E-Textbooks Advantages and Challenges for the Hellenic Higher Education and Publishing Community

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Structured Abstract

Purpose

In the higher education domain, the shift to electronic textbook adoption entails numerous benefits. However, reluctance is noted by the students as well as by the publishers, impeding the faster realization of this change. Decision makers (such as Ministry of Education and Universities Administrations) need actual survey data in order to plan and perform the best strategy plan for the transition to the e-textbook era.

Design/methodology/approach

Two different surveys took place among higher education students and academic textbook publishers in Greece. More specifically, the purpose of these surveys was twofold: First, to identify both students and local publishers' views towards the e-textbooks as the near future successor of printed books. Second, the results of the in-depth study will enable propose certain solutions for the Hellenic higher education textbook system, which has reached an economic and functional deadlock. Our findings will easily adopted by other, similar educational system across Europe as well.

Findings

Our findings reflect a situation where e-textbooks will replace the printed, but not in the near future as both technology providers and publishers have to overcome many technical obstacles. Students are expecting the transition to occur soon, but still remain very reluctant about the inconvenience might caused to their reading habits.

Originality/value

The results are unique and in alignment with similar surveys in other educational systems.

Keywords:

higher education, e-textbooks, publishers

Article Classification:

Case study

Introduction

The advent of digital publishing is transforming the traditional world of publishing, as discussed by Carreiro (2010) and analyzed by Emerald Publisher (2012) . Recent technological advances in both fields, in the eBook readers as well as in the techniques and standards of eBook containment files (e.g. the new E-PUB 3 standard) act as a catalyst to the transition from printed to electronic academic textbooks (e-textbooks). From an industrial perspective, consumer electronic products such as the iPad or Amazon's Kindle are widespread enough to the

extent where the niche eBook market offers room for healthy competition and innovation, opening a world of opportunities.

As the shift toward eBook adoption is slowly materialized worldwide, it constitutes a change that incurs drastic changes in the way that books are created, managed, distributed and consumed. Publishers and readers are adapting to the new landscape being formed, each one of them according to their own interests.

Before focusing on the transition, it is necessary to define the term "e-textbook". While printed textbooks are self-defined and no further elaboration is needed, an e-textbook definition is necessary. In the context of this survey, an e-textbook is digital material that can be accessed and read on a portable device, such as a laptop, an eBook reader, a smartphone, a tablet, or on a desktop computer. Initially e-textbooks were just PDF files or a set of HTML pages, referred to as the digital version of a printed textbook. Nowadays, since the eBooks abilities have been evolved, e-textbooks can include interactive elements, such as audio, video, animations, simulations, live experiments etc. Moreover, they have inherited all the attributes offered by the Internet for information organization, such as links, online dictionaries, and real-time cross-reference with other sources.

This is a move that can yield numerous benefits to the students and to the publishers. It is expected that the e-textbooks bring several advantages to the learning process, from the point of view of the student, including the following ones:

- Textbooks in either printed or electronic form should meet students' requirements concerning annotation, fast browsing, smart indexing, bookmarks etc.
- Instant access to the content via a few clicks is also a huge advantage for the readers, compared to visiting a library/bookstore in order to obtain a hard copy.
- Especially in the learning process, latest advances enable interactivity with the eBook content, in addition to search capabilities and the other advantages that eBooks have to offer.
- Furthermore, reusability is a concept that, especially in academic publishing, allows students to combine and reuse material covering the same topic but originating from various sources, such as book chapters, even embedded and potentially interactive learning objects.
- Most importantly, latest technological advances have made possible to embed in the e-textbooks dynamic, interactive content that aids much more the learning process.

Among the benefits that publishers are expected to obtain, the following are included:

- Publishers can have a wider outreach of their results, as numerous online services operate, covering an audience far wider than a physical bookstore.
- Greater cost-effectiveness in the eBook production: printing and shipping costs are eliminated

Based on the above, it is clear that the wider e-textbooks adoption is a move to the right direction. However, large part of the directly interested and involved community is still reluctant to adopt e-textbooks, a fact that is largely due to challenges that appear and have to be dealt with, such as content piracy from the point of view of the

publishers, or the technological barrier, from the point of view of the readers. Therefore, the involved players' attitude towards e-textbooks adoption merits further investigation, as far as academic handbooks are concerned.

In this paper we investigate the reasons for this reluctance, through a survey that was conducted using a questionnaire, completed in the course of several months, focusing on students' and publishers' assessment of the e-textbooks.

The paper is structured as follows: Section 1 introduces the related concepts and provides an insight on the broader technological context. Section 2 presents several related surveys on the subject. Section 3 presents in detail the survey environment and all information associated with it. Section 4 is the core of this paper's contribution as it presents and discusses the survey's results, while Section 5 concludes the paper by addressing our most important conclusions stemming from the survey.

Related Surveys

Numerous surveys have been recently published, in an attempt to monitor and understand the preferences and the behavior of the directly interested parties: the readers/end users and the publishers. In a report by the JISC National E-books Observatory Project (2009), it is indicated that course text eBooks are currently used mainly for quick fact extraction and brief viewing rather than continuous reading. Furthermore, although users appreciate the flexibility and convenience that e-books offer, some technical and other barriers (e.g. printing limitations) prevent further exploitation. Also, in the same report it is noted that much has to be done to achieve effective information design for screen-based eBooks.

In a study carried out by Berg, Hoffmann and Dawson (2010) the information retrieval behavior of students, both regarding print books and eBooks, was investigated. Among the most important findings of this work was that students appeared to understand the conventions of print books, which resulted in more direct processes for information seeking than when using eBooks. However, the students appeared to be uncertain about the structure and functionality of eBooks.

At the study presented by Li (2011) and conducted in the academic domain, more than half of the survey respondents use e-textbooks in their work. Percentages are bound to fluctuate according to the discipline, but the bottom line is that the usage of e-textbooks is common. In the same survey, it is revealed that at all e-textbooks are not usually preferred over print books.

Additionally, as Lai (2011) suggests, convenience, compatibility, and media richness all significantly contribute to broader eBook reader acceptance.

Moreover, Grajek (2013) presented the results from a pilot program, where 23 colleges and universities collaborated to deliver digital versions of textbooks to over 5,000 students and faculty in 393 undergraduate and graduate courses. As far as the students were concerned, they appreciated the portability of e-textbooks and the convenience in obtaining them, simply by downloading them. At the same time, the students expressed frustration during eBooks content navigation through their devices.

According to a recent survey among dental assisting students conducted by Parsons (2014), it becomes obvious that while they were open to the idea of electronic textbooks and willing to use them, they overwhelmingly preferred to use traditional print textbooks.

Similar results were found by Shepperd, Grace and Koch (2008). Students that used e-textbooks spent less time reading them and did not receive higher grades in the course, compared to the students that used printed books. It is remarkable that all students that had used an e-textbook in a previous course chose not to obtain another for future courses.

In addition, Woody, Daniel and Baker (2010) claim that students prefer textbooks to e-books for learning and this preference is not affected by familiarity with the medium. The main conclusion of their study is that e-textbooks are not as comfortable to read as printed textbooks and that the design of an eBook needs to differ from that of a textbook in order to provide a more constructive user experience.

Sleby, Carter and Gage (2014) find, in a survey similar to the hereby presented, that Michigan State University students used far more printed textbooks than e-textbooks and the future promise for e-textbooks usage is limited. However, the survey results suggest that students are willing to experiment with different textbook vendors, if factors like functionality, cost and content are improved, leading to further exploitation.

As far as publishers are concerned, another survey on the adoption of e-textbooks/eBooks attempting to predict the future of e-textbooks from the point of view of publishers and librarians is also presented by Lynch (2012). The survey is largely based on the 2011 Frankfurt Fair, and, among others, it finds that publishers have not yet developed an appropriate business model for pricing and distributing e-textbooks. Other surveys indicate that their most challenging tasks in coping with the major changes in the publishing industry include dealing with piracy (Carreiro, 2010) and even simply managing e-textbooks (Vasileiou, et. al., 2012).

Compared to the aforementioned approaches, the hereby presented work offers a more spherical overview on the digital publishing problem, as it is examined both from the point of view of the students as well as from the point of view of the publishers, trying to discover the reasons that impede wider eBook acceptance. It is important to take into account that this is the first large scale survey that has been conducted in Greece about eBook technology, which will help local decision makers and stakeholders, as well others in countries with similar dilemma concerning the transition to e-textbooks (e.g, Scandinavian countries, Portugal, Spain, Italy, France etc.)

Environment and Survey Development

This Section provides an overview of the survey environment and specific information on the survey design and execution.

Hellenic Higher Education Academic Textbooks System

Every academic year, in Greece, higher education students receive for free their textbook printed copies for each course per semester. The economic burden caused from the free textbooks system is undertaken by the state, that is why it is rising during the latest years in combination with the financial crisis led to a substantial expense-cut decision. At the same time, academic libraries' acquisition budgets have gradually dropped almost to zero (according to 2013 data) as all funds were diverted to cover printed textbooks costs. Although the restrictions opposed by the Ministry of Education led to cost reduction (<20%), the textbook system still remains too expensive and time-consuming to be sustained in its present form. In such an environment, the transition from the printed books to the e-textbooks is a solution that deserves a deeper investigation as it could be the only viable solution.

Survey Information

In order to investigate the eBook status in Greece, we conducted two different surveys, the first one concerning Hellenic higher education students and the second one the publishers that are already involved in the printed textbooks system. Information for the two surveys is depicted in Table 1.

Table 1: Greek higher education students and publishers information surveys

Students Survey	
Type of survey	Telephone interview (2011)
Students Sample	5,432 undergraduate students (thematic, geographically and per year of studies distributed sample)
Students responded successfully	2,120 (39%)
Sample error (Confidence Interval: 95%, total population 280,000)	2.12%
Universities vs Technological Education Institutes (responded successfully)	67% - 33%
Per thematic category of studies (responded successfully)	Biology, Medical Sciences (13.3%) – Social Sciences (34.8%) – Natural Sciences (6.4%) – Engineering, Computer Science (31.8%) – Humanities (13.7%)
Publishers Survey	
Type of survey	Online questionnaire (2012)
Publishers Sample	600
Publishers responded successfully	135 answers (22.5%) – 105 publishers completed the questionnaire (17.5%) – 30 (5%) partially completed the questionnaire
Sample error (Confidence Interval: 95%, total population 600)	8.7%

The survey on the students' views was performed via telephone interviews, as part of the Eudoxus project (www.eudoxus.gr). A sample of 5,432 undergraduate students was chosen from 42 Higher Education Institutes (HEIs), covering all disciplines and different year of studies. The response rate was 39%, uniformly distributed among HEIs and different disciplines (see Table 1). A special application was developed that had the ability to present the interviewees' information (name, contact details, institute, department, year of studies etc.) and store, at the same time, the answers given based on a structured questionnaire with five simple questions. At the end of the survey the results were extracted from the application and analyzed using Microsoft Excel.

The sample was well-distributed resulting low sample error and adequate representation with students from all study topics categories was achieved. The most important results are analyzed next, in Section 4.

Survey Results & Discussion

The Students' views

The first question aimed at identifying students' views regarding whether e-textbooks would dominate over printed books used for their studies in the next few years. Students had to choose among five options (I totally agree, I agree, maybe, I disagree, I totally disagree). The results for these questions are depicted in Figure 1.
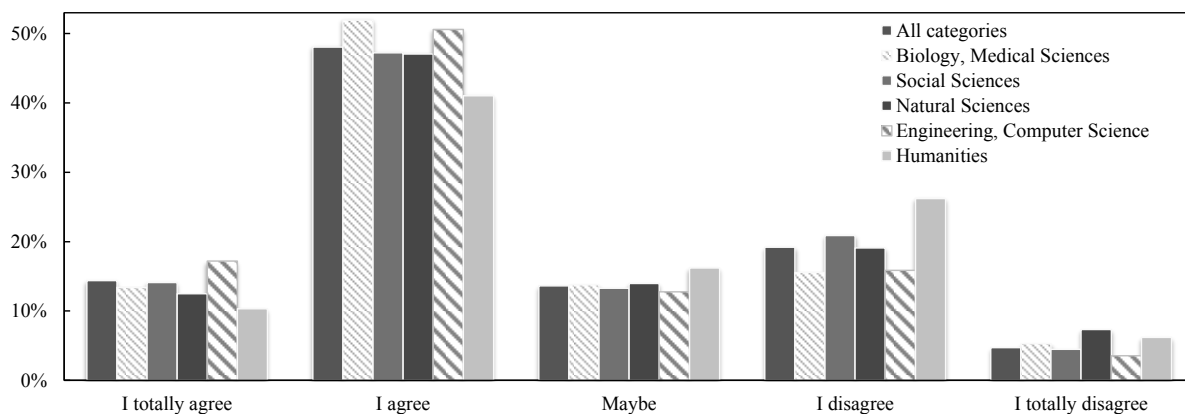

Figure 1. Students' opinion on how likely it is that e-textbooks will dominate over printed books in the near future

More than 62.5% of the students agreed or totally agreed with the prediction that e-textbooks would be the main delivery format for textbooks in the near future. On the other hand, 23.9% disagreed or totally disagreed with that prospect. From the in-depth analysis of the results, students in humanities studies were, once more, reluctant compared to others to agree with the assumption that e-textbooks will dominate over printed books (of whom 51.4% agree or totally agree and 32.4% disagree or totally disagree), while engineers and medical students appeared to be the most positive.

The next question asked the students about their preferable format for their textbooks, meaning e-textbooks or printed books. As it was expected, the printed book was still the preferred mean to access scientific information

(81.5% preferred printed books over 14.7% preferring e-textbooks). Again, results for this question are not deviating between scientific categories of students' studies, except from the engineering and computer science field where the students preferring e-textbooks are close to 18.8%.
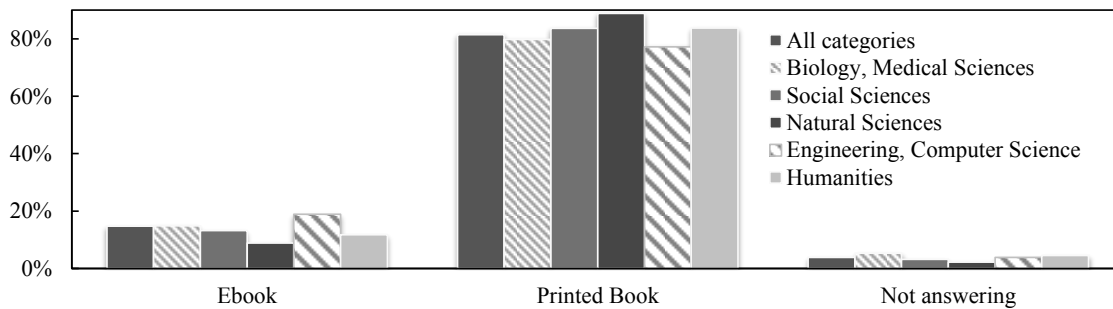

Figure 2. Students' preference: e-textbooks vs. printed books

Figure 3 shows the results in relation with what the students believed to be the main advantages that eBook technology offers. There were four predefined answers as well as an option to add comments. Students could choose more than one answer and also add their comments.

(a)   (b)
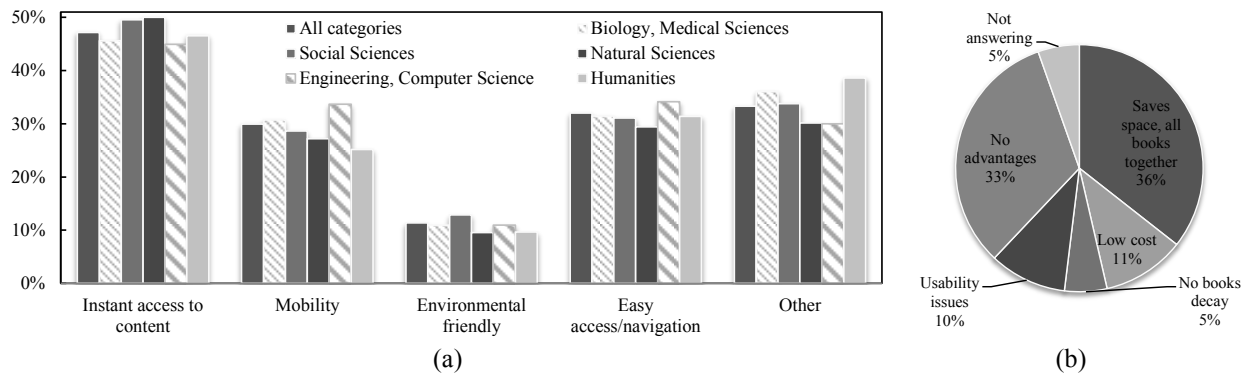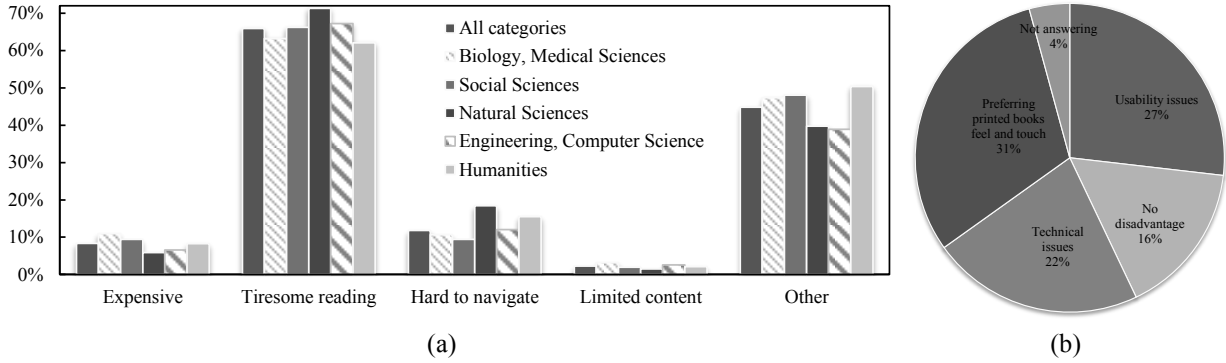
Figure 3. (a) Students' opinions on main eBook advantages (b) Analysis of other advantages the students claimed to find

The most important advantage is instant access to the content, which is easily explained by the fact that the current textbook system is characterized by delivery delays, since the waiting period often exceeds even a month after the student places his/her order. Other important reasons include the ease of access to the content and navigating in it, and the mobility, i.e. the fact that one can carry all their books in a laptop or an eBook reader. Reasons like environmental friendliness were not considered so important. By analyzing the other answers provided by the students (see Figure 3b pie chart), it becomes clearer that most students remarked the mobility convenience, the fact that eBook technology enables the possibility to keep all textbooks together saving space (around 35.6% of "Other" category or around 12.1% of all answers). Besides, although mentioning advantages like low cost, ease to read and to update content, no book decay etc., a significant percentage (around 32.5% of "Other" category or around 11.1% of all answers) found that e-textbooks offer no advantages.

On the other hand, Figure 4 shows the results as to what students believed to be the main disadvantages that the eBook technology offers. Here as well, there were four (4) predefined answers, plus an optional addition of comments. The most important disadvantage was claimed to be the tiresome reading effect caused by an extensive use of the electronic device. This is an interesting finding that explains the low penetration of e-textbooks to academia. All other reasons like "hard to navigate", "high cost" or "limited content" were also considered important but obtained lower percentages of the students' opinion.

(a)   (b)

Figure 4. (a) Students' opinions on main e-textbooks disadvantages (b) Analysis of other disadvantages the students claimed to find

By analyzing the feedback with reference to the e-textbooks main disadvantages, except for the preference to the touch and feel of the printed books (30.7% of "Other" category or around 14% of all answers), the students indicated two major disadvantages that e-textbooks present. The first one was about the usability issues, specifically the note keeping functionality, which seemed to be either absent or very limited. The second one involved technology related issues like low autonomy, Internet connection necessity, malfunctions or hardware problems that may occur.

The last question of the survey aimed at identifying the importance of printed books for the course final exams as well as the level of their reuse during the studies period. Results are indicative of the printed textbooks system's failure. Specifically, textbooks were the main reason for successful results in final exams only for 26.5% of the students. Teachers' notes were chosen by 60% of the students while textbook and other students' notes were around 8.2% of the students' opinions (see Figure 5).
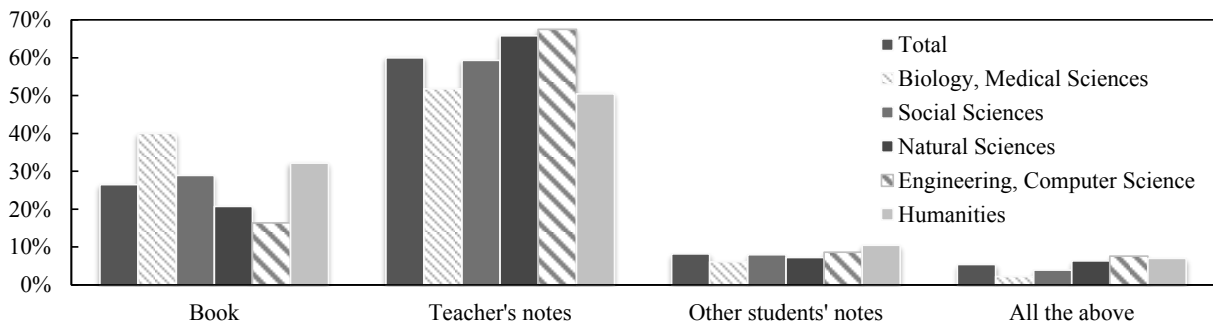
Figure 5. Students' opinions on the most important factors for success in the course final exams

Significant deviations were noted among students from different scientific categories studies, especially between medical sciences and humanities (as they prefer printed books in higher percentage), and natural sciences and engineering/computer sciences (as they prefer teacher's notes in higher percentages). Specifically, the textbook was most important for students in biology and medical sciences (40%), while the second highest percentage was in students in humanities (32.2%). On the other hand the lowest percentage was in students in engineering/computer sciences (16.3%). Students in both engineering/computer sciences and natural sciences considered teachers' notes important with scores that exceed 67.5% and 65.8%, respectively. These results indicate that textbooks are not an important factor for students' studying.

In order to obtain an overall picture of the academic textbook situation in Greece and enable the transition to the e-textbook era, the publishers' views on the subject should be also examined. Their opinions, resulting from the survey are noted in the following Section.

The Publishers' views

Since the publishers are the main scientific content stakeholders, their views in relation with the e-textbooks technology adoption as an alternative to printed textbooks are very important. As noted in Table 1, around 600 publishers where invited via email to participate in an electronic survey. A hundred and thirty five (135) publishers responded and among them, 105 provided full answers while 30 of them did not fill in some of the questions.

As it can be seen from the data analysis, more than 60% of the publishers that participated in the survey are related to scientific-academic books, as expected, while a 45% of them are very small publishers, owning less than 30 book titles. This partly explains the low penetration e-textbooks technology into the Greek market, as the transition requires significant investment.

As expected, 25% of the publishers offer their books both in printed and some electronic format. This percentage does not appear to be changing soon as only 7% of the publishers are about to make the big step, while another 48% either are still under consideration (27%) or completely negative to the idea (21%). An 18% of the publishers chose not to answer this question.

The differentiation between "large" and "small" publishers is noticeable, as already 40% of them already provide books in printed and electronic format. Publishers that already offer e-textbooks to their customers prefer PDF files to deliver the content, although it is not the most suitable format for using with e-readers.. Only 21% uses the EPub format and less than 15% prefers to offer their books through Apple's online service iBooks. Apparently, the sales percentage of e-textbooks is low compared to the printed books. This is the main reason why publishers are not speeding up the transition process.

Next, in Figure 6 and Figure 7, as in the students' case, we present the e-textbooks advantages and disadvantages from the publishers' point of view. For each of the questions, four (4) predefined answers were given, asking participants to order them from the most significant to the least significant one, based on their point of view. Answers in Figure 6 and Figure 7 are sorted according to the ranking of publishers. As the most important

result, we consider the option that was ranked as first by the publishers most of the times. Specifically, Figure 6 depicts that 57% of the publishers perceived e-textbooks as an opportunity to reduce the production costs from traditional printing, while, at the same time, they were assuming that delivery over internet might increase their sales: 21% of the publishers ordered this advantage as the first and 42% as the second most important advantage. New technological functions or environmental issues were not deemed so important.
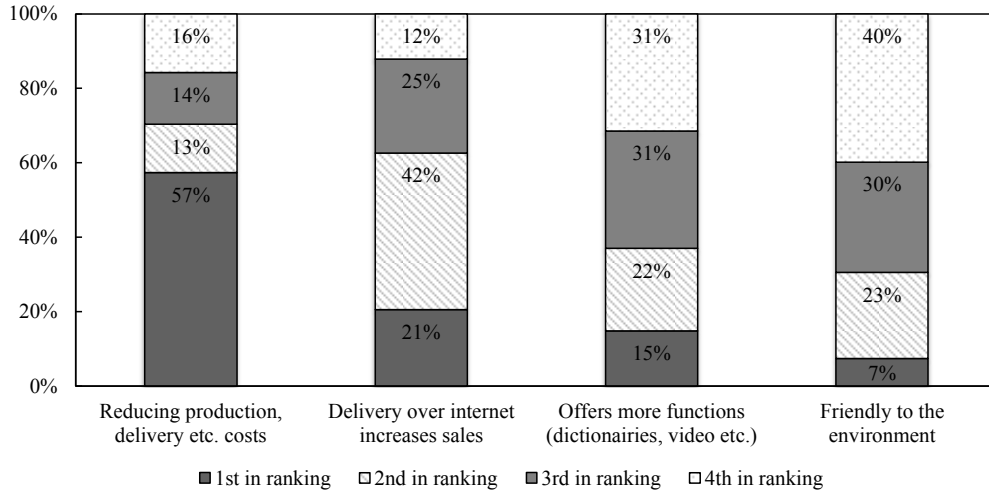
Figure 6. Publishers' views on the most important eBook advantages

The results clearly show that the most important concern by publishers is piracy: the ease of distributing illegal copies, once a book is in an electronic format, a disadvantage pointed out to be the most important (first in ranking) by 68% of the publishers. Next, both the cost of e-readers and the tiresome reading are almost equal as the most important disadvantages, occupying second and third place.
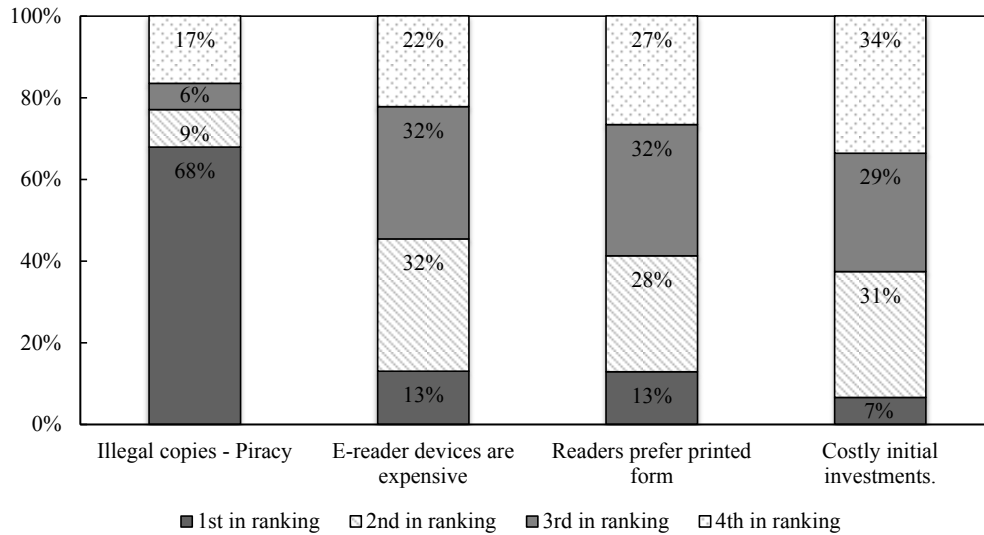

Figure 7. Publishers' views on the most important eBook disadvantages

Discussion and Conclusions

This survey highlights the large gap, in terms of available content, sales and technology adaptation, that the Hellenic Academic textbook market presents compared to similar markets in other developed or developing countries, as far as it concerns e-textbooks.

Hellenic higher education students do not use e-textbooks as textbooks, mainly because they are not available or because access to them is materialized through the use of impractical interfaces. Students, however, are convinced that e-textbooks are going to replace printed books in the near future. The important question that emerges, once the transition has been completed, is if the technological evolution will provide the means to implement the necessary functionality, this way satisfying the students' special needs. Specifically, the display technologies need to be further improved eliminating tiresome phenomena, even when colored content is represented. Additionally, eBook annotation systems should be further improved, in a way that resembles the way students are usually taking notes on printed books, while attributes like collaborating or sharing the additional information produced should be also included. Finally, attributes like instant access to the content, constant on-line presence, long battery duration, high storage capacity (needed especially in cases when e-textbooks contain multimedia elements) etc., are considered necessary and, to some extent, are offered already.

Although Publishers in Greece (and globally) realize that e-textbooks are the future (as students do), they are not eager to move towards the new era or at least offer both format options (i.e. printed and electronic versions of their titles) to their customers. As expected, piracy and illegal copying are the most important reasons, for those of the publishers in Greece that are involved in the academic textbooks market, not to support e-textbooks as an alternative access format. On the other hand, e-textbooks are the only solution to cut down the production expenses, especially under the current circumstances, when Greece is facing a severe financial crisis. E-textbooks can be easily produced and delivered to end-users, elimination printing and circulation costs, while instant access through the Internet, led in many cases to higher sales and, respectively, to higher total revenue, especially when content is considered of high quality.

In addition, as far as concerns the transition to digital content, there is a contradiction, between the necessity for cutting spending on textbooks acquisition by HEIs and students through the introduction of e-textbooks and the clear preference of the latter to printed content. It is clear that much has to be done to overcome technological barriers, improve content representation and exploit the full potentials of eBooks advantages.

Academic community and publishers should elaborate new ways to access scientific content and make concrete plans of for the transition to the e-textbook era. Finally, starting and re-enforcing Open Access activities in the area of academic e-textbooks is very important, a move that is being materialized by the Kallipos project (www.kallipos.gr) in Greece and other similar projects such as OpenEdition (www.openedition.org), OApen Foundation (www.oapen.org) etc.

Acknowledgments

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