fundamental value proposition is using technology to augment scarce teacher time and relieve the bottleneck resource.

The largest market segments are for digital solutions that attempt to improve outcomes for struggling students. These students are a subset of the overall population and there is a sufficient technology infrastructure in place to allow solutions that require intensive computer use. These solutions are sold at the district level. The big picture economic proposition is preventing drop-outs, which cost the district c.$5.7K of state funding per student per year. While district funding for instructional materials for these students varies significantly, it is on the order of $225 per student and often incorporates federal sources such as Title I and IDEA. There are three significant market segments where this model is working:

- **Comprehensive intervention programs:** These programs are designed to help Tier II or III intervention students get back on track. They include more rigorous and frequent assessments in comparison to the traditional curriculum. These students are at risk, either in the near-term or future, of dropping out and are also the core focus of the No Child Left Behind Act (NCLB).

  - Target student: Subset of students who have fallen behind (Tier II/III students), most often in elementary or middle schools
  - Price point: $200-$900, typically in the form of perpetual student licenses
  - Usage: Intensive
  - Example companies pursuing this approach: Scholastic (Read 180 / System 44), Scientific Learning

- **Digital credit recovery courses:** These courses are taken by a subset of students, who have failed a course and are hence drop-out risks. Digital credit recovery courses provide these students with enhanced flexibility (e.g. they can take the course in off-school hours, start mid-semester, etc.) and enable them to focus on the areas where they are less proficient. They are also designed to replace time a teacher would have to otherwise spend working individually with the student).

  - Target student: Subset of students, who are often drop-out risks
  - Average price-point: Pricing models are evolving and include a range of offerings, including single course per student, full suite per student, concurrent licenses and offerings with or without a teacher. As an example, single course licenses (per student) can cost c$40-$100 (no virtual instructor) while per student access to all courses can range from c$150-$250
  - Usage: Intensive
  - Example companies pursuing this approach: Apex Learning, PLATO, Aventa Learning (owned by K12 Inc.), Pearson, Compass Learning, Edgenuity

- **Digital supplemental intervention solutions:** These solutions deliver individualized instruction to students to supplement the core instruction. They are aimed at students who need targeted help in specific areas (e.g. phonics) but do not require a comprehensive program.

  - Target student: Also a subset of students who have fallen behind (Tier II/III students), typically in elementary or middle school
  - Price point: $10-$70
  - Usage: moderately intensive
  - Examples of companies pursuing this approach, Carnegie Learning, Cambium Learning (Sopris)

There are two additional scale market segments for digital solutions. One business model is targeted at schools and the other is targeted at districts:

- **Digital supplemental solutions:** These solutions save the teacher time by automating routine tasks teachers perform while personalizing instruction for each of their students. They are the only digital solutions that have highly penetrated the general student population. These solutions get around the technology bottleneck by being designed for less frequent, less intense usage. These solutions are typically sold to schools (where teachers are the primary advocates) and are priced within their supplemental material budgets of $20-$35 per student.

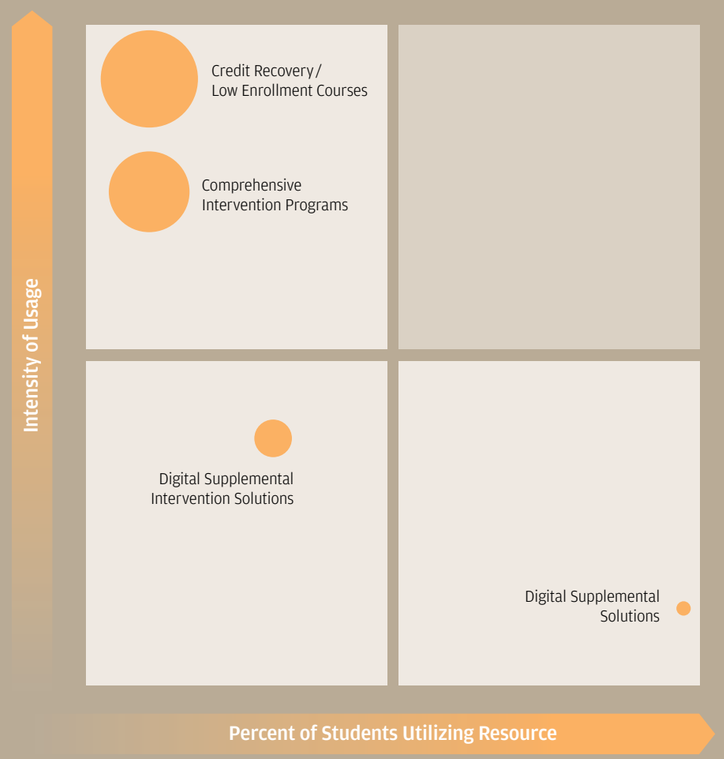
  - Target student: All students
  - Average price point: $4-$15 per student
  - Usage: Designed to be used by most of the students some of the time to overcome the technology barrier
  - Example companies pursuing this approach: Edmentum, Renaissance Learning, Capstone Digital

- **Digital courses for subjects with low enrollment and/or shortages of qualified teachers:** This is the only digital solution sold to the district as a substitute for teaching labor. These courses are taken by a subset of students (typically in high school), so technology is not a bottleneck. Courses tend to be in subjects outside the schools' traditional curriculum (e.g. AP levels and world languages). Hence, districts typically do not replace a teacher; rather, they offer a course they wouldn't have otherwise offered.

  - Target student: Subset of students seeking low enrollment course
  - Average price-point: Similar to credit recovery, these price-points are evolving and vary widely based on the type of pricing model
  - Usage: Intensive
  - Example companies pursuing this approach: Apex Learning, Aventa Learning (K12 Inc.), Compass Learning, Pearson, Edgenuity

CONCLUSION

Intensity of Solution Usage versus Percent of Student Utilizing Resource, K-12 Digital Learning Solutions.
Figure 3



There has been a slow paced "digital transformation" in K-12 to date. The low-priced supplemental solution is the only segment that has highly penetrated the general student population. Inroads have also been made with solutions for subsets of students, where digital assessments are more critical to learning, intensive access to technology can be provided, additional funding streams are available, and the solutions improve the productivity of the learning and teaching workflow (figure 3). None of these offerings have resulted in a labor cost reduction and, as a result, no money has been freed up for purchases of technology devices or additional instructional materials/solutions.

There are potential catalysts to the digital transformation but their impact – both timing and magnitude – is uncertain as they require substantial changes to highly bureaucratic administrative policies across thousands of distinct organizations. There is sufficient money in the system to fund technology solutions that deliver improved productivity and better results but it will need to be redeployed. As an example, increasing the student-to-teacher ratio from c.15 to c.16-17 would result in savings that could pay for devices for c.2/3 of students, in order to achieve 1:1 technology.

Given this state of the K-12 environment today, in order for the pace of the digital transition to accelerate, vendors need to consider the following questions and market realities when developing their solutions:

1. Which budgets are being targeted and does the solution fit? Solutions need be priced at a level where they can fit within the relevant school or district budget. Vendors need to ensure they can earn a sufficient return at those price-points, before developing their solution.

2. Does the solution work with existing technology constraints? Solutions also need to be in line within today's technology constraints (while contemplating a migration path to an environment of 1:1 access) and the inherent constraints that result from a teacher's lack of comfort with technology. Alternatively, vendors will need to provide the technology and support along with their solution.

3. Where does the solution add value? Solutions need to be thoughtfully crafted to make the learning and/or teaching workflow "better, cheaper, and faster". This requires a deep understanding of the workflow and the points where technology can deliver significant benefits. Digital K-12 markets and solutions that are successful today have each done this to varying degrees.

Transitioning the current textbook model to a digital-text for example, going digital for digital's sake, without harnessing technology's capabilities to improve the workflow is a high risk, low value strategy. In other sectors such as music and newspapers, this type of transition to digital has proven destructive to industry profits.

If interested in discussing further, please contact:

Chip Greene, Partner
OC&C Strategy Consultants
chip.greene@occstrategy.com
+1617 896 9926

Vanessa Webb, Associate Partner
OC&C Strategy Consultants
vanessa.webb@occstrategy.com
+1617 896 9966

Offices

Belo Horizonte
T +55 31 3481 0092
Boston
T +1 617 896 9900
Düsseldorf
T +49 211 86070
Hamburg
T +49 40 4017 560
Hong Kong
T +852 2201 1700
London
T +44 20 7010 8000
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T +33 1 58 56 18 00
Rotterdam
T +31 10 217 5555
São Paulo
T +55 11 3053 0434
Shanghai
T +86 21 6115 0310
Warsaw
T +48 22 826 2457

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