



# Mobile Education Landscape Report

This report describes emerging trends, key players and current initiatives in the emerging global Mobile Education and related e-Textbook Publishing markets.



# Foreword



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The mobile communications industry is a global success story. There are now more than 5 billion mobile connections worldwide and we will reach the 6 billion connections milestone by the end of 2011. Looking beyond the sheer number of connections, the mobile industry generated \$788 billion in annual revenues in 2010, and is forecast to reach \$1 trillion in annual revenues in 2013 (IDC). It has invested more than \$120 billion in CAPEX in 2010 (Deutsche Bank). Mobile has a broad economic and social impact with studies showing that a 10% increase in mobile penetration will drive an increase of 1.2% of a developing country's GDP (AT Kearney).

The mobile industry has experienced several waves of innovation over the past two decades. The first wave of mobile was simply connecting people around the world; indeed, one of the core strengths of GSM has been its ubiquity, underpinned by interoperability. The second wave of mobile is enabling the world's population to access the Internet. By 2013, more people will access the Internet via mobile than PCs (Gartner).

The third wave of mobile will bring all of this together, connecting people and things around the world, across business and personal lives. Only mobile operators, with their global scale and focus on interoperability, can build the ecosystems to deliver this Connected Life for the benefit of businesses and consumers.

## Mobile Education

For the Education sector, mobile connectivity provides an opportunity to offer new ways of teaching and learning that ultimately will improve performance and results whilst at the same time open up new markets for mobile operators across the world. Mobile will increase access to up-to-date materials, will enable collaboration and strengthen learner engagement. In response to this opportunity, the GSMA's Mobile Education initiative aims to accelerate the adoption of Mobile Education solutions; in particular, the use of mobile-enabled portable devices, such as e-Readers and tablets in mainstream education settings.

This report considers the development of Mobile Education from a global perspective, focusing on the supply side; it describes emerging trends, key players, current initiatives and related e-Textbook publishing markets. We have also published a series of country-specific reports which consider the demand for Mobile Education from the formal education sector in each country: France, Japan, Spain, United Kingdom and United States. An accompanying background document; Education Systems – A Brief Introduction gives background on how education segments and systems function and describes flows of funding.

## GSMA's Mobile Education Initiative

This global initiative seeks to understand and address the landscape, barriers and opportunities in this emerging market. While education systems are country or even local authority specific, we believe that globally coordinated activity drawing on common experience sharing and best practices will be vital to understand and act upon the Mobile Education opportunity. I encourage you to get involved, whichever part of the ecosystem you belong to, please contact [mobileeducation@gsm.org](mailto:mobileeducation@gsm.org) to learn how.

# Contents

<b>Foreword</b>	<b>2</b>	<b>6 Textbook and e-Textbook Publishing</b>	<b>33 – 52</b>
<b>1 Introduction</b>	<b>4 – 5</b>	6.1 Traditional Textbook Markets:	
		– Products	
		– Provision	
		– Market Size and Growth	
<b>2 Summary of Main Themes</b>	<b>6 – 9</b>	6.2 Impact of e-Books:	
2.1 e-Education to Mobile Education		– e-Book Readers	
2.2 Key Mobile Education Trends		– e-Textbooks	
2.3 Mobile Education Activity		6.3 Disruption to Business Models	
2.4 Key Players in the Mobile Education Market		6.4 Impact on Wider Ecosystem	
		6.5 Responses of Leading Publishers:	
<b>3 Background to the Development of Mobile Education</b>	<b>10 – 17</b>	– Cengage Learning	
3.1 e-Education ...		– John Wiley	
3.2 ...to Mobile Education		– McGraw-Hill	
3.3 Mobile Education Ecosystem		– Macmillan	
3.4 Global Initiatives		– Pearson	
		– Other Players	
<b>4 Market Size and Potential</b>	<b>18 – 19</b>	<b>7 Appendix</b>	<b>53 – 61</b>
<b>5 Commercial Players:</b>	<b>20 – 32</b>	7.1 Global Mobile Education Initiatives:	
– Amazon		– Global Examples	
– Apple		– National Examples	
– Barnes & Noble		7.2 Example of Educational Apps	
– Blackboard		7.3 Exchange Rates	
– Google			
– Microsoft			
– Pearson			
– Sony			
– Other Players			

# 1 Introduction

## 1 Introduction

- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

## Definitions

The main focus of this report is Mobile Education, which is interpreted as:

- Use of individual, portable devices (e.g. e-Readers, tablets, Personal Digital Assistants (PDAs), and smartphones), which make use of the mobile network (i.e. are SIM-enabled).
- Used in mainstream education settings (e.g. primary, secondary, college, workplace, distance learning, professional qualifications), therefore aligning with curriculum objectives or used for high-stakes assessment, and will cover both learning (e.g. interactive learning), content (e.g. textbooks) and administration (e.g. school records, attendance, communications).

In this report, we refer to three main education segments. The segments are defined as:

- **Schools:** learning is delivered only in formal education settings in specific institutions with clear flows of funding.
- **Technical and Vocational Education and Training (TVET):** learning is delivered in a wide variety of settings, including formal education institutions, the work-place, via distance learning and in casual or self-directed settings (the latter are informal learning settings). Activities can include learning for qualifications, training for specific tasks or skills, training for 'softer' management skills, leadership development skills, certifications, professional training, etc... Mostly formal settings are described in this report.
- **Higher Education (HE) (also referred to as Tertiary Education):** learning is delivered mostly in formal education settings in specific institutions with clear flows of funding, but can also be delivered as distance learning.



The school and higher education systems are generally clear and straightforward to describe, but the systems for TVET can be more complicated. In part this is because they typically overlap with the school and higher education sectors, but also the policy focus can be quite variable.

## Background

This is one of a series of landscaping reports, which collectively describe the emerging market for Mobile Education. This report considers the development of Mobile Education from a global perspective, focusing on the supply side of Mobile Education.

The report is accompanied by a series of country reports, which consider primarily the demand for Mobile Education from the formal education sector. Countries covered are France, Japan, the United Kingdom, United States and Spain. An accompanying primer on education systems gives background on how education segments and systems function and describes flows of funding.

## Structure

This report opens with a summary of the main themes relating to the emergence of a Mobile Education market, drawing together conclusions from this report, as well as some references to the separate country landscaping reports.

A background section places the development of Mobile Education as part of the wider technological developments in the education sector. It also considers the potential shape of Mobile Education ecosystem and draws attention to stakeholders with a global remit, including examples of global Mobile Education initiatives. This is followed by a short section on market size and potential for Mobile Education.

The following section on commercial players examines some leading education, technology and online players to identify if and how they are approaching the market for Mobile Education. For each player, we look at activities across the Mobile Education ecosystem, such as devices, content and distribution, as well as digital and Mobile Education strategies.

Finally, we focus on the publishing sector, examining the impact of digital delivery and mobile devices on the traditional textbook publishing market. Taking the traditional market as a starting point, we look at the impact of e-Books and the disruption this has caused to the market and existing business models and segments. We also describe the e-Textbook strategies of some of the main textbook publishers.

## Target Audience

The target audience for this report is managers from:

- Mobile ecosystem organisations responsible for consumer devices, institutional customers or M2M services.
- Education content organisations looking to expand in to Mobile Education.
- System and software developers with an interest in developing Mobile Education solutions.
- Government departments or education institutions wishing to understand more about the landscape of Mobile Education and e-Textbooks across the world.

### 1 Introduction

2 Summary of Main Themes

3 Background to the  
Development of Mobile  
Education

4 Market Size and Potential

5 Commercial Players

6 Textbook and e-Textbook  
Publishing

7 Appendix

## 2 Summary of Main Themes

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### 2.1 e-Education to Mobile Education

There have been large investments in ICT in education over the last decade - 5.5% of education revenues are now spent on technology and global education IT expenditure was \$64.15 billion in 2010, showing 2.5% growth even after the financial crisis<sup>1</sup>. ICT in education is at widely varying stages in different countries and covers a wide spectrum of activities including: infrastructure development (connectivity and hardware), teacher training, technical support, changes in curriculum and pedagogy and content development.

Despite increasing device ubiquity and connectedness, and growing appreciation of the benefits, Mobile Education remains mostly an aspiration and there is not a clear market in place. The US mobile learning market reached \$958.7 million in 2010, and is estimated to reach \$1.82 billion by 2015.<sup>2</sup> We would expect the Mobile Education market within this to be around \$220 million, which as the biggest in the world implies a relatively small flow of revenues currently.

Whilst the market itself is small, there is a great deal of expectation building around Mobile Education. The annual Horizon Report on emerging technologies in education identifies e-Books and mobile devices as moving closer to mainstream adoption. It is also an emerging agenda item for national governments, and at supranational level. UNESCO has a new policy on mobile learning and a strategic alliance with Nokia, and the World Bank is conducting a research study to map mobile learning initiatives. They have accurately described the current situation and made a call to arms, stating that:

*"Nascent efforts are underway to explore various aspects of the emerging phenomenon of the use of mobile phones in education, but no institution has stepped forward to help catalyse global collaboration and cooperation around research directions and agenda setting in this area the use of mobile phones in education is at the very early stages of what is poised to become a potentially massive area of investment by ministries of education, civil society and especially the private sector in the decade to come."*<sup>3</sup>



### 2.2 Key Mobile Education Trends

Ambitious 1:1 laptop programmes, led and partly funded by corporate sponsors and development organisations, focus mainly on developing countries. Cheaper and smaller netbooks, and increasingly tablets, have helped make this objective more realisable in developed markets, and in fact, One-Laptop-Per-Child has now shifted to the Marvell tablet device. 1:1 provision of netbooks is increasing in developed markets – a recent report<sup>4</sup> identified 33 initiatives in 18 countries across Europe.

In a few instances, efforts are being made to support the use of student's own devices, and for many this is the most viable way forward. However, the new Google Chrome-Book could signal a shift. For this product, the user's tools and content is no longer tied to the device, but sitting in the cloud for immediate access from any Chrome-Book or mobile device. With an attractive leasing model on offer to education institutions, this could shift the debate away from 1:1 devices.

The transition to e-Textbooks, which has accelerated over the last year, makes this the most established Mobile Education trend. e-Reader devices have entered the mainstream, but they are still not entirely appropriate for textbooks. However, the iPad looks to have made that leap. New approaches to converting textbook content to iPads, for example, those developed by Inkling, and native iPad e-Textbooks are beginning to be developed, for example, for the State of Virginia digital curriculum.

Publishing companies are now accepting and adapting to this transition. Initially, many tried to sell digital versions of existing printed textbooks through publisher-owned and managed distribution channels (i.e. CourseSmart). Now, textbook publishers are realising the possibilities of digital formats combined with new technologies, typified by the investment of Pearson and McGraw-Hill in Inkling.

1 Forecast: Enterprise IT Spending by Vertical Industry Market, Worldwide, 2008-2014, 2Q10 2Q10 Update, Gartner

2 The US Market for Mobile Learning Products and Services: 2010-2015 Forecast and Analysis, Ambient Insight 2011 Forecast: Enterprise IT Spending by Vertical Industry Market, Worldwide, 2008-2014, 2Q10 2Q10 Update, Gartner

3 World Bank  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTEDUCATIO/N/O,,contentMDK:22267518~pagePK:148956~piPK:216618~theSitePK:282386,00.html>

4 Netbooks on the Rise: European Overview of National Laptop and Netbook Initiatives in Schools, Insight Observatory for New Technologies in Education, Nov 2010  
[http://cms.eun.org/shared/data/pdf/netbooks\\_on\\_the\\_rise.pdf](http://cms.eun.org/shared/data/pdf/netbooks_on_the_rise.pdf)

Educational apps are an area of significant growth, with useful content presented in a stimulating way and with memory aids and quizzes to consolidate learning. Some are mapped to curriculum targets and designed for use in classroom settings or to use as part of homework. Another interesting area is the development of mobile campus apps, which act as a 'window' to the campus on individual devices. These are most powerful when they are linked to an institutions' learning management system (LMS) compatible with mobile devices, which is another area of exciting developments.

### 2.3 Mobile Education Activity

Throughout this report we refer to four types of Mobile Education activity, based on the type of organisation initiating it: global, national/ regional, local/ institutional and commercial.

Global initiatives are quite high profile and generally focus on distribution of devices i.e. One-Laptop-Per-Child (OLPC), World Ahead. At a national/ regional level, there are also programmes to distribute devices, as well as examples of policies supporting Mobile Education, i.e. Spain, Singapore, and Ireland. More often, there are nationally or regionally coordinated trials which, when successful, can trigger a wave of interest and put in place a framework to progress further – MoLeNet in the UK, which has firmly established Mobile Education in the further education segment, is a good example of this.

Most initiatives are small-scale and institution-led, aiming to explore or prove the possibilities presented by mobile devices in education settings. Some are sustained and expanded, some fizzle out or fail. They feed into a plethora of commentary, academic papers and online discussion, and increasingly, onto the radars of governments and companies, who are well placed to commercialise them.

A good example of an initiative making the transition to the commercial market started as an idea on the campus at Stanford. This grew into a one of the first mobile campus app (iStanford) created by students under an umbrella company (TerriblyClever). The company was then acquired by a major education technology company (Blackboard), which developed the original concept into a groundbreaking new commercial product (Blackboard Mobile), which has been replicated by other providers (Desire2Learn, Datatel, Sunguard Higher Education).

A small but potent group of commercial players are supporting local initiatives, developing new products and positioning as first movers in the Mobile Education market.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

1 The US Market for Mobile Learning Products and Services: 2010-2015 Forecast and Analysis, Ambient Insight 2011

2 World Bank  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTEDUCATIO N/0,,contentMDK:22267518~page PK:148956~piPK:216618~theSite PK:282386,00.html>

3 Netbooks on the Rise: European Overview of National Laptop and Netbook Initiatives in Schools, Insight Observatory for New Technologies in Education, Nov 2010  
[http://cms.eun.org/shared/data/pdf/netbooks\\_on\\_the\\_rise.pdf](http://cms.eun.org/shared/data/pdf/netbooks_on_the_rise.pdf)

Table: Examples of Mobile Education Trials

Country	Segment	Device	Details	Status
UK	Further Education	PDA's	<b>ALPS Mobile Technologies Project</b> Used PDA's to access learning materials and submit data for assessments in the workplace	Implemented and expanding
UK	Schools	PSP and Wii	<b>Yewlands – Interactive Learning Technologies</b> Use gaming to enhance learning, especially capturing and analysing information, checking comprehension and authoring materials	Implemented but looking at students using own devices
US	Higher Education	iPhones, iPads, iTouch	<b>Abilene CU “Connected” project</b> Devices distributed to all students and used for wide range of classroom-based and admin	Ongoing
US	School	iPad	<b>Social Studies Digital Curriculum</b> Bespoke mobile curriculum with content, Apps, space for collecting learning and assessments	New
Japan	HE	iPhone	<b>Aoyama Gakuin University</b> Connects students and faculty and links with LMS; collects attendance data via GPS	Ongoing

- 1 Introduction
- 2 **Summary of Main Themes**
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix



- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

## 2.4 Players in the Mobile Education Market

Apple is positioned as poised to change the learning landscape. It manufactures devices, supports content development (apps) and distributes education content through their App Store and especially iTunes U. It has a clear market focus on education, conducting trials, supporting educators and donating used iPads (to Teach for America), and has supported many pilots and successful implementations of Apple devices in the classroom. Apple devices are attractive not only to consumers and learners, but also to the education sector due to their high levels of functionality and value-add and low levels of training, support and maintenance. The iPad especially, increasingly looks like a game changer.

Pearson, a leading global education company, received 29% of their revenues from their digital products and services in 2010. It is the company most capable of delivering an end-to-end service, which brings content to device and sees it through to the assessment stage - the iPad Social Studies Digital Curriculum developed by Pearson for the US State of Virginia delivers exactly that. Pearson has an especially strong focus on content and has converted and developed many native products.

Blackboard, a leading education technology provider, has developed a mobile LMS and a mobile app package, placing them at the forefront of the Mobile Education market – compared to Apple or Pearson, their focus is quite specific, but the Blackboard Mobile product, developed in partnership with Sprint, is seen as *“the most significant product, in terms of a market catalyst.”*<sup>1</sup>

Having had little previous focus on education, Google are entering with the launch of the new Chrome-Book, a cloud-based laptop. It is a potential game changer for education because it lessens the need for 1:1 devices and offers a different business model, which sees devices leased to educational institutions for a \$20 monthly fee in exchange for a supported, updated device.

Other global companies that are developing Mobile Education products and strategies are Sony, Amazon, Microsoft, Barnes & Noble and a number of other leading educational publishers. There are also a growing number of small, innovative players, often partnering with larger players, developing interesting native products i.e. Inkling, Studycell, and GoKnow.

# 3 Background to the Development of Mobile Education

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education**
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

In this section we provide some context about the development of Mobile Education and consider the shape of the Mobile Education ecosystem, including some of the stakeholders at a global level.

## 3.1 e-Education

In the last decade, a consensus about the benefits of ICT in education has emerged, and many countries have developed ICT strategies for education and made large investments in this area. ICT is seen as both a way to drive operational efficiencies and a way to improve teaching and learning. It is also seen as a way of getting closer to the learner.

*“We expect a growing number of classrooms will soon begin to incorporate technology that reflects a more personalised, collaborative, interactive and mobile learning experience.”<sup>1</sup>*

Global education ICT spend was \$64.15 billion in 2010,<sup>2</sup> showing 2.5% growth on the previous year. Education spends a greater percentage of its revenue on technology than other industries – 5.5% of revenues compared to an average of 4.2% in other industries.

ICT in education covers a wide spectrum and is at widely varying stages in different education segments and countries. The main areas of development are:

- Infrastructure development (connectivity and hardware).
- Teacher training.
- Technical support.
- Content development.
- Curricula and pedagogical approaches.



For most developed countries, the infrastructure is in place and progress has been made along most of the other dimensions. The use of e-Administration systems and learning management systems is widespread. There is increasing use of forms of e-Assessment, especially formative assessments and e-Portfolios for gathering evidence and work. Digital tools, such as laptops and interactive whiteboards, are in increasing use in classrooms. Content has made the shift from replicating existing material in digital formats, to creating new types of content that maximise the format and align with curriculum and learning objectives.

Generally, ICT becomes transformative when it begins to change and enhance teaching and learning. A few countries are achieving this to an extent, but many hit a barrier when it comes to making this leap. Some countries that are less developed in terms of more traditional ICT in education might see the potential of going straight to mobile as a way of realising this.

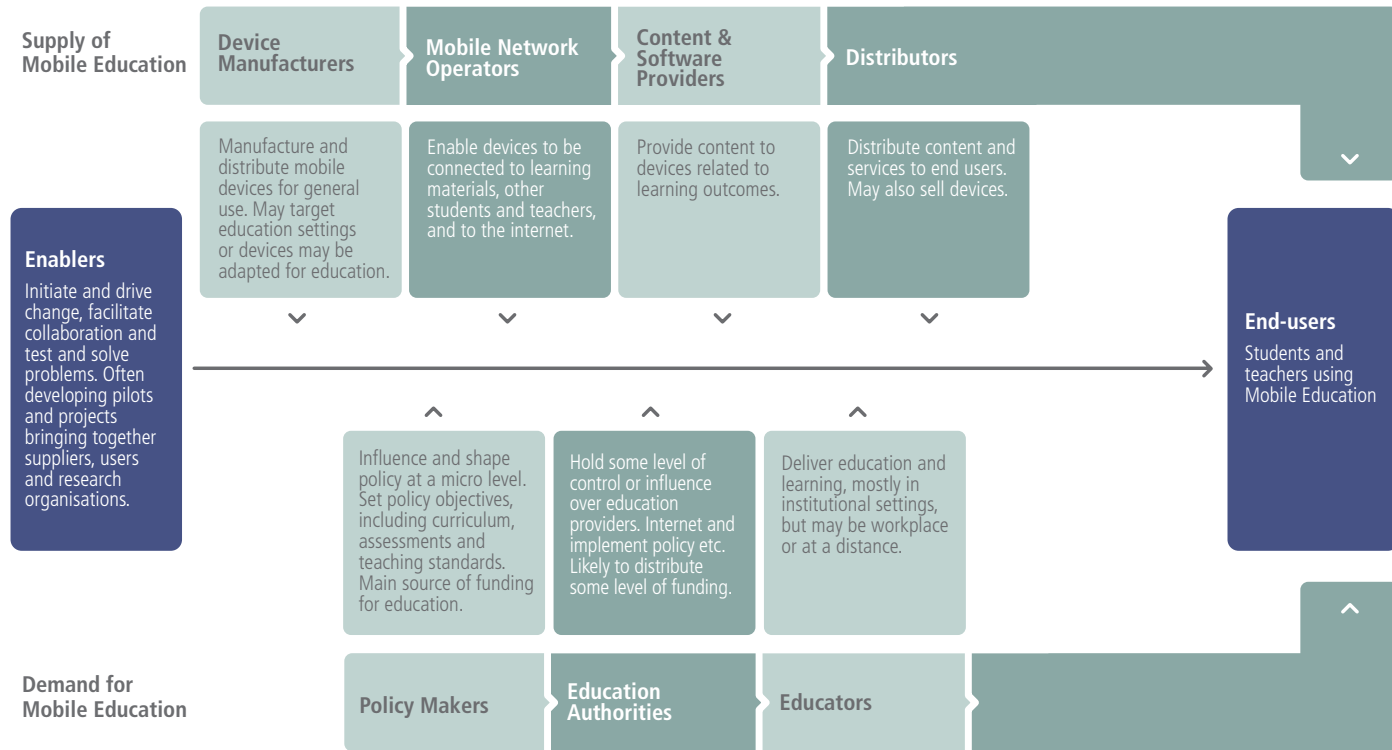
## 3.2 to Mobile Education

Mobile Education takes place when a student uses a portable device, such as a smartphone, netbook or tablet to access content or to interact with other learners, and with teachers. It has the advantages of enabling learning to take place anytime and anyplace and of providing a more personalised and motivating learning experience. The increasing availability of the smartphone, tablets, gaming handsets and other handheld devices is beginning to present a compelling learning platform available to a significant proportion of the education market.

1. Forrester

2. Forecast: Enterprise IT Spending by Vertical Industry Market, Worldwide, 2008-2014, 2Q10 2Q10 Update, Gartner

3.3 Mobile Education Ecosystem



Source: GSMA

- 1 Introduction
- 2 Summary of Main Themes
- 3 **Background to the Development of Mobile Education**
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 **Background to the Development of Mobile Education**
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### 3.3 Supply of Mobile Education

Four types of provision are required to bring together the elements of a Mobile Education offering – the manufacture of devices, the infrastructure, which enables devices to connect, the provision of content and a means of distribution. Each of these may be provided to consumers as a whole or tailored to an education setting or need.

#### Devices

The devices used in Mobile Education are handheld, Internet capable and are carried by most people. Most commonly, they are mobile phones, personal listening devices such as mp3/mp4 players or lightweight, portable computers such as slates, tablets, netbooks and small laptops. e-Book readers are also increasingly common. However the range can include games consoles, digital voice recorders, electronic dictionaries, and assistive technologies for learners with disabilities. Increasingly, the distinction between these devices is blurring due to a high rate of convergence.

New devices designed specifically for educational purposes are also coming to the market.

There was a spike in the sales of smartphones, e-Book readers, and tablets in 2010. It should also be noted that in 2010, Nintendo sold 8.5 million DS devices in the US. In 2011, the market will be flooded with new handheld devices, with several designed exclusively for education.

#### Connectivity Providers

Equally important are the networks and infrastructures, which enable the devices to connect to learning materials, other students or teachers and to the Internet. Increased access to affordable and reliable networks is seen as a significant driver of the growth of Mobile Education.

#### Content Providers

The range of potential content providers is huge and spans small and large companies in a number of education and media segments, government and education organisations and institutions, and even individual or groups of learners and educators, through user-generated content and custom publishing.

Importantly, for use in formal education settings, content must be mapped to some kind of curricula or learning outcome, or educational need.

#### Distribution

Distribution of both devices and content can be through the common consumer or commercial channels, such as Getjar, Amazon, and Opera, or specialist education channels, such as CourseSmart or iTunes U. It can feature special pricing or tailored bundles of products and services for education sector customers.

#### Examples of Players in the Mobile Education Ecosystem

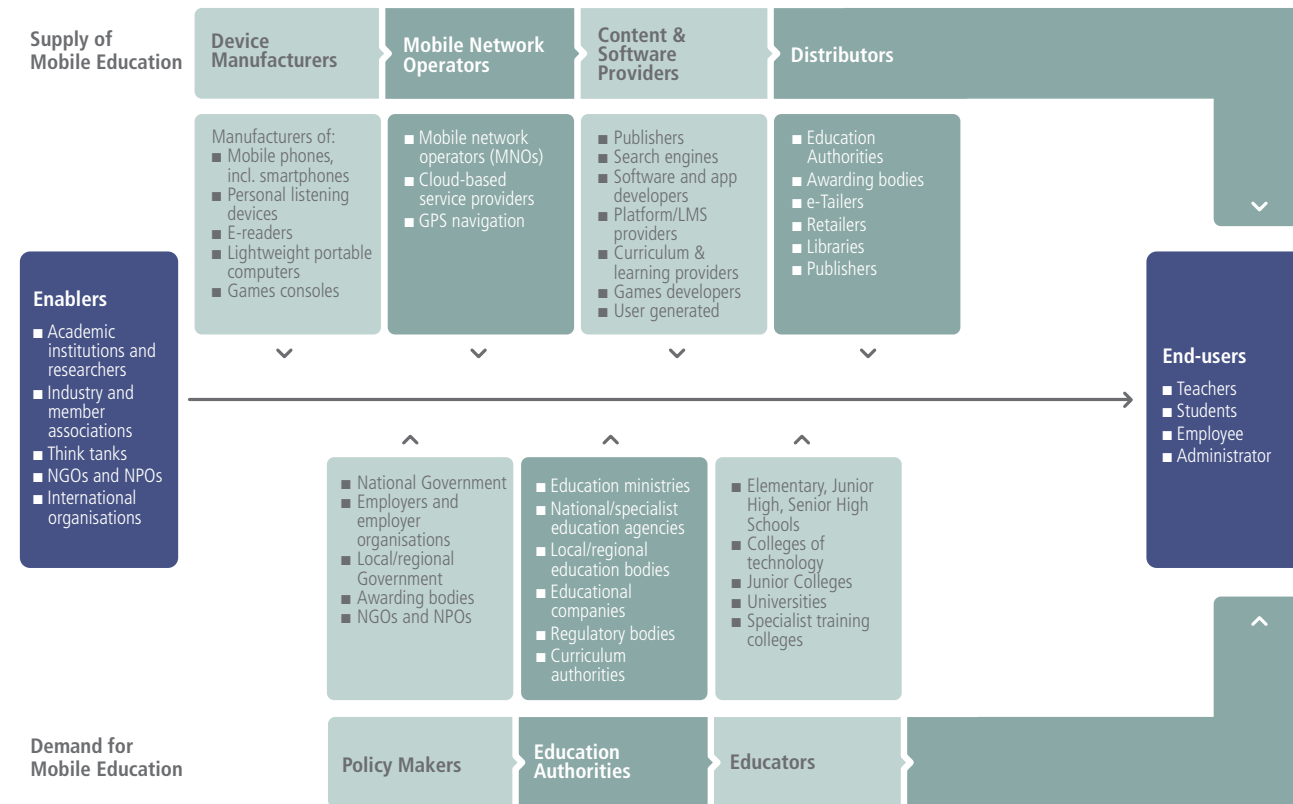
Some of the main types of company across each part of the ecosystem are listed below. They may be global providers or operate in a specific country.

#### Demand for Mobile Education

As our definition of Mobile Education focuses on formal education, demand comes primarily from education institutions, typically schools, colleges, universities, and training providers, and also employers. National or regional governments, or national agencies and education authorities are also considering and implementing Mobile Education.

Increasingly, learners themselves drive demand. Mobile devices are pivotal in students' everyday life and mobile technologies are expected to play a bridging role between informal and formal practices of learning. In higher education especially, students arrive at university well equipped with mobile devices and expecting them to integrate with their learning in the same way they pervade most other parts of their lives. Whilst the 'mobile' tag is more contentious in school settings, institutions are beginning to see that 1:1 devices or use of student's own devices opens up many educational possibilities.

Mobile Education Ecosystem – Types of Stakeholder



Source: GSMA

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 **Background to the Development of Mobile Education**
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### 3.3 Global Stakeholders

As Mobile Education is an emerging market, there is a focus on organisations and initiatives that play an enabling role, promoting discussion, testing the potential, highlighting the benefits, and in some cases, putting in place frameworks and systems to kick-start the market. The main ‘enablers’ and their activities are described here.

#### Supranational Organisations

Most of the key organisations supranational organisations have had programmes in place that support the development of ICT in education for the last decade or so, and have played a significant role in driving change in this area, especially in developing countries.

Mobile Education has emerged as a focus very recently, but is now on the agenda for both UNESCO and the World Bank. The World Bank is currently compiling a research report on the use of mobile phones in education, whilst UNESCO is further down the line with a new policy paper on mobile learning and strategic alliance with Nokia to jointly deliver a small programme of activities.

#### UNESCO

UNESCO pursues global coordination and provides support to achieve the Education For All and education-related Millennium Development Goals on behalf of the international community. ICT in Education has long been a key UNESCO theme, supported by a raft of programmes, resources and initiatives. Strategies mainly focus on embedding ICT in education policy and system-level improvement, with a critical focus on teachers as the main levers of change. In addition, the UNESCO Institute for Information Technologies in Education (IITE) acts as centre of excellence and as a provider of technical support and expertise.

Through the IITE, UNESCO has made a recent and important strategic commitment to mobile learning, which they see as a key enabler in furthering the objectives of Education For All. A policy brief, from December 2010, makes a series of important, if relatively high-level recommendations.

### Recommendations from Mobile Learning for Quality Education and Social Inclusion

#### UNESCO/IITE Policy Brief, November 2010

- Recognize the value of learning in unconventional, informal or everyday contexts and enable learners to realize the full breadth of their potential contributions to society.
- Enable geographically dispersed, disadvantaged learners to become a valuable teaching resource by providing mobile technologies to help them share their local knowledge and expertise.
- Invest in further development of mobile pedagogies that are distinct from e-Learning.
- Fund further research on mobile learning, particularly longer-term and larger-scale studies that are focused on vital educational goals, and those that explore orchestration of out-of-school learning.
- Work with educational institutions to develop workable mobile learning policies.
- Train teachers, to raise awareness, build confidence, and impart new skills and knowledge for the redesign of existing curricula and forms of assessment.
- Reward teachers for becoming life-long and life-wide learners themselves through their personal use of mobile technologies to reflect on their teaching practices and to extend their knowledge.
- Promote and develop innovative donor initiatives to assist with the costs of introducing and sustaining mobile learning among the most vulnerable and underserved populations.
- Work with telecommunications companies to enable more affordable mobile access and Internet browsing.
- Work with publishers of learning materials to develop business models that will allow more flexible and lower-cost or free access, remixing and reuse on mobile devices.

- 1 Introduction
- 2 Summary of Main Themes
- 3 **Background to the  
Development of Mobile  
Education**
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook  
Publishing
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education**
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### Alliance with Nokia

Although the Policy Brief makes no actual commitments, these recommendations align with the objectives of the agreement between UNESCO and Nokia, signed in October 2010, to promote the use of mobile technologies. This is an initial three-year agreement, which will see Nokia invest US\$5-10m in three types of projects:

- Research to identify possible applications of mobile technology, leading to the formulation of guidelines for education ministries and policy-makers in developing countries.
- Targeting teachers, promote the use of mobile technologies to support training and capacity-building, as well as the management of educational institutions, particularly in gathering data on staff, pupils and school facilities.
- Develop new mobile applications with educational potential.

### The World Bank

The World Bank is mainly concerned with education funding, through low-interest loans, interest-free credits and grants to developing countries, including investments in education. It also works on international education policy, country-level analyses, and impact evaluations. It is currently preparing to the final version of a new Education Sector Strategy, and the consultation process to inform the ICT component is underway – we might expect Mobile Education to form some part of this.

As larger ‘mobile flagship’ programme looks at the use of mobile services across several sectors. As part of this, a new study is underway focusing on The Use of Mobile Phones in Education in Developing Countries. The aim is to raise awareness about potential uses of low cost mobile devices - especially mobile phones - to benefit a variety of educational objectives. It will map the existing landscape of initiatives in this area and emerging ‘good practice.’ It is also hoped that this work will serve as a common base for further work in this area, and inform the impending explosion of development of new hardware, software and business services occurring on mobile devices, to the benefit of these educational objectives.

### Corporate Citizenship

A number of large technology providers, notably Intel and Microsoft, Cisco, Oracle, have also very actively driven the development of ICT in education, often donating hardware, running programmes and investing heavily in training of teachers. Introducing technologies to school children and education settings are generous acts of corporate citizenship, but are also clearly a useful way for companies to influence early IT habits. They might be less likely to drive Mobile Education initiatives, but their successful implementations could be a model for mobile operators. One example is the Intel World Ahead programme (see Appendix).



- 1 Introduction
- 2 Summary of Main Themes
- 3 **Background to the Development of Mobile Education**
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### Other Global Activity

Mobile Education is largely an area of debate, fuelled by the wealth of projects and initiatives detailed in this report. This means there is a plethora of academic papers, white papers, conference presentations, and commentary and discussion chains on blogs. It is agenda item for a few international education and technology organisations, such as the Gates Foundation and IADIS. There are also a growing number of conferences focusing on Mobile Education, and more broadly, mobile learning, and at least one international journal - International Journal of Mobile and Blended Learning.

IAMLearn is so far, the only Mobile Education industry organisation, focusing specifically on research, development and application of mobile and contextual learning. It currently tracks 63 mobile learning projects.<sup>1</sup> They also run an annual global conference, the World Conference on Mobile and Contextual Learning. It is a membership organisation, made up mostly of members from institutions and relevant education stakeholders, as well as academics with an interest in Mobile Education and mobile learning.

### 3.4 Global Initiatives

High profile global initiatives focusing on devices have introduced cheap laptops and netbooks, designed specifically for education, to schools. They typically provide a device and a wide-ranging support framework, which enable local implementations, and, although they may find their ambitious early targets hard to meet, they have met with significant success and had a transformative effect in many developing markets. The most high-profile and successful programme is One-Laptop-Per-Child (OLPC), which has distributed XO laptops to more than 1.4 million children in 35 countries. Other examples include Intel's World Ahead Programme, and the more recent Acer-European Schoolnet Educational Netbook Pilot (all described in the Appendix).

OLPC and World Ahead initially focused on laptops, which could be connected to the Internet. In May 2010, OLPC stopped production of their proprietary XO-3 and announced that they would adopt the Marvell device which retails at \$99. OLPC intends to release the Marvell-based OLPC device in mid-2011.

<sup>1</sup> IAMLearn current projects:  
<http://www.iamlearn.org/projects/>

# 4 Market Size and Potential

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential**
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

The use of mobile devices in education is at the early stages of development, so the Mobile Education market can only be described as emerging.

## 4.1 Market Size

As yet, there is little published market data on Mobile Education for the formal education sector but the broader mobile learning market in the United States is quantified (by Ambient Insight). The US market for mobile learning products and services reached \$958.7 million in 2010, and is estimated to reach \$1.82 billion by 2015<sup>1</sup>. Boom areas are driven by consumers, purchasing Edugames, especially brain trainers, and device embedded learning products for young children, and healthcare buyers, purchasing handheld decision support and mobile continuing medical education by healthcare students and clinicians.



Using a very crude assumption of 20% global market share for the US in 2010 (guided somewhat by other figures released by Ambient and listed below), we might imagine a global market size for mobile learning approaching \$5 billion.

Formal education (preK-12 and higher) is just one of the consumer segments of mobile learning – others are consumers themselves, corporates, government, non-profits and associations, and healthcare. Slightly older data, for 2009, breaks out expenditure within preK-12 and HE in the United States, giving a figure of \$168 million in 2009. The 12.8% CAGR implies a 2011 value of \$213.8 million,<sup>2</sup> projected to reach \$308 million by 2014.

Table: Mobile Education Segments in Relation to Mobile Learning Markets, 2009-2014,<sup>3</sup> \$m

Segment	2009	2011 (e)	2014 (e)	CAGR
PreK-12	70.90	93.9	143.3	15.1%
Higher Education	96.87	120.9	164.7	11.7%
<b>Total Education</b>	<b>167.77</b>	<b>213.8</b>	<b>308.00</b>	<b>12.9%</b>
Other Buying Segments	464.43	671.0	1,156.8	20.0%
<b>Total Mobile Learning</b>	<b>632.2</b>	<b>884.8</b>	<b>1,464.8</b>	<b>18.3%</b>
<b>Formal Education as % of total</b>	<b>26.5%</b>	<b>24.2%</b>	<b>22%</b>	

<sup>1</sup> The Horizon Report – 2011 edition, New Media Consortium and Educause, <http://www.nmc.org/pdf/2011-Horizon-Report.pdf>

<sup>2</sup> The US Market for Mobile Learning Products and Services: 2010-2015 Forecast and Analysis, Ambient Insight

The figures for formal education exclude many key elements of the full Mobile Education ecosystem, such as the cost of devices and infrastructure investments, such as increased bandwidth or development of virtual servers, and the cost of network tariffs and traffic.

According to Ambient, the US is the top consumer of mobile learning, followed by Japan, South Korea, the UK, and Taiwan, representing 70% of the total 2010 global mobile learning market. The position of Japan, South Korea and Taiwan are boosted by the huge penetration of informal types of learning on mobile devices in these markets. This dynamic is changing fast and other consumers are emerging. By 2015, these five countries will only account for 40.6% of all expenditures. The highest growth rates are in China, India, Indonesia, and Brazil. By the end of the forecast period, China will be the second largest buying country after the US.

#### 4.2 Market Potential

Despite these initially modest figures around market size, there is a great deal of enthusiasm around Mobile Education. To give some examples:

- The annual Horizon Report, which describes emerging technologies in education, has identified mobile computing and e-Books as a key technologies to watch in 2011 on the near term horizon (next 12 months).<sup>1</sup>
- Gartner predict that mobile learning will become part of mainstream education, driven by consumer demand, new technologies and services, and the evolution of learning styles.

*The OECD points to a "potentially massive area of investment by ministries of education, civil society and [especially] the private sector in the decade to come." Ambient Insight states that "Clearly the market conditions are favourable for creative Mobile Learning suppliers. There are distinct and lucrative revenue opportunities in the market," but couch this with a warning that "the competition is now intense and suppliers need to understand the complex dynamics of a product in a value creation phase."*<sup>2</sup>

- Nokia believe that "In education, mobile technology is a great enabler for empowerment. We believe that as a society we have barely scratched the surface of what mobile communications can achieve. Through cooperation with UNESCO we can accelerate the transformation that mobile communications can bring to the availability and quality of education especially in developing countries." Esko Aho, Executive Vice President, Nokia.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential**
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

1 The Horizon Report – 2011 edition, New Media Consortium and Educause, <http://www.nmc.org/pdf/2011-Horizon-Report.pdf>

2 The US Market for Mobile Learning Products and Services: 2010-2015 Forecast and Analysis, Ambient Insight

# 5 Key Players in the Mobile Education Market

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

In this section, the aim is to examine some key global players, especially technology and online players, and identify how they might fit into a Mobile Education. It is not intended to be exhaustive, but to give a sense of how companies are responding to the Mobile Education challenge at a global level.



## Amazon

Amazon sells books and a range of other products and services to customers via consumer-facing websites. It also manufactures and sells the Kindle e-Reader. Revenue is mainly from the sale of products and services to consumers.

*“We believe that one day students could read all their schoolbooks on Kindle and that in doing so, will have an even better experience,”*  
Cinthia Portugal, Amazon spokeswoman.

### Amazon's Strategic Focus in Mobile Education

Mobile Education Ecosystem	Strategic Focus	Activities
Device Manufacturer	Medium to High	<ul style="list-style-type: none"> <li>■ Kindle e-Reader.</li> <li>■ Kindle DX – positioned for academic/e-Textbook market:                             <ul style="list-style-type: none"> <li>– Larger display format, pdf reader and more capacity.</li> <li>– Other features include the ability to take notes and highlight, search across their library, look up words in a built-in dictionary.</li> <li>– Initial Amazon-led trials in 6 US colleges and universities.</li> <li>– Number of other institutions making Kindle DX devices available to students or in the process of trials.</li> </ul> </li> </ul>
Service and Content Provider	Low	<ul style="list-style-type: none"> <li>■ Amazon Web Service – cloud-based infrastructure web services platform. AWS in Education targets the academic community.                             <ul style="list-style-type: none"> <li>– On-demand infrastructure teach courses, conduct research and explore new project.</li> <li>– Self-directed learning resources for students.</li> <li>– Free usage credits for educators, academic researchers, and students.</li> </ul> </li> </ul>
Distributor	High	<ul style="list-style-type: none"> <li>■ Leading textbook publishers Cengage Learning, Pearson, and Wiley (60% of US HE textbook market), offering textbooks through the Kindle Store:                             <ul style="list-style-type: none"> <li>– Textbooks are “leased”, not “bought” by readers.</li> <li>– Amazon allows publishers to determine the specific ways in which their textbooks may be used by students and educators.</li> </ul> </li> <li>■ Blackboard Building Block for e-Readers supports Kindle:                             <ul style="list-style-type: none"> <li>– Allows users to download books, blogs, magazines, and newspapers electronically into BlackBoard.</li> <li>– Offered free under an open source license.</li> </ul> </li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix



## Apple

Apple designs, manufactures and markets personal computers, mobile communication and media devices, and portable digital music players. It also sells software, services, peripherals, networking solutions, and third-party digital content and applications. The company is focused on expanding its market opportunities related to mobile communication and media devices.

Apple has a clear and long-standing focus on education and positions its products as meeting the educational needs of learners.

Apple focuses on just a few 'game-changing' devices and distribution channels. Their products and services are compelling and impactful and their brand power is great. The iPad in particular, is positioned by Apple, and perceived more widely, as poised to change the learning landscape.

The inherent features of iPad functionality adapt well for the needs of education. This includes apps for education, access to iTunes U, access to iBooks and use of iWork productivity tools to put together documents, presentations, and spreadsheets. In addition, video mirroring (and an adapter) enables an HDTV or HD projection screen to become a bigger version of an iPad. Students can see the iPad display, including each tap and swipe, and be taught using educational iPad apps, movies, videos etc.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix



Apple's Strategic Focus in Mobile Education

Mobile Education Ecosystem	Strategic Focus	Activities
Device manufacturer	High	<ul style="list-style-type: none"> <li>■ MacBook.</li> <li>■ iPad.</li> <li>■ iPhone.</li> <li>■ iPod Touch.</li> <li>■ Many tools and features of products adapt well to educational needs e.g. iLife digital authoring tool on MacBook, iWork on iPad.</li> <li>■ Learning Labs - cabinets housing multiple devices in classrooms.</li> </ul>
Service and Content provider	Medium	<ul style="list-style-type: none"> <li>■ Educational apps - thousands focusing on learning and education:                             <ul style="list-style-type: none"> <li>– Most used in informal settings.</li> <li>– Curriculum guides map the apps to areas of the US curriculum.</li> <li>– Other types of app help student or teachers organise for learning – track assignments, take notes, and study for finals and teachers can give lessons and monitor progress.</li> </ul> </li> </ul>
Distributor	High	<ul style="list-style-type: none"> <li>■ Educational app section in App Store and new Special Education section introduced in Oct 2010.</li> <li>■ Volume purchasing plan available for educational apps, giving educational institutions discounts for bulk purchases.</li> <li>■ iTunes U - designed for and aimed exclusively at education:                             <ul style="list-style-type: none"> <li>– Offers users public access to content from world class institutions.</li> <li>– Currently 350,000 content items, ranging from lectures and presentations to syllabi and campus maps.</li> <li>– All content is free and can be accessed via a Mac or PC, or wirelessly downloaded onto iPhone or iPad.</li> <li>– University sites can be managed to give public access and internal access.</li> <li>– 800+ universities have active iTunes U sites, with nearly half distributing their content publicly.</li> <li>– 300m+ downloads.</li> <li>– One of the world's most popular online educational catalogues.</li> </ul> </li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix



- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

There are a wide range of educational reasons why the iPad is increasingly recommended for use in formal educational settings:<sup>1</sup>

- Light and portable, easily carried in the school bag and to and from class.
- Potential to replace heavy schoolbooks with e-Books.
- Instant start-up of the iPad means greater use of class time for learning.
- 10 hour battery life so can be used throughout the entire school day.
- Seen to be an intuitive device requiring minimal technical support.
- Touch interface is familiar and allows a high level of interactivity.
- Use of different apps helps users choose different ways to build and demonstrate their understanding, or pursue areas they are interested in learning about.
- Notes can be kept, commented on and made available. Texts and documents can be annotated and commented on by multiple students and teachers.
- 'Anywhere, anytime' access to current information.
- Information is represented with rich multimedia and data visualisation techniques.
- Can be used with peripherals e.g. the iPad can be slotted into a case which connects to a full size keyboard for extended periods of writing. There are also a number of other docking options which provide access to a full sized keyboard.
- Voice recognition apps can also be useful for inputting large amounts of text.

Many schools, colleges and universities have begun experimenting with the Apple devices, varying from campus-wide distributions to small-scale, single-class pilots. There are lots of examples of this, mostly initiated and supported at an institution level. Examples include:

- Escondido Union School District's iRead project which uses iPod Touch to improve student comprehension and reading (see case study in US section).
- Ohio State University using iPod Touch initially for podcasting of lectures, and then a much wider range of activities (see case study in US section).
- Recent UK school roll-outs:
  - Cedars School of Excellence, Greenock, Scotland - conducting all lessons on iPads and declaring itself the world's first 'iSchool'.
  - 1,500 iPads in Essa Academy, Bolton (1 per teacher and student).
  - 1,500 iPads in Longfield Academy, Kent.
- Stanford University School of Medicine - distributing iPads to their medical students as part of a trial programme to integrate the mobile device into education.
- Seton Hill University, Pennsylvania – providing incoming freshman with an iPad.
- Reed College, which tested Kindles in the classroom in fall 2009, has been testing the iPad for reading this year in a parallel experiment.
- Scottsdale Community College - journalism students using iPads for research and to record personal interviews.

Although a trial, the 'iPads for Learning' project for schools in Victoria, Australia differs in that it is initiated, funded and supported by the state education agency. Over 700 iPads have been distributed to students at nine selected schools in primary, secondary, and specialist settings. They are set up with a suite of specially selected apps to complement existing technologies and programmes already used by Victorian schools, some of which are supported by ideas for classroom activities. Students use their iPads with wireless Internet access at school, and at home with or without Internet access. Students can load their own apps onto the iPad. It will be interesting to see if this is adopted more widely across the State.

<sup>1</sup> Victorian Department for Education and Early Childhood Development <http://www.ipadsforeducation.vic.edu.au/why-ipad/ipad-features>



### Barnes & Noble

Barnes & Noble is the largest book retailer in the United States, with a multi-channel distribution platform. It is currently the only enterprise to

offer readers the option of store visits, e-Commerce, and digital delivery of books to Barnes & Noble-branded devices or other devices of their choosing.

#### Barnes and Noble's Strategic Focus in Mobile Education

Mobile Education Ecosystem	Strategic Focus	Activities
<b>Device Manufacturer</b>	Medium to High	<ul style="list-style-type: none"> <li>■ Nook – e-Book reader based on Android platform with Wi-Fi. B&amp;N admit Nook is not designed to be an e-Textbook reader.</li> <li>■ Suggestion of B&amp;N College digital platform in pipeline?</li> </ul>
<b>Service and Content Provider</b>	Medium	<ul style="list-style-type: none"> <li>■ NOOK study targets HE students and aims to “enhance the academic experience through unique and customizable study features” .</li> <li>– Free software suite for the PC and Mac which allows students to download and organise e-Textbooks, lecture notes, syllabi, slides, images, and other course-related documents.</li> <li>– Will incorporate textbook discounts and test preparation.</li> <li>– No indication a yet that this will be a mobile platform.</li> <li>■ Sparknotes – study aid website and publishing company.</li> <li>– Internet study materials, test preparation guides, video tutorials, advice columns and book, music and web page recommendations.</li> <li>– Captures one of the highest online concentrations of students from ages 13-24; more than 10 million unique users and 100 million page views each month.</li> <li>■ Tikatok – online publishing platform for parents and children.</li> <li>– Write, illustrate, and publish stories into hardcover and paperback books.</li> <li>– Uses patent-pending StorySparks™ system, which helps to walk children through the process of creating and writing stories.</li> </ul>
<b>Distributor</b>	High	<ul style="list-style-type: none"> <li>■ Barnes&amp;Noble@School – online channel, with educator discounts.</li> <li>■ B&amp;N College – 637 college bookstores serving nearly 4 million students and faculty members (14% of sales).</li> <li>– Plans to offer e-Textbooks and other course materials through a proprietary digital platform.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

**Blackboard**

Blackboard is a leading education technology provider, implementing learning platforms and services in schools and post-secondary education institutions, mainly in the United States. Customers include colleges, universities, schools and other education providers, textbook publishers, student-focused merchants, and corporate and government clients.

Mobile Central has been cited as “the most significant product, in terms of a market catalyst.”<sup>1</sup> It is a “native application” for a particular college or University (as opposed to a set of web pages) that allows staff and

students to access content from their courses and organisations. The list of supported devices includes iPhone, iPad, iPod touch, Android, BlackBerry, and Palm smartphones.

After it is enabled, the application is free to students, faculty, prospective students, parents, alumni and anyone else interested in staying connected to an institution, and can be downloaded from smartphone app stores. With the app, users can navigate campus maps and course catalogues, event calendars, campus news, sports schedules, and even a campus directory that allows users to call or email professors and classmates directly from the app.

**Blackboard’s Strategic Focus in Mobile Education**

Mobile Education Ecosystem	Strategic Focus	Activities
Device Manufacturer	Low	<ul style="list-style-type: none"> <li>Focus is on supporting devices already in the market including iPhone, iPad, iPod touch, Android, BlackBerry, and Palm smartphones.</li> </ul>
Services and Content Providers	High	<p>There are four key platforms to support Mobile Education:</p> <ul style="list-style-type: none"> <li>Blackboard Learn (web-based teaching and learning platform).</li> <li>Blackboard Transact (commerce and security solutions).</li> <li>Blackboard Connect (alert and notification platform pushing voice calls, email, text and SMS messages to up to nine contact points).</li> <li>Blackboard Mobile (comprehensive mobile platform designed to deliver campus life services, resources and content to mobile devices).</li> </ul>
Distributor	High	<ul style="list-style-type: none"> <li>Partnerships Programme with hundreds of technology and content partners distributing through Blackboard into K-12 and HE.</li> <li>Blackboard Extensions - online catalogue for Blackboard platform integrations created by the Blackboard community and partners. Also includes digital content and assessments offered by professional content providers.</li> <li>Blackboard Content Network for users and content providers to share teaching and learning experiences to share teaching and learning experiences.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

## Google

Google is a global technology leader focused on connecting people with information. Customers are users, advertisers and content providers. Advertising is the main source of revenue (96% in 2010). Within the Mobile Education ecosystem, Google play an important general (but not education specific) role as device manufacturer's (Android), content providers and distributors.

Google's activities in education include an education section in the Google Apps Marketplace, a resources portal, Google for Educators, and a Google Teacher Academy which funds and delivers workshops aimed at computer science teachers.

The recent announcement of the launch of the Google Chrome-Book could increase Google's impact in the education sector. The product, launched in June 2011, is WiFi enabled and is intended for working in the cloud. This means that a user's tools and content are no longer tied to a device, but sitting in the cloud and are accessible from a Chrome-Book or mobile device.

The business model, will see Google lease Chrome-Books to customers. They will pay Google a monthly fee in exchange for a supported, updated Chrome-Book. Given that one Chrome-Book can serve multiple students, this could be an attractive offer for educational institutions.

This is an opportunity for institutions that may not wish to purchase hardware and software and administer the ongoing flow of updates, patches and technical support.

Google's Strategic Focus in Mobile Education

Mobile Education Ecosystem	Strategic Focus	Activities
Device Manufacturer	Medium	<ul style="list-style-type: none"> <li>■ Android - built with the web in mind – has potential to be a game changer for Google.</li> <li>– May soon come to prominence with the launch of the Chrome-Book which is a range of cloud-based tablets using the Android operating system.</li> </ul>
Service and Content Provider	High	<ul style="list-style-type: none"> <li>■ As a large on-line player Google:                             <ul style="list-style-type: none"> <li>– Maintains a vast index of websites and other online content.</li> <li>– Improves users' access to Google through mobile devices.</li> <li>– Is developing mobile-specific search technologies including search by voice, search by sight, and search by location.</li> <li>– Is optimising Google's applications for mobile devices in browser and downloadable form.</li> <li>– Enables others to innovate in mobile space.</li> </ul> </li> <li>■ Digitised content is key part of strategy, including Google Books.</li> <li>■ Google Apps builds web applications, e.g. Gmail, Google Calendar, Google Docs, mainly focusing on commercial users.</li> <li>■ Education focus:                             <ul style="list-style-type: none"> <li>– Google for Educators -brings together resources and other type of supports aimed at teachers and educators, including tools for educators, classroom activities, a Google Teacher Academy.</li> <li>– Fund and deliver workshops aimed at high school and middle school computer science teachers in the US, Canada, Europe, Middle East and Africa.</li> </ul> </li> </ul>
Distributor	Medium	<ul style="list-style-type: none"> <li>■ Adding a new category for education-related software to its Apps Marketplace, prompted by what it considers the success of its apps for e-Education collaboration and communication suite.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

**Microsoft**

Microsoft develops, manufactures, licenses, and supports a wide range of software products and services for many different types of computing devices. Education is one of many target markets for Microsoft and they have a series of education specific products and services. They also provide free resources and support to schools and the education sector, in part with the aim of introducing their products to students who are beginning to form online habits.

Windows Phone is expected to grow market share and become the second most common smartphone operating system, accounting for more than one in five handsets by 2015.<sup>1</sup>

Microsoft also have a partnership in place with QTel (announced February 2010) to promote mobile learning in the Middle East, targeting schools, universities and technical colleges. It aims to bring together integrated cloud-based services, software applications, mobile services and devices over QTel’s converged network. It is expected to start with mobile e-learning pilot projects in Kuwait, Qatar and Oman aimed at providing students and teachers with the ability to easily communicate, collaborate and access various educational services, using solutions including Windows Phone and the Windows Live platform.

Additionally, Microsoft supports the use of technology more broadly as an accelerator to help transform education through a range of acts of corporate citizenship, philanthropy and public/private partnerships. Among these are Unlimited Potential, Schools for the Future, and Partnerships for Education. In this capacity, they also have the potential to overlap into the ‘enabler’ role in the Mobile Education ecosystem, although these efforts currently do not focus on mobile learning.

Microsoft’s Strategic Focus in Mobile Education

Mobile Education Ecosystem	Strategic Focus	Activities
Device Manufacturer	Medium	<ul style="list-style-type: none"> <li>■ Windows Phone.</li> <li>■ Xbox games console.</li> <li>■ Early research into pen-based learning (Microsoft Research Asia).</li> </ul>
Service and Content Provider	High	<ul style="list-style-type: none"> <li>■ Bundle Microsoft products to meet needs of education, including teaching tools, managing student information, maintaining IT infrastructure, secure environments, creating a student or staff portal, meeting reporting requirements or collaborating.</li> <li>■ Live@edu provides hosted email, online storage, communication and collaboration services, to schools and colleges directly, currently for free. Over 10,000 schools and 15 million students and administrators, in over 100 countries, are signed up.</li> <li>■ Office 365 for education will be as successor to Live@edu. Cloud-based productivity and will work across platforms and devices, including tablets, smartphones or other mobile devices.</li> <li>■ Deliver some free content to educators as supplement to core product offerings i.e. classroom resources on the Microsoft Education website and Microsoft Partners in Learning, which provides resources and tools to over 4 million educators.</li> </ul>
Distributor	Low	<ul style="list-style-type: none"> <li>■ Microsoft’s partners are the active distributors of their software to educational institutions.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

## Pearson

Pearson is an international media and education company focusing on the education, business information and consumer publishing markets. They deliver content in a variety of forms and through a variety of channels, including books, newspapers and online services. Though they operate in more than 70 countries, their largest market is the US (59% of sales).

Pearson Education is a leading provider of educational materials and learning technologies. It provides test development, processing and scoring services to governments, educational institutions, corporations and professional bodies around the world. It publishes across the curriculum and provides a range of education services including teacher development, educational software and system-wide solutions. Pearson's other primary businesses include the Financial Times Group and the Penguin Group.

Pearson has made a significant shift from a 'traditional' to a digital based business model, to the extent that digital revenues have reached 29%. The digital strategy focuses on *"adding services to our content, usually enabled by technology, to make the content more useful, personal and valuable."* Further detail about Pearson, particularly activities relating to e-Books, is in the next section on textbook publishing.

Pearson is a key player in the global Mobile Education ecosystem. They are clearly focused on this market, and moreover, are rooted in both the supply side, described here, and on the demand side (they own awarding bodies (notably Edexcel), run assessments (SATS, among others) and own a small number of schools.

Pearson seem to currently have a focus on the iPhone and especially the iPad as their route to the mobile learning market.

Pearson plays the role of enabler, through The Pearson Foundation. With other partners (including Nokia), they cooperate on the BridgeIT programme, which combines existing mobile products and satellite technologies to deliver digital, multimedia materials to Bridge Schools. The Pearson Foundation is also a partner in Quest to Learn, a public school in New York, which focuses on learning through digital media and games.

Pearson's Strategic Focus in Mobile Education

Mobile Education Ecosystem	Strategic Focus	Activities
Device Manufacturer	Low	<ul style="list-style-type: none"> <li>■ No devices manufactured, but iPhone and iPad seems to be target device for Pearson.</li> <li>■ Investment, with McGraw-Hill, in InKling which will transform key titles for iPads. Initially 14 titles, but plans to ramp up by the end of the year.</li> <li>■ e-Pen, developed with Destiny, a market leader in mobile workforce solutions, is a low-cost, digital pen for use by assessors in the field.</li> </ul>
Content Provider	High	<ul style="list-style-type: none"> <li>■ Created more than 100 apps for learners of all ages.</li> <li>■ Mobile MBA app (new) – content in the form of 11 'skill-pills' supported by Live 360' tool that enables users to get ongoing live feedback from their colleagues.</li> <li>■ PowerTeacher Mobile – for the iPad (part of PowerSchool LMS). Allows teachers to record student scores and make observations about progress.</li> <li>■ MyMathLab®, MyStatLab™ and MathXL® - online courses that integrate interactive multimedia instruction with textbook content – 9m students in 2010.                             <ul style="list-style-type: none"> <li>– Mobile dashboards available as apps for iPhone, iPad and Android.</li> <li>– Students log in and review information on their courses.</li> <li>– Designed to help study habits rather than allow students to complete assignments on their mobile devices.</li> </ul> </li> <li>■ iPad social studies curriculum (announced Sept 2010):                             <ul style="list-style-type: none"> <li>– Collaboration between the State of Virginia and Pearson – part of their Beyond Textbooks initiative.</li> <li>– Complete social studies curriculum for the iPad.</li> <li>– Four iPad apps plus digital curriculum aligned to the Virginia editions of Pearson's U.S. History and World History programmes for 7th and 9th graders.</li> <li>– Pilot in several schools for 12 weeks beginning November 1st 2011.</li> </ul> </li> </ul>
Distributor	High	<ul style="list-style-type: none"> <li>■ CourseSmart – leading the shift to e-Textbooks. Joint venture with Cengage, McGraw-Hill, Wiley.                             <ul style="list-style-type: none"> <li>– Delivers 14,000+ e-Textbooks and e-Resources - 90% of core higher education textbooks - to a common platform for laptops.</li> <li>– CourseSmart App for iPads and iPhone.</li> </ul> </li> <li>■ MobileDu - joint venture with Nokia in China. Provides English-language learning materials from a variety of content providers, directly to mobile phones.                             <ul style="list-style-type: none"> <li>– 20m+ subscribers, 1.5m active users each month.</li> <li>– Business growing at 400% a year.</li> </ul> </li> <li>■ Safari Books Online – digital library for technology, creative and business professionals. Access on e-Readers, mobile devices and beta-testing iPad app - "We know there is a market there for computer book content on mobile devices, and the iPhone is our current target". Mark Taub, editor in chief at Pearson Education.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

**Sony**

Sony manufactures audio, video, communications and information technology products. The main target are the global consumer and professional markets, but they are also positioning their products for use in the education sector, where they see huge potential for games consoles as mobile learning platforms in schools.

*“Consoles don’t just play games – they are sophisticated media players. There is no reason why you can’t play open standard educational content such as video, audio and web-based lessons through a games console such as PlayStation3. And it’s not just video games its richer content too – including flash and audio. I think there is a great case for a National Digital Curriculum to complement the existing curriculum.”*Ray Maguire, MD Sony Computer Entertainment.

Sony is looking to deploy devices developed for consumer markets in classroom settings, actively supporting this with product developments, exciting content and classroom-oriented projects. A good example is the PSP game, Second Sight, mentioned above, which is a pilot developed with Cambridge University Press using Shakespeare texts.

*“It takes traditional text and re-energize it with rich media on a standard consumer games based device like a PSP ...to encourage and enhance students’ desire to read printed materials like books.”*John Pettigrew, CUP.

In the UK, Sony is targeting the school sector, with an ongoing push to get PlayStation consoles used as a mobile learning platform in schools. They say PSPs have been purchased and are used extensively in ‘hundreds of’ UK educational and training institutions. They also take a very active role in promoting the debate on the use of technology in the classroom.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

Sony’s Strategic Focus in Mobile Education

Mobile Education Ecosystem	Strategic Focus	Activities
Device Manufacturer	High	<ul style="list-style-type: none"> <li>■ Games consoles – Playstation and PSP (portable).</li> <li>■ e-Book readers.</li> <li>■ Mobile phone handsets, accessories, services and applications through Sony Ericsson (50:50 jv).</li> </ul>
Content Provider	High	<ul style="list-style-type: none"> <li>■ Benefit from teachers adapting and using Sony content (i.e. games) in the curriculum, but also support this with teacher packs and resources:                             <ul style="list-style-type: none"> <li>■ Second Sight for PSP – an augmented reality device targeting education sector.                                     <ul style="list-style-type: none"> <li>– Enables teachers to blend use of established text books, display materials and audio visual content in the classroom.</li> <li>– Comprises a PC based content creation suite and a Second Sight viewer application for the SONY PSP.</li> </ul> </li> <li>■ Educational games, tied to curricula and supported by teaching resources, including:                                     <ul style="list-style-type: none"> <li>– LittleBigPlanet – supported by teacher pack and materials to help teachers create curriculum based levels (May 2011).</li> <li>– Buzz! The School Quiz – developed with UK DfES - 5,000 questions are based on the Key Stage 2 curriculum for children aged 7-11 years.</li> </ul> </li> <li>■ Sony Virtuoso – digital language lab software:                                     <ul style="list-style-type: none"> <li>– Delivers rich multimedia files in audio, video, text and internet to students in a dedicated PC suite, across PC network or wirelessly.</li> <li>– Used in UK and US schools, colleges and universities.</li> </ul> </li> </ul> </li> </ul>
Distributor	High	<ul style="list-style-type: none"> <li>■ ConnectED – specialist education distribution channel in the UK:                             <ul style="list-style-type: none"> <li>– Supports teachers on how to make use of Sony products and content.</li> <li>– Special pricing structure for education for consoles and content, based on volume purchases, which includes online support on the practice and pedagogy of using PlayStation in education.</li> </ul> </li> </ul>

### Other Players

There are many more companies with a global reach that are dipping or expanding into the Mobile Education ecosystem. It is not possible to describe them all here, but it is helpful to acknowledge the extent and potential of these companies to have an impact.

In addition, dozens of native tools and platforms are emerging. Suppliers are marketing tools and technologies designed from the ground up to develop and manage Mobile Education. Examples include products from Media-X, SageMilk, Emantras, Irynsoft, Blackboard, Spaced Education, Achieve Labs, TATE, Alion, and Alelo (to name a few.) Many partner with global content providers, who are able to give them content and market access.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the  
Development of Mobile  
Education
- 4 Market Size and Potential
- 5 Commercial Players**
- 6 Textbook and e-Textbook  
Publishing
- 7 Appendix



# 6 Textbook and e-Textbook Publishing

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

Following on from our broad survey of commercial players in the Mobile Education ecosystem, this section considers the market for textbooks, looking in particular at how the traditional textbook publishing market is adapting to digital delivery and mobile devices.

## 6.1 Traditional Textbook Markets

### Products

At present textbook publishers essentially create four types of products:

- **Print** includes all textbooks, and print ancillaries such as workbooks, manuals and study guides. Designed for traditional classroom use.
- **Custom** for large US state adoptions publishers will produce custom versions of print products, also produce custom content for individual faculty. These are lucrative multi-year contracts, and have no used book market.
- **Digital** usually two forms of digital product: homework management and e-Books. Homework management systems (MyLabs, CengageNow, WileyPlus, Connect) are bundled with textbooks for an additional charge and are part of an 'up sell' strategy.
- **Alternative (discounted) products** some publishers have tried to produce lower end print products, such as a magazine format.

The question facing the publishing industry, and explored in part here, is how digital products will impact on their business, production and marketing models.



### Provision

The model of textbook provision and therefore the resulting commercial market varies between countries and states and also between education sectors. Mostly, in TVET and higher education the choice of textbooks is left with the academic faculty, drawn from freely produced commercial texts. The students are then responsible for purchasing or accessing the recommended texts.

In schools, the state often plays a greater role. In some countries, such as France, Germany and some US states, there is state control over the content of the individual textbooks and which books are used in classrooms, whereas in others, like the UK and Australia, there is free teacher choice and an open commercial market. The table below highlights some of the differences in text book provision.

Table: Comparison of Textbook Provision in Schools

Country	Text Book Production	State List of Approved Books	Choice of Book in Class	Textbook Provision
<b>Australia</b>	Mostly commercial	No	Teacher's choice	Parents buy or pay levy to school to hire
<b>Canada</b>	Commercial (by approval). Provinces produce and pilot books	Provinces provide recommended list of approved titles	District or school from approved list	Schools provides
<b>France</b>	Commercial (state approved)	State prescribes content and format, provides recommended list	Teachers from approved list	School provides
<b>Germany</b>	Commercial (Länder approved)	Länder prescribes content, format and cost, provides recommended list	Teachers from approved list	School provides (on loan)
<b>Italy</b>	Commercial	State issue guidance on costs and updates, but does not prescribe or approve	Council of teachers – free choice	Provided by schools at primary level, parents buy at secondary level
<b>Japan</b>	Commercial (state approved) and state produced	State approved list	Local boards or head teacher from approved list	Students receive new books free each year
<b>Netherlands</b>	Commercial	No	Teacher's choice	School provides at primary, parents buy at secondary level
<b>New Zealand</b>	Commercial and State	No	Teacher's choice	School provides
<b>Spain</b>	Commercial (state approved)	Regional/local education authority provides recommended list	Teachers usually from recommended list	Parents usually buy
<b>United Kingdom</b>	Commercial	No	Teacher's choice	School provides
<b>United States</b>	Commercial	~ Half of states recommend – 'adopt' textbooks	Teacher's choice (from approved list if there is one)	In most states schools provides, in others there is a charge

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

### Textbook Publishing in the United States

The United States has an established process for 'adopting' textbooks in schools, by which states select the list of approved textbooks for schools. They follow 'adoption cycles', whereby the state education boards adopt programmes of books about every five years and provide funding to schools for the purchase of them. The publishers will therefore renew its content in line with this cycle. For schools the development phase of new editions or programmes can be up to 24 months.

More than half of states, including some of the largest such as Texas and California, have an adoption policy in place and significant textbook budgets - the Texas State Board of Education spends in excess of \$600 million annually on its central purchasing of textbooks. The significant financial returns from a textbook being 'adopted' means that the commercial industry focuses on these states and organises themselves around their adoption cycles. Open territory states are states that do not follow adoption calendars.

Higher education in the United States follows a similar pattern, with colleges and professors typically refreshing their courses and selecting revised programmes on a regular basis, often in line with the release of new editions or new technology offerings. This cycle has also tended to be about five years, and the publishers will take between 12-18 months to develop their offerings before the renewal dates.

The textbook market in the United States is a source of much controversy and even protest. It has been described as a 'broken market' because the end-consumer (the student) does not usually select the product, while the selectors – the faculty – do not buy the product. This often means that price does not play an important role in the buying decision, leading to claims that the publishers have a disproportionate power to set high prices.

Students bear the burden of high prices, spending an average of \$900 a year on textbooks – 20% of tuition at an average university and half of tuition at a community college. As a result, a very active Student Public Interest Research Group (PIRG) is pushing hard for affordable textbooks. They have had some success and the Higher Education Opportunity Act passed in US Congress in 2008, had provisions about the supply of textbooks, which came into force in July 2010. The main changes meant that publishers are now required to disclose prices when marketing textbooks to professors. They must also 'unbundle' their products so books can be bought without the add-ons, and colleges must be required to provide a list of assigned textbooks for each course, including prices.

### Market Size and Growth

It is estimated that the size of the total global market for school and post-secondary textbooks market was \$15.2 billion in 2009, growing to reach \$16.6 billion by 2012, representing a modest CAGR of 2.6%. Digital textbook products are expected to drive the market growth, with a CAGR of 25% while revenues from print textbooks will decline by 1%.<sup>1</sup>

The higher education textbook market in the United States, estimated at \$8.212 billion, makes up more than half of this, with predicted market growth of 2%.<sup>2</sup> Generally though, textbook markets are more proportionate. For example, in the UK, revenue from publishers selling textbooks direct to higher education students in the UK is about £200 million<sup>3</sup> whilst in schools it is worth £150m.<sup>4</sup>

There has been a lot of consolidation on the textbook publishing market in recent years, leaving four primary players, in order of size, Pearson, Cengage Learning, McGraw-Hill, and Wiley.

- 1 Outsell The Future of the Textbook Market, May 2010
- 2 Digital textbook Sales in the US- A five year projection, Dec 2010, <http://digital-textbooks.blogspot.com/2010/12/digital-textbook-sales-in-us-higher.html>
- 3 Joint Information Systems Committee (JISC)
- 4 Educational Publishers Council

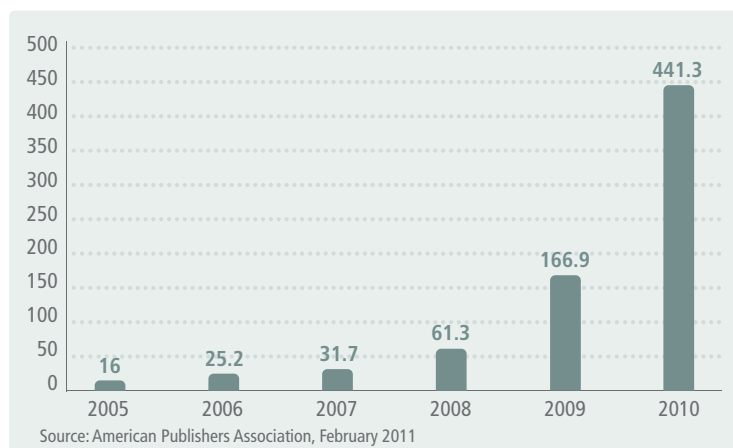
## 6.2 Impact of e-Books

The traditional textbook market is under enormous pressure from advent of e-Books. Their popularity has been gaining momentum over the last year. The market is developing fast and there is now a wide variety of content and a growing offering of e-Book readers, with prices decreasing, and other devices with e-Reader applications which ensure the reading experience is pleasurable. e-Books are beginning to move away from being a flat digital reproduction of a printed piece, and publishers are exploring richly visual interfaces that can include multimedia, interactive and collaborative elements.

The 2011 Horizon Report, which looks at the advent of technologies, reported that e-Books 'time to adoption' was in the near term, whilst for the first time in January 2011, e-Books outsold paper books on Amazon (on the back of Christmas sales of e-Readers). An executive from Pearson has said that 2011 was the time for the 'perfect storm' for e-Books as finally, the device, content and the route to market are all in place.<sup>1</sup>

Sales of e-Books in 2010 were \$444.1 million in the United States; this was a 164% increase on 2009 and represented 8.3% of total books sales.<sup>2</sup>

Growth in e-Book Sales in United States, US \$ million



The US is leading the storm to e-Books, with the UK only a little behind – e-Book sales account for 6% of UK publishers' sales and are valued at least<sup>4</sup> £16 million (\$24.7 million), up more than 300% in 2010. Furthermore, an industry survey of top publishers found many felt 2012 would be the revenue tipping points – a third of UK trade publishers thought that 10% of their revenue in 2012 would come from e-Books.<sup>5</sup> Other sources say that publishers have experienced sales growth of between 100% and 800% in 2010 compared to 2009, confirming the feeling that e-Books are becoming mass market.<sup>6</sup>

In Japan, the value of the e-Book market was estimated at about ¥58 billion (\$620 million) in 2009, and is expected to grow to ¥130 billion (\$1.4 billion) by 2010<sup>7</sup>, almost 10% of the market. However, a lot of this growth is driven by comic books, which are ubiquitous in Japan and read by young and old alike, and are easy to read on mobile phones' small displays. e-Book readers are not available in Japanese and there is virtually no market for electronic novels. Concerned about margins, Japanese publishers are also reluctant to supply books electronically, their revenues having already declined from the shrinking paper book market as consumers spend more time on the Internet and mobile phones.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

1 Genevieve Shore, Director of Digital Strategy, Pearson - Frontiers without Learning, January 2011

2 American Publishers Association

3 Idem

4 Publishers Association estimate that the digital consumer market could be close to £20m, including sales from those publishers not included in the PA yearbook panel

5 Publishing Technology UK trade predicts, 2012 will be tipping point for e-Books, March 2011

6 International Publishers Association interview with Richard Charkin, Bloomsbury executive director, PA representative to the IPA as reported in Bookseller.com, March 2011

7 Impress R&D, <http://www.yomiuri.co.jp/dy/business/T110103002744.htm>

### Adoption of e-Books has been slower in other countries:<sup>1</sup>

- **France** market represents about 0.5% of total sales in 2009 (\$15.5 million). Awareness and interest is currently low and there are very few titles available. French publishers pushing for legislation for fixed book prices for e-Books to keep control of their prices.
- **Spain** e-Books are about 1.6% of the market (\$68.2 million), with relatively modest growth expectations of 10%-12% of total over the next ten years.
- **Germany** sales are estimated at well below 1% (about \$116 million) of total sales, but this is shifting, with estimates of e-Book market share between 5% and 15% by 2015.
- **Netherlands** estimated 350,000 e-Books sold in 2010, representing about 0.3% or □1.8 million (\$2.4 million).<sup>2</sup>
- **Italy** Very small proportion of book sales – between 0.1% and 0.2%.

The gap between the US and other countries is however shrinking as more and more digital reading platforms and devices have global offers enabling easy global distribution of content.

Table: Worldwide e-Reader Sales<sup>3</sup>

Vendor	Sales Q3,2010 (units million)	Market Share
Amazon	1.14	41.5%
Pandigital	0.44	16.1%
Barnes and Noble	0.42	15.4%
Sony	0.23	8.4%
Hanvon (based in China)	0.23	8.2%
Others	0.29	10.4%

### 6.2 e-Book Readers

The sudden proliferation of e-Book readers and applications is one of the factors driving the growth in e-Book sales. The latest industry data from IDC expects total 2010 global sales of e-Readers to reach 10.8 million units, with 72.4% of these in the US. IDC are forecasting growth in sales to 14.7 million units in 2011 and 16.6 million in 2012, with demand driven by “by price competition among e-Paper-based device vendors, the introduction of colour display e-Readers, and the expansion of digital book and periodical content offerings across genres and languages.”

Amazon’s kindle is outselling all other dedicated e-Reader devices, and has a 41% share of the market. Pandigital and Barnes and Nobles offerings are currently only available in the US.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

<sup>1</sup> The Bookseller.com Digital Focus: the global e-Book market, March 2011  
<sup>2</sup> PriceWaterhouseCoopers  
<sup>3</sup> IDC worldwide quarterly tablet and e-Reader tracker, January 2011

Table: Comparison of Some Features of e-Reader Devices

	Amazon Kindle	Apple iPad	Barnes & Noble Nook	Kobo E-Reader	Pandigital Novel	Sony Pocket Reader
<b>Connectivity</b>	<ul style="list-style-type: none"> <li>■ Wireless</li> <li>■ 3G extra lifetime plan</li> </ul>	<ul style="list-style-type: none"> <li>■ Wireless</li> <li>■ Purchased 3G data plan</li> </ul>	<ul style="list-style-type: none"> <li>■ Wireless</li> <li>■ 3G extra lifetime plan</li> </ul>	<ul style="list-style-type: none"> <li>■ Wireless</li> </ul>	<ul style="list-style-type: none"> <li>■ Wireless</li> </ul>	<ul style="list-style-type: none"> <li>■ Wireless</li> </ul>
<b>e-Book Formats</b>	Kindle (AZW), TXT, PDF	ePub, PDF, TXT, DOC and more	ePub, PDB, PDF	ePub, PDF	ePub, PDF	ePub, PDF, TXT, RTF, BBeB
<b>Library e-Books</b>	No	Yes	Yes	Yes	Yes	Yes
<b>Internet Capable</b>	Yes	Yes	Yes	Yes	Yes	No
<b>Lend Books to Friends</b>	Yes	No	Yes	No	No	No
<b>Cost</b>	\$139-\$189	\$499-\$829	\$149-\$189	\$139	£189	\$179

The introduction of the ground breaking iPad, frequently described as the ‘game changer’ and the ‘tipping point’, will also have had a significant impact. And while the iPad currently has tablet market captured (90% share of Q3 global sales)<sup>3</sup> the competition is set to accelerate in 2011 with more the launch of several high profile products including Samsung Galaxy Tab, Motorola’s Xoom, and RIM’s Blackberry Playbook.

There have been a few attempts to develop e-Readers targeting the education sector, but little success so far:

- **Barnes & Noble** NOOKstudy an e-Reader application for higher education students, which enables them to organise all their digital content in one place, allows them to instantly download e-Textbooks, and trial for 7 days.
- **Kno** Produced a dual screen e-Reader designed specifically for the classroom too much fanfare, but was recently quietly dropped. Instead, Kno is focusing on educational software including an e-Book app.
- **Amazon** Kindle DX (pilot described below).

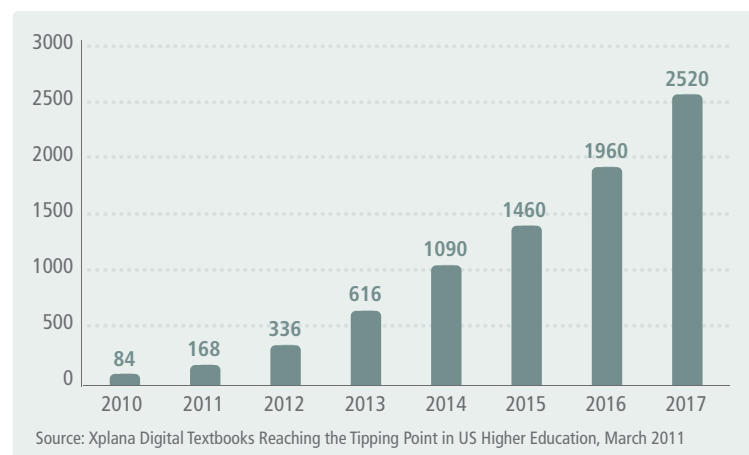
Increasingly, e-Reading software or apps are becoming available for other devices, for example InKling for iPads or Blio e-Reader for Android devices.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 **Textbook and e-Textbook Publishing**
- 7 Appendix

## e-Textbooks

While the e-Book market has taken off, the e-Textbook market is still emerging. There are not clear global market data available but it is estimated that in the US digital textbooks generated about \$84 million in sales in 2010, and this is expected to double to \$168 million in 2011 or roughly 3% of the total higher education textbook market. One forecaster predicts that by 2015 the market will reach \$1.5 billion in sales, or more than 25% of the total market.<sup>1</sup>

Growth in e-Textbook Sales in Higher Education United States, US \$ millions



Drivers of the e-Textbook sales include:

- **High cost of print textbooks and other learning materials:** Full time students spent on average \$693 on required course materials in 2010. Digital textbooks are generally cheaper than paper textbooks, thus making them more attractive to financially constrained students.<sup>2</sup>
- **Increasing availability of e-Textbook content:** from a sluggish start publishers are increasingly making their titles available in digital form. Amazon now lists over 30,000 academic titles, and all major publishing companies offering electronic versions.
- **Growing e-Reader device market:** market growth has exceeded expectations over the last 12 months with significant price falls driving demand. There is also a strong presence of e-Reader apps.

New readers also lend themselves better to academic study, as they have much clearer graphics and now offer the ability to bookmark and annotate, making reading and note-taking as easy electronically as it is on paper.

- **Growing penetration and sophistication of smartphones and tablets:** Forecasts suggest that by the end of 2012, 20% of college students will carry a tablet device. These devices are considered to be the best current form factor for delivering rich digital textbooks to students.
- **New standards for e-Textbooks:** in May 2011 EPUB 3 will be released. This will support a much richer media and interactive format that is needed to textbooks.
- **Increase in open textbooks:** Flat World Knowledge and Textbook media are making inroads into the traditional adoption landscape with alternative product and pricing models. These companies are driving the e-Textbook market as they publish digitally first, offer a print on demand service and thus have lower operating costs than traditional publishers. They also offer more attractive royalty models for their authors. Open Course textbooks are being sponsored by education authorities' as well as being produced commercially. For example the state of Washington has funded an Open Course Library and Florida have sponsored the Orange Grove Texts Plus which provides no-cost downloadable and printable open access texts.
- **Strengthening textbook rental market:** This market represents approximately 5% of the education textbook revenues in the US.<sup>3</sup> The successful entry of Barnes and Noble in 2010 demonstrates the market potential. This drives the e-Textbook market as the traditional publishers are realising that e-Books are a way of directly competing with this market (e-Textbooks are usually licensed for a limited period of time – in effect 'rented').
- **Students are becoming more sophisticated in their buying decisions:** Students are increasingly considering different purchasing options such as renting or sharing textbooks, or even fore-going the set texts.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

<sup>1</sup> Digital Textbooks, Reaching the Tipping Point in US Higher Education, Xplana, March 2011

<sup>2</sup> National Association of College Stores

<sup>3</sup> Xplana, Digital Textbooks reaching tipping point in the US Higher Education, March 2011

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

### Washington Open Course Library

Washington's Open Course Library is the largest state-funded project in the US. It aims to make core college course materials available on the Web for \$30 or less per class. It is financed with \$750,000 from the state of Washington and a matching grant from the Bill & Melinda Gates Foundation.

The goals are to reduce student costs and create engaging, interactive learning trials that will help improve course completion rates. By the end of the project in 2012, digitised textbook equivalents for some 81 high-enrolment classes will be available online for the more than 400,000 students. The materials can be shared, largely for free and they will be published in an open format that avoids the most onerous licensing restrictions.

The economics of the project are impressive with estimates that the initiative could save Washington State students up to \$41 million in textbook costs per year. The Washington taxpayers currently pay about \$74 million to fund grants to low-income college students, about half of which covers the cost of textbooks. Thus reducing the cost of textbooks, reduces the State's tax burden.

One thing is clear is that the textbook market does operate differently from the general book market and has been slower to make the digital move. Surveys of students still find that the vast majority express a preference for paper-based textbooks rather than a digital version, and in the 2010 College Student Tracking Survey, 80% student bought new print textbooks, 72% bought used textbooks, 20% rented and only 8% bought used text books. However this bias towards printed books could be a reflection of the current state of the e-Textbook market and the fact that up until very recently the availability and format has been fairly poor

Industry commentators sense a change in attitudes from all sides. Sean Devine of CourseSmart captures this pending shift well: It is not just market forces that are driving demand for e-Textbooks. There have also been various policy 'top down' initiatives to try to promote the use of e-Books in education. A policy prepared for the Democratic Leadership Council in 2009, proposed that it would be that public funding should be available to supply children with a Kindle in every backpack. And in the UK, Joint Information Systems Committee (JISC) have an on-going project working with universities, publishers and libraries to try to find a sustainable business model for e-Textbooks in libraries.

*"We've been talking about electronic textbooks for about 15 years as the next big thing. One thing that's different today is that all the stakeholders - the publishers, the hardware makers, the software producers, the consumers - are getting behind the idea. That's very different from what we saw when the e-Books first emerged in the late '90s. And when you have companies like Amazon, Google, and Apple getting into the game, that starts to break down barriers pretty quickly."<sup>1</sup>*

The Digital Textbook Initiative in California is leading the way in terms of e-Books in schools with its. The State has an annual spend of \$400million on textbooks for schools, the second largest state market in the US. Cost savings and a more comprehensive, tailored curriculum are driving the initiative. The programme is in two phases with the first calling for high school science and maths books to transition to digital textbooks, the second phase will see all textbooks to be available digital. Texas is also moving toward using digital books in schools having last year passed legislation allowing the definition of textbooks to include the digital format. They expect cost savings of \$2 million a year from the first phase.

Amazon ran a pilot with seven universities in 2009. This was not considered a great success, and while all those involved remained enthusiastic about the future of e-Books, they felt that there were too many challenges at that time to successfully implement full scale roll outs.



**Case Study – Amazon Kindle**

<b>Aim</b>	To make course materials available to students on Amazon DX devices.
<b>Date</b>	2009
<b>Scale</b>	Seven universities in the US
<b>Partners</b>	Amazon, Arizona State University; Ball State University; Case Western Reserve University; Pace University; Princeton, Reed College; and the University of Virginia, Darden School of Business
<b>Technologies</b>	Kindle DX
<b>Segment</b>	Further Education
<b>Funding</b>	Amazon-backed
<b>Description</b>	Amazon backed a project in seven US universities, who undertook pilots using the Amazon Kindle DX. The Kindle DX is a larger format version of the standard kindle device expressly built for academic texts, newspapers, and journals.
<b>Impact on Learning</b>	<p>In general the pilots concluded that there were still significant challenges to introducing the Kindle for mainstream academic use. While students commonly liked the reader friendly screen, the long battery life and the portability of the device, they found some aspects made studying hard:</p> <ul style="list-style-type: none"> <li>■ Availability of course materials – despite efforts by Amazon, not all materials were available, with particular problems in accessing journal articles.</li> <li>■ Format – much of the material available was only in PDF format but this meant loss of functionality such as annotating and highlighting. The solution to convert to different format took considerable staff time.</li> <li>■ Images and Colour – the low screen resolution was ill suited to complex diagrams and charts in academic texts.</li> <li>■ Content organisation – no way to file or organise materials stored on the Kindle.</li> <li>■ Hard to skim read.</li> <li>■ Notemaking and annotating - difficult and clumsy.</li> </ul>
<b>Lesson Learned</b>	<ul style="list-style-type: none"> <li>■ The most significant complaint was from some faculty who felt that their student’s comprehension of the materials suffered from the use of the Kindle DX as their reading become passive rather than active. Cost was the other factor, with many students saying that they would not purchase an e-Reader until it cost less than \$100, and that they would be more inclined towards a multifunction device such as tablet. Despite these challenges all the Professors who took part in the pilots felt convinced that e-Readers would become popular on college campuses.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

### 6.3 Disruption to Business Models

This section considers the impact of e-Textbooks on operating and business models in the publishing industry and describes the issues the traditional players face.

e-Books and digital content have been described as the disruptive innovation for the publishing industry. They comprise of an enabling innovating technology that has transformed the output/product of the industry and because their expense and distribution structure is so completely different to a traditional printed book, they are also disrupting the longstanding business model of the publishing industry.

#### Traditional Textbook Business Model

The textbook business model differs in some aspects from a traditional publishing model. Firstly authors rarely have agents and advances are rare. A textbook project is signed if it is felt that the projected value is worth a multiple of the cost of production (commentary suggests six times the project cost as a rule of thumb). The main decision making power lies with the editorial team who hold the projects budgets and responsible for the profits.

Once a project is signed it gets a formal development budget and a three year publication plan, including peer review, market tests and pilots. Marketing teams work to recruit reviews and host conferences with the aim to landing an adoption at a key institution or state that will influence others. During this three year period authors are essentially working for free as they will only receive royalty payments once the book is published and sold.

Traditionally, revenue is generated through a number of channels, some more important than others:

- **Individual choice** individual faculty member adopting a book.
- **Departmental adoption** the channel for the sale of the majority of the US textbooks. Often involves hard sell from campus reps, marketing and editorial teams.
- **Institutional adoption** the ideal scenario for a publisher and could result in multi-year commitment, and thus guaranteed revenue streams.
- **e-Retail** publisher have their own (and collective) retail sites so that they can sell straight to students. Limited scope due to lack of brand awareness from students.
- **Rental** some publishers have launched their own rental programme.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

One of the most interesting companies pushing richer e-Textbooks is start-up Inking. Inking is interesting because it focuses on painstakingly rebuilding textbooks from scratch, and therefore transforming them, in an iPad-friendly format. They have just received financial investment from Pearson and McGraw-Hill and in addition a commitment to provide content for Inking - Inking has announced they will be producing iPad books for:

- Top 100 undergraduate titles from McGraw-Hill Higher Education.
- Top medical reference titles from McGraw-Hill Professional.
- A full MBA curriculum from Pearson Education
- Top undergraduate titles from Pearson Education.
- Full medical education curriculum from Wolters Kluwer Health.

The Inking-based e-Books make full use of the iPad's colour, video and touch screen. A biology text, for example, offers 3-D views of molecules such as DNA, video lectures, and interactive quizzes. Users can highlight text, take notes and share them in real time with other users, such as fellow students. Along the way, students can jump outside the text to Google or Wikipedia.

In order to produce content that is flexible enough to be used by digital technologies, it will need to be disaggregated, and no longer viewed simply as a textbook. Publishers will need to create content repositories from which new products can be launched quickly and cost effectively.

### Pricing

One of the major issues that traditional publisher have when selling e-Books is how to price them. Consumers expect them to be cheaper than printed books (given the lower costs of production) but publishers have maintained that it is the 'content' that has value, not the physical product. Amazon has added to publishers' discomfort by pricing Kindle books at about half the price of a hard copy.

Publishers are also grappling with a change in supply side of e-Book pricing models. Generally publishers have worked on a 'wholesale' basis, selling printed books to retailers for a RRP, less a discount, and then letting the retailers decide the price in store.

e-Books and in particular, the entrance of Apple as a retailer through iTunes, has led to an 'agency' model. In this, the publisher decides the retail price and then pays the retailer (or agent) an agreed commission on every sale - 30% of the sale price in the case of Apple. Publishers welcome the control this gives and hope it will take some power away from Amazon, who, without the agency model, would be able to discount everyone else out of business.

Amazon was clearly reluctant to move to this model for e-Books and had a public row with Macmillan, over the publisher's intention to price their e-Books higher than the Amazon preferred price. This led to the withdrawal of Macmillan products from Amazon for a couple of days, before Amazon capitulated to Macmillan's terms.

However, the emergence of the agency model may be challenged, as the EU has launched an anti-competitive trading investigation. This involved raids on several major publishers in March 2011, because Directorate General for Competition said the Commission had "*reason to believe that the companies concerned may have violated EU antitrust rules that prohibit cartels and other restrictive business practices.*" The enquiry is on-going.

In the UK, the Office of Fair trading has also launched (January 2011) an investigation into whether arrangements that certain publishers have put in place with some retailers for the sale of e-Books may breach competition rules. This is also at an early stage.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

### New Competition

Digital technology is threatening to cut out the role of the publisher. Amazon has made it relatively simple and cheap for authors to self-publish an e-Book, as well as produce print versions. Publishers often dismiss them as ‘vanity’ pieces, but some self-published authors are successful. An added threat is that existing successful authors can see an alternative to using a big publishing house, and paying indirectly for their involvement - a \$2.99 self-published e-Book generates much bigger royalties for the author than a \$9.99 traditionally published paperback. Authors could hire their own publicist etc., and take more control of their titles.

For the moment, this threat is manageable as the majority of sales are still paper versions, but the publisher’s power is weakening, and if one of the technology companies, such as Amazon or Apple, decides to lure a best-selling author, the game could really change.

In the textbooks market, self-publishing has also taken another form – that of open access. Open textbooks are seen by some faculty, institutions and states as a potential answer to the increasing financial burdens on students. Companies such as Flat World Knowledge and Textbook Revolution are providing open access academic digital content at a fraction of the price of paper textbook, or even a ‘flat’ e-Book version such as those sold on CourseSmart.

### Changing Workflows

The traditional textbook industry is cyclical, particularly in the United States, with publishers producing new editions on average every 3½ years (even in fields where little has changed such as maths or chemistry). This is a response to state adoption cycles, reviews of recommended texts by university faculty and efforts to combat the used textbook market. Currently the digital version of a textbook would be created at the end of a production cycle, when the print book is ready to press. Eventually, growing demand for digital content will alter workflows so that it can be printed on demand, with digital format leading the way over print.

### 6.4 Impact on Wider Ecosystem

The textbook publishing market is closely entwined other markets, such as libraries, used books and retailing. Here, we consider the impact of e-Textbooks in these markets.

### Used Book Market

The used textbook market is a vibrant and active market, especially in the United States. It not only offers students a cheaper purchasing option, but also a chance to recoup some money once they have finished with the book. In some cases, for a current edition that will be used the next year, a campus bookshop will pay 50% of the original price paid. If the version of the book is not being used again the following year at a specific university, then the campus bookshop may sell on to one of the national used books distribution companies who resell used books to other college bookstores. The used edition would then be resold to a student for approximately 75% of original cost.

The threat of digital textbooks to the used textbook market comes from the fact they will generally be sold for a lower price point than even a used book. The use of DRM means that there is no used book market for e-Textbooks.

### Libraries

In the UK, a third of libraries have the technology for members to borrow e-Books, without physically going to the library.<sup>1</sup> Publishers are concerned that overseas borrowers use these services, which undermine their revenue, but it is a growing service. Most libraries use a system like Overdrive, which is an e-Book distribution and lending system. They have over 500,000 premium digital titles and deal with the download, DRM and secure management of e-Books on behalf of customer institutions. Latest usage figures showed that in 2010, there was a 200% increase in the number of worldwide ‘check outs’ and more than a million new users signed up for the service.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

Most of the major textbook publishers offer e-Textbook collections to libraries. However the model with which this can be sustainable for the libraries and students is not completely clear. To this end, and to better understand the economic impact of e-Books on university libraries, publishers, and aggregators, JISC commissioned a set of trials in 2010. They engaged eight leading textbook publishers (including Cengage, Pearson, McGraw-Hill) three aggregators, and ten universities to test various models of e-Book distribution. The trials aim to test four hypotheses:

- Assess the sustainability of offering unlimited concurrent access to e-Textbooks via aggregated platforms and/or publisher-specific platforms.
- Explore the role of the library in offering students a range of access options to e-Textbooks, such as access to individual chapters and pay per use, print only, e-Only and print/e-Bundles.
- Assess the impact on print sales of textbooks of offering e-access via libraries, and finding out what students want if they have a range of options – for example accessing via the library, purchasing a print copy or print/online package, purchasing an e-Only edition, or purchasing or renting a chapter.
- Establish whether making e-Textbooks available through libraries improves the sell-through of existing adoptions.

The full final report is not yet available, but a presentation of the findings showed three realistic options for university libraries to provide affordable access to e-Textbooks:

- Rental to cover key periods of heavy use (prior to exams and course assessments).
- A basic library version compared to student edition offering greater functionality.
- Consortia arrangement with an organisation, such as CourseSmart, which would maintain the ‘student pays’ model but with the consortia as the intermediary.

## 6.5 Responses of Leading Publishers

This section looks at how some major players in the textbook industry have responded to e-Books, and also, to the potential of Mobile Education. It does not aim to give a complete picture of all the players but rather a look at the different approaches taken by some companies.

In terms of strategic focus, the summary positions are:

- Pearson, the market leader, is also leading the shift to digital, including e-Books, and increasingly taking this one step further with the shift to mobile – “*We know there is a market there for computer book content on mobile devices, and the iPhone is our current target*”. Mark Taub, editor in chief at Pearson Education.
- Cengage has one of the most innovative e-Textbook offerings, supported by a broader e-Learning, but less focus on Mobile Education, apart from development of apps.
- McGraw-Hill is producing content for lots of formats, developing mobile platforms and involved in developing a device. Notably, it seems to be partnering with small nimble companies with technology expertise to push their content on to mobile devices.
- Wiley is embracing technology and can obviously see the potential in e-Books, but there is little sign of cutting edge developments and minimal engagement with Mobile Education, aside from a rather predictable set of iPhone applications.
- MacMillan restricted to small range of e-Books and e-Textbooks available through a few channels. Stand-off with Amazon reflects defensive position, rather than embracing new opportunities.

### Cengage Learning

Cengage is a leading global provider of print and digital teaching, learning and research products for the education, professional and library markets. It provides both print-based and digitally-enabled learning solutions and services to customers in three segments: academic (secondary and post-secondary), professional and library. The company had revenues of \$2,018 million for the year ended June 30, 2010 of which about 88% was from the U.S. and 12% were from markets outside the US.

In the academic market, revenue is from textbooks and, increasingly, digitally-enabled learning solutions to colleges and universities. Products are sold through bookstores, online retailers and other distribution channels, as well as directly to students through Cengage online e-Commerce offerings (CengageBrain.com and HighBeam.com). Digital products are more likely to be purchased via online channels,

as well as in bundles with print products, and typically have a finite life span (e.g., a semester) after which a user's access and support are terminated. Some schools, like career and for-profit schools, make institutional purchases for all students enrolled in their courses and include the textbooks as part of the course fee.

In the library market, revenues are generated from the sale of digital and print reference materials to academic, school and public libraries, as well as subscription-based revenue by providing access to online reference works and digital archives.

The company is digitally focused and places strategic emphasis on the integration of technology with content, to produce interactive and stimulating products and services.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

Segment	Activity
<b>e-Books</b>	<ul style="list-style-type: none"> <li>■ Incorporated into most of Cengage Learning’s main product offerings, but strategic focus is on more interactive digital learning such as homework solutions and assessment tools rather than ‘flat’ e-Books.<sup>1</sup></li> <li>■ Core integrated digital product suite CengageCourse includes interactive e-Textbooks in the CourseMate and Course360 components.</li> <li>■ CengageBrain - online portal selling 15,000 Cengage products to students:               <ul style="list-style-type: none"> <li>– Covers textbooks, e-Textbooks, digital chapters, study tool and textbook rentals</li> <li>– e-Books are supplied in a secure PDF file format, through downloadable viewer with DRM software. Not readable on devices such as Kindle, Sony Reader or iPad</li> <li>– Licensed for 2 computers and expires after 2 years</li> <li>– e-Textbooks are sold at 50% of the suggested list price for the print version</li> </ul> </li> <li>■ MindTap (launched March 2011) is a Web portal that school students log into to access interactive e-Textbooks, customizable apps, and other course material:               <ul style="list-style-type: none"> <li>– Currently being piloted in a few schools</li> <li>– Accessible from a range of devices</li> <li>– Marketed as a Personalised Learning Experience with emphasis on the interactive content including assignable and gradable learning activities.</li> <li>– Offers instructors a choice of content, learning pathways and learning tools so they can track student use, and record their grades and learning outcomes.</li> <li>– MindTap Reader at core of product which is a new interactive platform adds functionality to e-Books, including video/audio, annotations, activities, applications and instructor source materials</li> <li>– 20 titles available by autumn.</li> <li>– No charge for access, but course-material packages will cost \$50-\$75</li> </ul> </li> </ul>
<b>Mobile Education</b>	<ul style="list-style-type: none"> <li>■ Stated policy is not to concentrate on one form factor but to ensure that their content is deliverable across all devices. (See MindTap above)</li> <li>■ Developed a handful of apps and are involved in a small pilot:               <ul style="list-style-type: none"> <li>– AccessMyLibrary Public Edition – Android OS app, allows users free access Gale (Cengage) resources available through public libraries within a 10 mile radius of where they are</li> <li>– AccessMyLibrary College edition – iPhone, iTouch and iPad application for college students to access Cengage resources in their college library via a mobile device</li> <li>– Pilot with StudyCell to create a mobile learning application that enables learners to review key terms from their textbook in the form of mobile flashcard modules. Currently covers four textbooks</li> </ul> </li> </ul>
<b>Partnerships</b>	<ul style="list-style-type: none"> <li>■ Founding partner of CourseSmart</li> <li>■ Partnering with Inkling to produce interactive textbooks for the iPad. Few details have been revealed in terms of titles or timescales</li> </ul>

<sup>1</sup> The future of textbooks – interview with William D. Rieders, executive VP at Cengage, Feb 2011

### John Wiley

John Wiley & Sons is a global publisher of print and electronic products, providing content and digital solutions to customers worldwide. Core businesses are:

- **Scientific, technical, medical and scholarly (STMS)** produces journals, encyclopaedias, books, online products and services. Accounted ~ 58% of total revenue in 2010, majority of which were journal subscriptions.

- **Professional/trade** acquires, develops and publishes books, subscription products and information services covering a range of subjects. ~25% of revenues in 2010. Includes the For Dummies and Fromers titles.

- **Education** published educational materials in all media, mostly through WileyPLUS, the company's integrated online learning environment. Products are delivered online and in print, principally through college bookstores, online booksellers, and websites.

Segment	Activity
<b>e-Books</b>	<ul style="list-style-type: none"> <li>■ 2% of overall sales in 2010.</li> <li>■ All Wiley and Blackwell's existing content digitised and available.</li> <li>■ WileyPLUS online learning system includes e-Textbooks and interactive resources.</li> <li>■ Wiley Desktop Editions: in partnership with VitalSource.com, e-Book versions of print texts, ~40% of print list price.</li> <li>■ Wiley Online Library offers 10,000+ online books.</li> <li>■ Use authorised sellers such as Plodit and Amazon.</li> <li>■ Partnered with IEEE to launch a joint e-Book library for Bioengineering, Power &amp; Energy and Communication technologies.</li> </ul>
<b>Mobile Education</b>	<ul style="list-style-type: none"> <li>■ MobileEditions – users of Wiley Online Library and Wiley InterScience can access table of contents and abstracts of journal articles on mobile devices.</li> <li>■ Mobile Apps - Growing range of apps related to their textbooks, reference and revision books. Includes Apps for Dummies Apps, Cliffnotes, Fromers titles.</li> </ul>
<b>Partnerships</b>	<ul style="list-style-type: none"> <li>■ Partner in CourseSmart.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix



### Macmillan

MacMillan Publishers is a one of the largest privately owned publishing groups in the world, and consists of over 350 separate companies that publish academic and scholarly, educational, fiction and non-fiction titles. It is much more of a traditional publisher and seems to be lagging behind in embracing technology and e-Books.

Macmillan e-Book has had a public dispute with Amazon over the sale of e-Books. They wanted to move to an 'Agency' model for e-Books for the iPad rather than the 'wholesale' model in place for Kindle e-Books. This resulted in Amazon removing Macmillan books from their site for a few days until eventually capitulating to the publishers demand to price titles at \$14.99 rather than the Amazon price of \$9.99. Macmillan stated that they wanted to create a "stable and rational" business model for e-Books, based on "ink-on-paper" retail, with "dynamic" pricing that changes depending on how long the book has been available.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

Segment	Activity
e-Books	<ul style="list-style-type: none"> <li>■ Range of about 3,500 Palgrave Macmillan e-Books available. Sold via their website and selected retailers such as Amazon and e-Books.com.</li> <li>■ Palgrave Connect – offers libraries and institutions collections of e-Books via site licenses. 7000 titles available.</li> <li>■ Little penetration e-Textbooks. Macmillan Iberia has started to supply digital course books alongside print versions.</li> <li>■ Macmillan Bookstore – adopted platform for e-Textbooks.</li> </ul>
Mobile Education	<ul style="list-style-type: none"> <li>■ English Language Apps for iPhone, iPad, based on English dictionary for Advanced learners.</li> <li>■ 55 Education Reader titles available as from iBookstore for iPhone, iPad, Touch.</li> </ul>
Partnerships	<ul style="list-style-type: none"> <li>■ Partner in CourseSmart though Bedford, Freeman and Worth imprint.</li> <li>■ GoSpoken.com - to make e-Books available via mobile phones.</li> <li>■ Lexcycle Stanza - e-Books available for the iPhone.</li> </ul>

### McGraw-Hill

McGraw-Hill Companies is a large group of companies delivering information services to the financial education and business information sector. The Company had revenues of \$6,168 million and employed 21,000 of which 11,000 were in the US. Their education division is McGraw-Hill Education (MHE), a leading global publisher working across schools, higher education, professional and international markets. They have two operating groups:

- **School Education Group** sells print and digital textbooks and hybrid supplemental materials and provides online and traditional assessment and reporting services. The market for textbooks consists of adoption states and open territory states. In 2010, successfully obtained 30% of new school adoptions.

- **Higher Education, Professional and International Group** provides integrated digital e-Learning platforms, textbooks and other resources to higher education institutions.

McGraw-Hill has a clear strategy of embracing technology to create new and expanded revenue opportunities. In the HPI segment, the focus is on driving digital usage by aggressively pursuing a variety of e-Initiatives, including e-Books, homework support for students and online faculty training and support. The company has a dedicated digital centre to develop online education programmes.

Segment	Activity
e-Books	<ul style="list-style-type: none"> <li>■ ~95% of HE and all elementary and secondary school content available digitally.</li> <li>■ Sold via own websites and other distributors, including Amazon and CourseSmart.</li> <li>■ McGraw-Hill Create – online book store:                             <ul style="list-style-type: none"> <li>– Aligned to schools adopted content.</li> <li>– Customised e-Books publishing for faculty members. Can include chapters, cases, and self-authored material. Supported by 700,000 page database.</li> </ul> </li> </ul>
Mobile Education	<ul style="list-style-type: none"> <li>■ LearnSmart – adaptive learning system:                             <ul style="list-style-type: none"> <li>– Available via Connect (MH's homework management system) or as app for iPhone and iPad.</li> <li>– 35 courses will be available by end of 2011.</li> </ul> </li> <li>■ mConnect – in development with Wipro, open standard mobile learning platform that will use mobile devices to deliver affordable education services to bridge skills in emerging markets in Africa and Asia services.</li> <li>■ McGraw-Hill Companion Touch – touch screen, tablet (partner M&amp;A technology):                             <ul style="list-style-type: none"> <li>– Product announced but yet to be launched.</li> <li>– Aimed at K-12 market and 1:1 computing strategies.</li> <li>– Loaded with interactive content, educational software and classroom management software.</li> <li>– Functions a e-Reader, has webcam.</li> </ul> </li> <li>■ Bluster – Vocabulary building game for the iPad.</li> </ul>
Partnerships	<ul style="list-style-type: none"> <li>■ Blackboard - deal to integrate materials through BB LMS.</li> <li>■ Inkling - McGraw-Hill has invested in Inkling, producer of interactive textbooks for the iPad. Inkling will publish MHE top 100 undergraduate titles and some medical and reference books.</li> <li>■ enTourage Systems – agreement to offer MHE higher education content through enTourage's eDGe interactive Dualbook which combines features of e-Reader, notepad and tablet netbook. More than 100 MHE titles will available and will include functionality to make and share note and view video. 3G enabled.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

## Pearson

As the largest education company in the world, Pearson and their activities in Mobile Education have already been described. Within this, they hold the position one of the world's largest publishers through the Penguin aim targeting consumers

Pearson is an international media and education company focusing on the education, business information and consumer publishing markets. It delivers content in a variety of forms and through a variety of channels, including books, newspapers and online services. Though they operate in more than 70 countries, their largest market is the US (59% of sales).

Pearson Education is a leading provider of educational materials and learning technologies. It publishes across the curriculum and provides

a range of education services including teacher development, educational software and system-wide solutions. The US higher education business is the largest publisher of textbooks and related course materials for colleges and universities in the US. Nearly 50% of US schools use at least one Pearson student curriculum, instructional management or financial software packages.

Pearson's other primary businesses include the Financial Times Group and the Penguin Group.

Pearson has made a significant shift from a 'traditional' to a digital based business model, to the extent that digital revenues have reached 29%. The digital strategy focuses on adding services to our content, usually enabled by technology, to make the content more useful, personal and valuable.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

Segment	Activity
<b>e-Books</b>	<ul style="list-style-type: none"> <li>■ Ongoing investment at Penguin to transform publishing processes onto Pearson-wide digital platforms, enabling faster product development and more efficient creation and re-use of content.</li> <li>■ e-Books were 6% of Penguin revenues in 2010, up 182% on previous year.</li> <li>■ Increasing use of apps to enhance published offering.                             <ul style="list-style-type: none"> <li>– App releases in children's market including Spot, Peppa Pig, The Little Engine That Could, Topsy and Tim, Ladybird's Babytouch and the Mad Libs app, (one of the best apps at the 2010 e-Book Summit).</li> <li>– For adults, we launched the groundbreaking myFry app; published the amplified e-Book of Ken Follett's The Pillars of the Earth, featuring video, art and music from the original TV series; and introduced ten DK Eyewitness Top Ten Travel Guides apps.</li> <li>– CourseSmart App for iPads and iPhone.</li> </ul> </li> <li>■ Pearson Education – released first iPhone and iPad applications, which are ebooks that let consumers buy additional content chapters within the app. However, target is home, office, technical and professional communities.</li> <li>■ Pearson Learning Solutions – creates e-Books for deployment in LMSs, portals, custom websites and mobile devices.</li> <li>■ Safari Books Online – digital library which can be accessed on e-Readers, mobile devices and beta-testing iPad app.</li> </ul>
<b>Mobile Education</b>	<p>See earlier section</p> <ul style="list-style-type: none"> <li>■ CourseSmart – leading the shift to e-Textbooks. Joint venture with Cengage, McGraw-Hill, Wiley. Delivers 14,000+ e-Textbooks and e-Resources - 90% of core higher education textbooks - to a common platform for laptops.</li> <li>■ Inkling – investment announced Mar 2011. Currently 14 titles - plans to grow to 100 by the end of the year.</li> </ul>
<b>Partnerships</b>	<ul style="list-style-type: none"> <li>■ MobileDu - joint venture with Nokia in China                             <ul style="list-style-type: none"> <li>– Provides English-language learning materials and other educational content, from a variety of content providers, directly to mobile phones.</li> <li>– 20m+ subscribers, 1.5m active users each month.</li> <li>– Business growing at 400% a year.</li> </ul> </li> <li>■ Founding member of Digital Learning Council in the US.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing**
- 7 Appendix

### Other players

Most of the players - Pearson, Cengage, McGraw-Hill, Macmillan and Wiley - collaborate on CourseSmart, which is an online distribution channel for e-Textbooks. It creates digital books in the format of printed textbooks and delivers them to a common platform for laptops.

It delivers:

- 14,000+ e-Textbooks and -Resources from leading publishers - 90% of core textbooks in US higher education.
- Titles sell at an average 60% less than list price for print version.
- Includes user tools such as search, highlighting, note-taking.
- CourseSmart app for iPad and iPhone to enable download of books to devices.
- 1m professor accounts.

CourseSmart is also involved in pilot research with University of Michigan to assess effect of using e-Textbooks on student's performance.

Apart from the largest players in the textbook market, other publishers are making notable inroads into both e-Books and Mobile Education.

Some examples are:

- **Scholastic (Education Publisher):**
  - INTERWRITEMOBI® - mobile interactive whiteboard designed to support student-centric collaborative learning.
  - Make Learning Mobile site - share best practices, teacher-tested ideas, and research on the power of mobile learning. Delivered in partnership with AT&T.
- **Houghton Mifflin Harcourt (Education Publisher):**
  - SkillsTutor division courseware on mobile devices, including tablets and smart phones via the cloud.
  - Fable - portable tablet that targets children and allows reading, drawing, games and sharing over the mobile broadband network. Developed by Isabella Products. Pre-loaded with content from HMH.
  - Mobile games for children to play on the iPhone and iPad featuring Curious George and Gossie.
- **Harper Collins**
  - limit libraries to 26 loans before e-Book self-destructs.
- **Open University**
  - added 100 free interactive e-Book titles on to iTunes U, plans to add another 200 titles. Aims to provide interactive e-Books as a standard feature for all future courses.

# 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

## 7.1 Global Mobile Education Initiatives

Mobile Education has typically been project-based, often with an innovation agenda, short-term funding and a localised geographic focus. In this reference section we describe a few cases where Mobile Education has been promoted at a global scale as well as examples of projects rolled out at regional (or cross country) and national levels.



## Global Examples

### One-Laptop-Per-Child

The One-Laptop-Per-Child (OLPC) programme is one of the most ambitious educational reform initiatives to date. It developed a radically new low-cost laptop computer and aggressively promoted its plans to put laptops in the hands of millions of children around the world, especially those in the most impoverished nations.

The programme's founder and chairman, Nicholas Negroponte, predicted the initial distribution of 100-150 million laptops by 2008 to targeted developing countries. As of March 2011, about 2 million XO laptops had actually been delivered or ordered in 31 countries. In most cases, there are either small pilot programmes implemented by NGOs or OLPC programmes in local areas or regions that have not yet spread elsewhere. Each OLPC programme around the world is implemented with a large degree of autonomy, so results vary.

Current XO deployment projects differ in almost every respect, including how they are set up, funded, managed, implemented, and supported. All projects involve a number of entities, ranging from international donor agencies, national ministries or local departments of education and ICT companies, to Non-Government Organisations or private non-profit foundations.

In May 2010, OLPC production of their proprietary XO-3 and announced that they would adopt the Marvell tablet device. OLPC intends to release the Marvell-based OLPC device in mid-2011.

Mobile Education Ecosystem	Strategic Focus	Activities
<b>Device Manufacturer</b>	High	<ul style="list-style-type: none"> <li>■ XO laptop, with XO tablet currently under production.</li> <li>■ Produced by Quanta Computer's manufacturing plant in China.</li> <li>■ Designed as an educational tool with constant connectivity for use within and outside classrooms.</li> <li>■ Several configurations - standard laptop, e-Book reading, gaming.</li> <li>■ Designed to adapt to different contexts, e.g. extreme conditions such as high heat and humidity, easy field repair by children.</li> </ul>
<b>Services and Content Providers</b>	High	<ul style="list-style-type: none"> <li>■ Provides support at the country level includes planning, execution and support.</li> <li>■ Provides content in the form of hundreds of educational "activities" and supports local networks in the development of software and digital content.</li> <li>■ All software on the laptop free and open source, with countries expected to adapt to local laws, language and educational needs.</li> <li>■ Includes other programme, e.g. Scratch (developed in 2007 at the MIT Media Lab) and Etoys (developed by Apple in 1996).</li> </ul>
<b>Distributor</b>	Medium/ Low	<ul style="list-style-type: none"> <li>■ XO laptops are deployed and distributed mainly by governmental agencies and non-profit organisations.</li> <li>■ Services to end users and technical support are provided by the OLPC Foundation, governmental agencies or private companies.</li> <li>■ OLPC website is major platform for the delivery digital content and applications created by OLPC Foundation and third parties, especially MIT Media Lab.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### Case Study – Plan CEIBAL in Uruguay

<b>Aim</b>	<ul style="list-style-type: none"> <li>■ Close the digital divide.</li> <li>■ Improve learning outcomes.</li> <li>■ Improve the country's competitiveness by promoting digital skills.</li> </ul>
<b>Date</b>	Pilot programme in 2007, national deployment in 2008-2009
<b>Scale</b>	All primary public schools
<b>Partners</b>	OLPC Foundation, Ministry of Education, Uruguay's Technological Laboratory, National Telecommunications Company (ANTEL), National Agency for Public Education, Centro CEIBAL (managing organisation)
<b>Technologies</b>	XO-1.0 and XO-1.5 laptops
<b>Segment</b>	Schools
<b>Funding</b>	<ul style="list-style-type: none"> <li>■ Funded entirely by national government.</li> <li>■ Initially represented 0.2% of GDP (&lt;5% of national budget for education), annual operational costs of &lt;0.1% of GDP.</li> <li>■ Following initial success, ongoing financial commitment from national government.</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>■ Deployed 380,000 laptops in primary schools and about 100,000 in secondary schools (as of April 2011).</li> <li>■ Provided internet servers in 2068 schools (98% student coverage). Also provided servers for 250 public places (public squares, sports clubs, etc) with Internet connection.</li> <li>■ Trained 20,000 teachers, 500 Support teachers, and 1500 volunteers.</li> <li>■ Created educational portal and a TV channel on national television for content dissemination and ongoing training.</li> <li>■ Provided technical support by private companies and by a centralised technical support call-centre free of charge.</li> </ul>
<b>Impact on Learning</b>	<ul style="list-style-type: none"> <li>■ Use of technology to improve learning processes now embedded in teaching and learning at a national level.</li> <li>■ Evaluations have shown little improvement in literacy but an improvement of 15% in mathematics and logical reasoning.</li> <li>■ 87% children have reportedly taught other children or family members to use the XO laptop.</li> </ul>
<b>Lessons Learned</b>	<ul style="list-style-type: none"> <li>■ Teacher training courses implemented after laptops were deployed so teachers had difficulty in adopting the technology.</li> <li>■ Although content is available, there is a lack of knowledge of how to use and integrate it in the classroom context.</li> <li>■ Devices not sufficiently robust – 14% of the laptops were broken in one way or another and 13% were unusable at any one time.</li> </ul>
<b>Sustainability</b>	Currently rolling out to preschool, secondary and technical/vocational schools, also at a national scale

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### Intel World Ahead Programme

Intel's World Ahead Programme was first established in 2006. It designed a platform for low cost laptops that third party manufacturers could produce under their own brands. The key areas of the programme are: accelerating technology access and usage for more people; connectivity; education; digital content and services and healthcare.

While the Classmate PC was designed for students in emerging markets, they are currently deployed in more than 20 countries worldwide. This includes 100,000 laptops in the United States, 525,000 in Venezuela, 630,000 in Argentina, 2,500 in Russia, and 750,000 in Portugal.

Mobile Education Ecosystem	Strategic Focus	Activities
<b>Device Manufacturer</b>	High	<ul style="list-style-type: none"> <li>■ Intel-powered classmate PCs.</li> <li>■ Produced by Intel Learning Series Alliance (350+ companies).</li> <li>■ Designed as a learning tool with localised content, professional development and optimised software.</li> <li>■ Adapted by local technology companies to ensure sustainability and support for local economies.</li> </ul>
<b>Services and Content Providers</b>	High	<ul style="list-style-type: none"> <li>■ Works with private-public partnerships with local non-governmental organizations, national governments, local software and hardware providers, local computer manufacturers and content providers.</li> <li>■ Pre-loaded with education-focused software and applications.</li> <li>■ Intel's skool™ Learning and Teaching Technology provides free online resources for math and science, and is available in 20 countries and seven languages at <a href="http://www.skool.com">www.skool.com</a>.</li> </ul>
<b>Distributor</b>	High	<ul style="list-style-type: none"> <li>■ Distributed by non-governmental organizations and national governments as well as by local computer manufacturers.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix



### Case Study – 1:1 Intel e-Learning in Nigeria

<b>Aim</b>	<ul style="list-style-type: none"> <li>■ Bridge the digital divide.</li> <li>■ Attain an information and knowledge based economy and society.</li> </ul>
<b>Date</b>	Pilot programme in 2007, further deployments in 2008-2009
<b>Scale</b>	71,000 Classmate PCs deployed nationally
<b>Partners</b>	Intel, Nigerian National Government, local manufacturers
<b>Technologies</b>	Intel-powered Classmate PC running with Windows XP
<b>Segment</b>	Public and private junior secondary schools
<b>Funding</b>	Funded by Intel's World Ahead Programme, the Federal Government of Nigeria's Education Trust FUND, the Universal Service Provision Fund, education service providers such as Zinox Technologies, EDtek Learning Services, Chips, Bites & Bytes, TSC and others
<b>Description</b>	<ul style="list-style-type: none"> <li>■ Initial three-month pilot project in one secondary school.</li> <li>■ Followed by roll out of 200 more Classmate PCs in 7 schools and creation of Intel's Skool Nigeria.com.</li> <li>■ In second phase, Intel began working with Nigerian manufacturers and expanded the model to private and public schools across the country.</li> <li>■ Teachers' trained through the Intel Teach programme.</li> <li>■ Curriculum based digital content from the Intel Skools programme.</li> </ul>
<b>Impact on Learning</b>	<ul style="list-style-type: none"> <li>■ Review after initial pilot showed 30% improvement in student's academic performance. End-of-term exams showed the pilot class scoring higher than two comparable classes in all areas of the curriculum.</li> <li>■ Intel case study showed student motivation and performance increased with corresponding decrease in truancy and absenteeism from school.</li> <li>■ 80% of teachers felt 1:1 computer learning was now essential for their teaching, while 100% found it easier to complete teaching tasks such as grading, lesson preparation and communication using computers.</li> <li>■ Project resulted in shift from the traditional "teacher-centric" model to a more "student-centric" model, with students becoming more independent, exploring more and depending less on the teacher.</li> </ul>
<b>Lessons Learned</b>	<ul style="list-style-type: none"> <li>■ Breakage - of 240 laptops originally deployed, only 180 still fully functional in 2009. Majority of the faults related to screen problems.</li> <li>■ Availability of power has been a huge setback.</li> <li>■ Internet connectivity a challenge.</li> <li>■ Teachers claim that they do not have sufficient digital content to teach their subject areas nor the requisite training to develop them.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### Mobile Technologies in Lifelong Learning (MOTILL)

MOTILL was a one year project funded by the European Commission. It focuses on the use of mobile technologies as a key factor to develop flexible lifelong learning frameworks for formal and informal education and training.

The project was implemented during 2009 and had four participating organisations in Italy, UK, Ireland and Hungary. An interesting aspect of this programme was the involvement of policy makers to promote local and national targets for lifelong learning in line with European benchmarks and strategic objectives.

### Other Examples

- **Acer-European Schoolnet Educational Netbook Pilot** started early in 2010. Aimed at understanding and documenting how learners and teachers can use netbooks in various educational contexts. The aim is to explore how the introduction of netbooks and 1:1 pedagogy in schools could change teaching and learning processes. Until June 2010 the pre-pilot involved 10 classes in 6 countries (UK, France, Germany, Spain, Italy and Turkey), while the full deployment phase will run from September 2010 to June 2011 involving 40 classes in each country.
- **Pocketschool** e-Learning project using a mobile learning device called Teachermate developed by Innovations for Learning, Inc. in association with Stanford's School of Education. It is now being used in over 300 schools in the United States and in rural schools in Mexico, Korea, Rwanda and the Philippines.
- **Open Learning Exchange** non-profit global organization providing technology (both XO laptops and Teachermate devices), teacher training and software to a network of 100+ local grassroots organizations. Assists its local partners in organising curricula, outreach, and financing, and management tools. It has projects running in Ghana, Rwanda, Nepal and Bolivia.

### Case Study - MoUle (Mobile and Ubiquitous Learning in Palermo Italy)

<b>Aim</b>	Support students using context sensitive handheld devices in collaborative knowledge construction
<b>Date</b>	One year programme, started March 2009
<b>Scale</b>	114 students in 4 secondary schools in Palermo
<b>Partners</b>	MOTILL, Institute for Educational Technologies, Government of Sicily
<b>Technologies</b>	Smartphones supplied with GPS
<b>Segment</b>	Secondary schools
<b>Funding</b>	Funded by MOTILL
<b>Description</b>	<ul style="list-style-type: none"> <li>■ Two four months cycles, divided into two phases: initially, teachers were supported in planning educational activities based on the MoUle system; then the prototype was tested with students and teachers.</li> <li>■ Students started learning about the MoUle system and getting used to the mobile devices, partly in the classroom and partly on site.</li> <li>■ Able to track students during the collaborative knowledge building process and reconstruct the physical exploration of their learning space.</li> <li>■ Student activities created an augmented space consisting of physical objects as well as the didactic objects/items they produced.</li> <li>■ During these informal situated learning experiences, students discovered different sources of information, different ways to extract, elaborate, construct and store the knowledge.</li> </ul>
<b>Impact on Learning</b>	<ul style="list-style-type: none"> <li>■ Students acquired competences in using online educational tools.</li> <li>■ Promoted collaborative knowledge construction and improved abilities to work in a group.</li> </ul>
<b>Lesson Learned</b>	<ul style="list-style-type: none"> <li>■ Schools generally consider outside activities difficult to manage. Teachers reportedly claimed that there was "disorder, complexity and a wealth of stimuli" in the spaces chosen for the activities.</li> <li>■ Activities also took place in settings with limited internet connections.</li> </ul>

## National Examples

### FutureSchools@Singapore

FutureSchools@Singapore aims schools to lead the way for others by providing possible models for *“the seamless and pervasive integration of ICT into the curriculum for engaged learning in schools.”*

#### Case Study - FutureSchools@Singapore

<b>Aim</b>	Encourage innovation and enterprise by integrating information and communication technologies and interactive digital media in schools
<b>Date</b>	2007 to present
<b>Scale</b>	8 schools as of April 2011, projected to include 15 schools by 2015 (5% of schools in the country)
<b>Partners</b>	MoE, Infocomm Development Agency, local industry partners
<b>Technologies</b>	PCs, digital textbooks
<b>Segment</b>	Primary and Secondary school students and teachers
<b>Funding</b>	Central funding from MoE and the Infocomm Development Agency
<b>Description</b>	<ul style="list-style-type: none"> <li>■ Each school chooses a strategy based on infrastructure and technology available. For example, Beacon Primary School created an interactive 3D Virtual Learning Environment called Beacon World. Learners can immerse in 3D learning environments that support the school’s customised curriculum.</li> <li>■ Schools also collaborate with industry partners and serve as test-beds for research and development.</li> <li>■ Schools expected to enhance existing curriculum and pedagogies by developing ICT-enabled pedagogies and redesigning curriculum and assessment strategies.</li> <li>■ Content is developed locally by industry partners.</li> </ul>
<b>Impact on Learning</b>	■ The MoE in Singapore reports that initial findings from schools show higher levels of student engagement and deeper learning that support the development of 21st century competencies, such as self-directed and collaborative learning.

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### e-Learning Trials - Australian Flexible Learning Framework

Australia's e-Learning trials aim to develop guidelines and standards for emerging technologies including iPods, iPhones, e-Books and virtual worlds. The project will provide the vocational education and training (VET) system with new types of technologies to explore how they can facilitate more flexible and engaging teaching and training.

#### Case Study – e-Learning Trials in Australia Flexible Learning Framework

<b>Aim</b>	Explore how new technologies can facilitate more flexible and engaging teaching and training, particularly through mobile and remote learning
<b>Date</b>	2008-present
<b>Scale</b>	17 trials in vocational education and training institutions since 2008
<b>Partners</b>	Australian Flexible Learning Framework, Centre for Learning Innovation (CLI), vocational education and training institutions.
<b>Technologies</b>	iPods, iPhones, e-Books and virtual worlds
<b>Segment</b>	Vocational education and training (VET) system
<b>Funding</b>	Australian Flexible Learning Framework
<b>Description</b>	<ul style="list-style-type: none"> <li>■ Each institution uses a different type of technology to deliver training:                             <ul style="list-style-type: none"> <li>– New England TAFE promotes access to virtual training rooms on iPhones in order to interact directly with their trainers by text, voice and video,</li> <li>– TAFE SA Adelaide North uses electronic versions of printed books (e-Books) to provide streamlined training.</li> </ul> </li> <li>■ Each institution provides its own assessment of the initiative and identifies areas where future standards work may be required.</li> <li>■ Teaching methods vary depending on the technology chosen.</li> </ul> <p>Example project:</p> <ul style="list-style-type: none"> <li>■ Western Sydney Institute and DET NSW Centre for Learning Innovation's:                             <ul style="list-style-type: none"> <li>– Aimed to benefit on-the-job learners by delivering learning content, formative assessment tasks and evidence gathering via mobile devices.</li> <li>– Developed a platform to: create simple content including basic and rich media, navigate to contextually relevant content using 2D barcodes attached to objects in the field, transport cost free data, upload and store information including learner responses to quizzes and evidence in the form of photographs, voice and video, etc.</li> </ul> </li> </ul>
<b>Impact on Learning</b>	<ul style="list-style-type: none"> <li>■ Most trials demonstrate the benefit of combining different types of technologies.</li> </ul>
<b>Challenges</b>	<ul style="list-style-type: none"> <li>■ Wireless networking provided a simple, no-cost means of delivering content to mobile devices with sufficient data transfer speeds.</li> <li>■ Several technical challenges were expressed by different institutions conducting trials which varied depending on the device being used.</li> </ul>

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

- 1 Introduction
- 2 Summary of Main Themes
- 3 Background to the Development of Mobile Education
- 4 Market Size and Potential
- 5 Commercial Players
- 6 Textbook and e-Textbook Publishing
- 7 Appendix

### Other National Examples

- **Ireland** The FÓN project (Foghlaim Ón Nuatheicneolaíocht/Learning through new Technologies) promotes the use of mobile phones and networked computers for teaching, learning and assessing Irish at post-primary level. The programme aims to increase the level of oral fluency in Irish by providing students with mobile phones to support them in language classes. The mobile phones were used in three ways: first, to send vocabulary SMS to students daily; second, to facilitate students to dial up to a voice-response system where they left recorded responses to their teacher's questions; third, to facilitate students to dial up to a voice-chat with another student in their class, in the same school or in another school. The chat is based on a teacher's task which the students received when they are paired up with their chat partner.
- **European Schoolnet**<sup>1</sup> identified 33 initiatives to implement 1:1 provision of netbooks in schools, in 18 countries: Austria, Czech Republic, Estonia, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Spain and the UK. The largest initiatives were in Czech Republic, Estonia, Greece, Norway, Portugal, Spain and the UK. As well as larger national initiatives, which include laptop/netbook provision, we can see the emergence of a high number of smaller-scale scattered initiatives, mainly research pilots and individual school initiatives, e.g. in Germany, Austria and the Netherlands.

### 7.2 Example of e-Educational Apps

- **Vocabulary Central from Pearson. (for iPad and iPod touch)** for each grade from 6–12, an app with flash cards, songs, and trivia games to help students learn vocabulary.
- **Encyclopedia Britannica Kids: Ancient Egypt (for iPad and iPod touch)** for ages 8-12 to learn about Egypt with videos, images, and interactive maps and games. (Volcanos and Dinosaurs are topics of other apps in this series).
- **Frog Dissection from Emantras Inc. (iPad)** scientifically accurate and easy-to-use frog dissection app.

- **Starfall ABCs from Starfall Education LLC (for iPad and iPod touch)** for younger students, including English language learners, to see, hear, and interact with letters and sounds in words, sentences, and games.
- **Math Bingo from ABCya.com LLC (iPad and iPod touch)** game to practice addition, subtraction, multiplication, and division skills, with three different levels of difficulty.
- **Time, Money & Fractions from School Zone Publishing (for iPad)** animated activities for first and second graders; includes audio guides, instant grading, and progress-tracking.
- **Clicker and eClicker Host from Big Nerd Ranch, Inc. (iPad and iPod touch)** polling software that can be used to pose questions to the class with eClicker Host that they answer with eClicker app on their iOS devices.
- **Wolfram|Alpha from Wolfram Alpha LLC (for iPad and iPod touch)** a comprehensive reference app that provides instant answers to all sorts of questions on any topic.
- **Pearson AlgebraPrep from Modality Inc. (for iPad and iPod touch)** ten apps for review, practice, and test preparation for algebra; includes practice tests and instructional videos.
- **The Elements: A Visual Exploration (for iPad) and The Elements for iPhone 4 (for iPod touch) from Element Collection** visual interactive periodic table app with 360-degree views of elements and related objects and a wealth of engaging information; iPad version is 3D viewable with 3D glasses.
- **National Geographic GeoBee Challenge** a fun way to test your knowledge of world geography; includes beautiful maps from National Geographic.
- **iHomework from Paul Pilone** organization aid with which students track assignments, store class and teacher information, calculate course grades, and set reminders for themselves.

### 7.3 Exchange Rates

In this report, all values are given in national currencies, with corresponding figures in US\$. The exchange rates used are sourced from the OECD and are as follows:

Table: Exchange Rates – National Currency Per US\$

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
□	1.09	1.12	1.06	0.89	0.80	0.80	0.80	0.73	0.68	0.72	0.75	0.72	0.72
£	0.66	0.69	0.67	0.61	0.55	0.55	0.54	0.50	0.55	0.64	0.65	0.63	0.63
Yen	107.83	121.48	125.25	115.94	108.15	110.10	116.35	117.76	103.39	93.57	87.51	81.39	81.39

<sup>1</sup> Netbooks on the Rise: European Overview of National Laptop and Netbook Initiatives in Schools, Insight Observatory for New Technologies in Education, Nov 2010 [http://cms.eun.org/shared/data/pdf/netbooks\\_on\\_the\\_rise.pdf](http://cms.eun.org/shared/data/pdf/netbooks_on_the_rise.pdf)



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