eTEXTBOOK PRICING IN THE DIGITAL AGE: LEVELING SALES

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ABSTRACT

Textbook pricing has been a contentious point for many years. Traditional arguments hold that the costs of production and distribution, and the need to recover those costs while maintaining revenue streams, has forced these high prices. Digital books have the promise to remove costs, dis-intermediate the delivery of textbooks, and dramatically lower the prices of text books. Adjusting to the digital age of publishing requires a paradigm shift [5]. Publishers need to think differently about pricing, recognize the opportunity presented by removing the decay in sales caused by the used book market, and adjust their pricing to reflect these new realities. This paper presents this new approach to pricing, hoping to identify a "win-win" for publishers and students alike.

INTRODUCTION

Students have complained about textbook prices arguing that they have been over-priced in relation to other books and far outstripping the rate of inflation[14][23]. For years publishers defended the pricing practices, often citing the limited production runs with the high setup/changeover costs, and the used book market as reasons for the disproportionate pricing. Attention to textbook pricing continued, with the focus shifting to the national level and Congressional involvement. This involvement even resulted in legislation that directs higher education institutions to publish the prices for textbooks selected for their courses. [21]

Parallel with the attention to textbook pricing, we have seen an emergence of digital book technologies. These technologies have expanded over the past decade from simple text readers on desktop computers, to book reader applications on handheld devices such as the Palm, to the recent dedicated eInk reading devices such as the Amazon Kindle, the Sony eReader and the Barnes and Noble Nook.[11][14] Most recently, Apple stepped in to help redefine the digital book reading experience with their iPad device [25] and a plethora of Android based devices are entering the market.

Textbook publishers have engaged with various degrees of involvement exploring the possibility of publishing textbooks in a digital fashion as an "e-textbook." Initial efforts were hindered by the slow development of hardware and software technologies, and by the lack of acceptance by students of digital texts [1][5]. Publishers are once again making a foray into the digital textbook marketspace, with generally proprietary, limited time, and relatively high priced textbooks. Most textbooks are currently being offered simply as digital, short term licensed, copies of existing books [6].

Textbook Pricing Controversy

Students have been concerned for decades about the high prices charged for new textbooks. Several studies have been conducted by student run interest groups and universities to attempt to identify the causes of the high costs of books, and to determine how these costs can be controlled [10][14][18][20][23]. Actions proposed include government involvement and regulation, seeking out

and offering more "open source" materials [19][22], and attempts to influence faculty decisions on selecting texts based on cost in addition to content [20].

In 2005 (and again in 2010) the National Association of College Stores published a breakdown of the prices charged for textbooks in an effort to help the consumer understand where each part of each sales dollar went [15]. According to the 2005 study (which had a greater level of fidelity) the breakout was:

Publisher costs:	32.3%	paper, printing editorial cost
	15.4%	Marketing Costs
	10 0%	General and Administrative cost
	7.1%	Income after taxes
Author Income:	11.6%	
College Store :	11.3%	Personnel
	6.6%	Insurance, Utilities, etc (overhead)
	1.2%	Freight Expense
	4.5%	Income after taxes

The study in 2010 reflected similar numbers, but presented the publisher's value as an aggregated "Textbook Wholesale Cost" figure of 76.6% [16]. The motivation for publishing these figures appears to be an attempt by the bookstores to deflect criticism away from their businesses and lay the responsibly for the increasing prices directly at the feet of the publisher. Regardless of the motivation, we can clearly see a significant portion of the costs of a textbook are directly related to the fact that the book is a "physical product."

Publishers, in their defense, have argued that there are significant "front end" expenses that must be covered when preparing a book for publication that when tied to the comparatively low rates of production for "specialty topics" results in a necessity for higher prices to cover the costs. These costs include not only the editorial costs but graphic design and layout, marketing and overhead costs [9].

Publishers also face strong competition from their own product in the "used textbook market." Once a new book has been released, the demand for new copies that book drops significantly as students sell back their copies of the book, filling the pipeline for the secondary market. Students sell back their books to recoup some of the costs of what they felt were over-priced textbooks, and in addition, look for used rather than new copies of the books to maintain some control over the costs of their education [2][10][18]. In response to this secondary market competition, publishers not only charge higher prices but often have a rather rapid "refresh rate" of 3 to 5 years for textbooks in an attempt to push the used books out of the market and restore sales [4][9] .

Electronic Book Reading Devices

As early as the mid-1990s people in the computer, publishing and education industries were discussing how converting to digital content could help remove costs from the textbook supply chain, shifting the revenues away from the costs of production and delivery, and focusing on rewarding the content creators.[11][13] In order to better understand the market possibilities research proceeded in three areas: hardware development, eReader interface designs, and eTextbook acceptance. As noted previously we

have seen a significant improvements in digital reading technologies with the introduction of the Kindle and the iPad. Not only is the hardware capable of delivering the power and the display resolutions necessary, but the user interfaces have improved, allowing the reader to not only highlight materials but also take notes, and even embed audio commentary along with the text, addressing a concern students noted as keeping them from adopting ereaders [1][8]. As with most technological advances, adoption lags behind the technology. Textbooks, however, may prove to be an exception to this, given that the younger generations tend to lead the curve in adoption of new technologies, and thus may be more willing than some would think to adopt "digital textbooks." While students indicate a preference for paper books, they are open to adopting digital if concerns of ease of use are addressed [1][5].

Students have shown a willingness to use digital textbooks [3][7]. They have identified several key areas that have hindered their adoption of these texts, and each of these areas can be summarized as not providing "value." Current pricing of "mainstream" textbooks in the digital arena are about 50% of the full price of the dead-tree version of the book. In addition, these books are usually limited in the devices a student can use, the format in which they can read the book, the ability to use the highlighting and notetaking features, and finally the duration of time the student can have access to the book [1][2][8].

Imagine as a student, you are faced with two choices: buy a newly released edition of a textbook at full price, that you can read any where, at any time, and sell back to the book store for about 50% of the "new" purchase price; or buy an essentially crippled digital version of the text for half that price. Given the two options, one can see that the final "total landed cost" of the two books are equal, and that the hard copy version of the book provides more utility and thus more value. This is further enhanced when a textbook is one that is often used in a series of courses (such as a calculus 1 through 4 series.) Having the textbook expire at the end of one, or even two, semesters results in a textbook costing as much, if not more, than the hard copy.

This eTextbook pricing scheme seems at best confusing, and at worst (for those conspiratorially minded) designed specifically to discourage adopting of a new technology. Regardless, it seems there exists room in the pricing to allow for even lower costs if one were to closely consider the actual nature of textbook sales.

The Model

As noted, textbook sales begin to decline almost immediately after the release of a new edition[9]. As we discussed above, this is due to the significant "secondary market" for textbooks generated in large measure in response to the high prices of textbooks. I leave it to the reader to determine how this becomes a destructive tautology.

The concept of a "decay rate" for sales is not unique to textbooks. It has been noted in the literature, with emphasis on the high rate of decay due to competition or obsolesence [12][17][24]. Current revenue models for publishers undoubtedly take into account these "decay rates" when determining the price-points, and the refresh rates, for their textbooks. For instance, a book that sells for $100 new could be expected to sell to nearly 100% of the students the in the first semester offered, but by the eighth semester will see only a fraction of the total sales as "new" books. Thus, the publisher may determine that after 4 years, or 8 semesters, they will need to release a new textbook simply to restore the revenue stream. Thus, the realized revenue from the textbook sales over 8 semesters is far less than it would be if 100% of the students were to purchase the book each semester.

It is precisely this decline in revenue that would enable digital textbooks to not only provide a viable means of content delivery, but also allow for a significant reduction in per-unit pricing of the book. This can be understood quite simply by the allocation of the revenue normally received over a period of time (say, 8 semesters) and then assuming the elimination of the decay rate, thus resulting in 100% sales for each semester. It is clear then, that the per book price can be significantly lower simply due to volume.

Providing reasonably priced textbooks coupled with ease of use and portability, as well as a promise of unlimited period of use, should result in a near 100% purchase rate per semester. Specifically, the introduction of "Digital Rights Management" or DRM protected, textbooks, can provide some measure of protection against this decline, or "decay" in sales. While DRM encryption can be broken, we have seen generally that when provided a reasonably priced alternative consumers will pay for a product. In addition, other methods can be employed to ensure that all students receive paid-copies of digital textbooks, however we will leave that for a later discussion.

How can we determine exactly what the pricing could be in such a scenario? In the simplest approach, we simply determine the revenue currently generated by the textbooks given a specific decay rate, and then determine the price needed to generate the same level of revenue if 100% of the students were to purchase digital textbooks each semester.

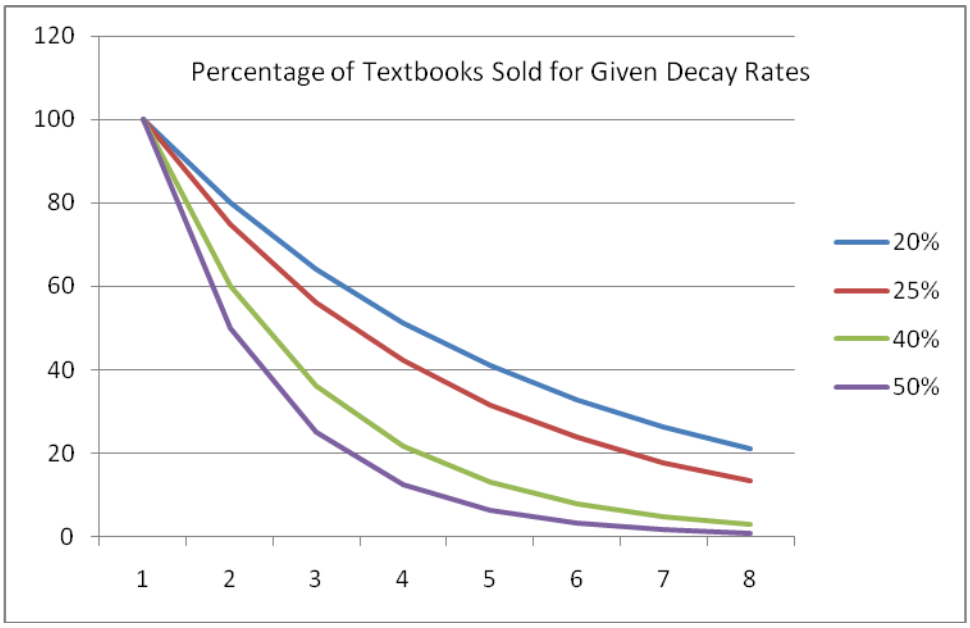

Figure 1 - Rates of Sales Decay

As an example, let's assume we are selling textbooks at $100 per book, and we have 100 students in a class. Assuming a modest 20% decay rate we can see by the chart that only 20 students are still purchasing a new book after 4 semesters. This results in a total revenue of $41,600 over the 8 semesters, rather than the $80,000 that perhaps could have been earned had 100% of the students purchased the book every semester. Given the reality of the $41K in revenue, if one were to assume that digital textbooks could sell to 100% of the students each semester, then the textbook could be sold for $52. In this case, that is comparable to the existing price currently asked by the publishers for digital textbooks--but we are assuming the onerous restrictions are lifted. If we were to assume a more aggressive 50%

decay rate then the textbook could be sold as low as $24.90 and still maintain the same level of revenue. (See Table 1).

Semester	20%	25%	40%	50%
1	100	100	100	100
2	80	75	60	50
3	64	56.25	36	25
4	51.2	42.1875	21.6	12.5
5	40.96	31.640625	12.96	6.25
6	32.768	23.73046875	7.776	3.125
7	26.2144	17.79785156	4.6656	1.5625
8	20.97152	13.34838867	2.79936	0.78125
Total Rev	416.1139	359.954834	245.801	199.2188
New Price	$52.01	$44.99	$30.73	$24.90

Table 1 - New Price while maintaining Revenues

Of course, this approach to pricing assumes that there exists no significant marginal costs associated with the delivery of more textbooks. Certainly, those costs exists in the "hard copy" world of textbooks, with additional copies having to be printed, shipped, and stored and then with returns having additional logistics costs associated with them. These costs are all but non-existent in a digital world where the transfer of of the text is done through the 'Fixed-cost' operations of server farms.

But we must ask, are we only avoiding the additional marginal costs or can we achieve real cost savings through a transition to digital texts. Given the cost structure noted previously, it would seem that a shift from a paper to a digital textbook should result in a reduction in costs.

Recall from above that approximately 25% of the costs allocated to the price of a textbook are for the local "college store." In addition, a little over 32% are identified as "paper, printing and editorial costs." It would not be unreasonable to assume that at a minimum a 25% reduction in costs could be achieved through the elimination of the supply chain costs and sales requirements associated with the physical product.[1] If we now operate under the (conservative) assumption of just a 25% reduction in costs, and seek to maintain the profit margins for the publisher at 7% and the royalties for the author(s) at 11%, then we find that the price for the digital textbooks can be lowered further, with the price given a 20% decay rate dropping down to as low as $36 from $52 for the (previously charged) $100 book, and in the case of the aggressive 50% decay rate, the book could be sold as low as $17.30. (See Table 2)

Of course, the model as presented here is assuming a price designed to "break even" at 4 years. Some have argued that for certain categories of textbooks the demand drops off so precipitously that the refresh rate is every one to two years [9]. Such a drastic decay in sales would result in a need for the model to perhaps “break even” sooner, however this approach also presents another benefit.

[1] In fact, a survey conducted for this research of popular engineering and mathematics texts indicates that the costs of “new” hardcover textbooks through eRetailers does in deed result in a 25% savings—and that is simply for the hard copy of the book. One could easily speculate that additional savings perhaps approaching 40% could be achieved once the costs of producing and handing physical products are removed.

Semester	0.2	0.25	0.4	0.5
1	100	100	100	100
2	80	75	60	50
3	64	56.25	36	25
4	51.2	42.1875	21.6	12.5
5	40.96	31.640625	12.96	6.25
6	32.768	23.73046875	7.776	3.125
7	26.2144	17.79785156	4.6656	1.5625
8	20.97152	13.34838867	2.79936	0.78125
Rem Cost	237.1849	205.1742554	140.1065	113.5547
New Target	289.2499	250.2125066	170.8616	138.4813
New Price	$36.16	$31.28	$21.36	$17.31

Table 2 - New Price after removing 25% of Costs

Assuming consumption/purchase rates remain near 100% this approach to pricing removes much of the incentive for quick "refreshes" of the textbooks. This would result in longer periods of significant revenue, and thus profit generation, between refreshes, not only increasing the revenue per edition, but further decreasing the allocation of fixed costs per edition.

Conclusion

This paper has addressed the need for a shift in the way textbooks are priced, as we see the production of textbooks shift from a physical product to a digital one. We have shown how, by acknowledging the decay rates of textbook sales, and the fundamental change that a digital text brings to reducing if not eliminating the decay rate of sales, the publishers can maintain their revenue streams, rationalize the times between refresh cycles of textbooks to focus on content rather than revenue, and simultaneously provide students with more reasonably priced texts.

Further analysis would be useful to determine actual decay rates by discipline and textbook, as well as assessing which features in books add value for the students, and which are not found to be useful. Finally, discussions should continue on the application of technologies so that prices can continue to be reduced by open-source and open architecture solutions

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