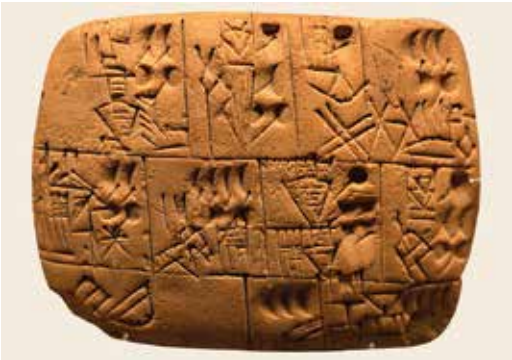
Pen2Paper


# The Impact of Printing

## on Education

The roots of the word 'education' are found in a Latin verb, *educare* which means 'to lead out' suggesting that at its heart, schooling is about drawing from within a young person a range of skills and abilities with which to lead a full life and make a contribution to the wider world. In the prehistoric and pre literate world, these skills would have been limited to those which were essential for survival and particular trades or abilities would have been passed from parent to child thus negating the need for any formal schooling.

It is widely accepted that the first writing system was developed by the Sumerians in approximately 3400-3200BC. It is known as cuneiform and was still in use until 75 AD. The Sumerian people lived in what is now southern Iraq and were enthusiastic traders and book keepers. It is possible that their interest in record keeping led to the development of the cuneiform script beyond the use of symbolic pictures. The word cuneiform means 'wedge-shaped' and relates to the shape of the letters that were carved into clay tablets using a reed as a stylus in place of a pen.



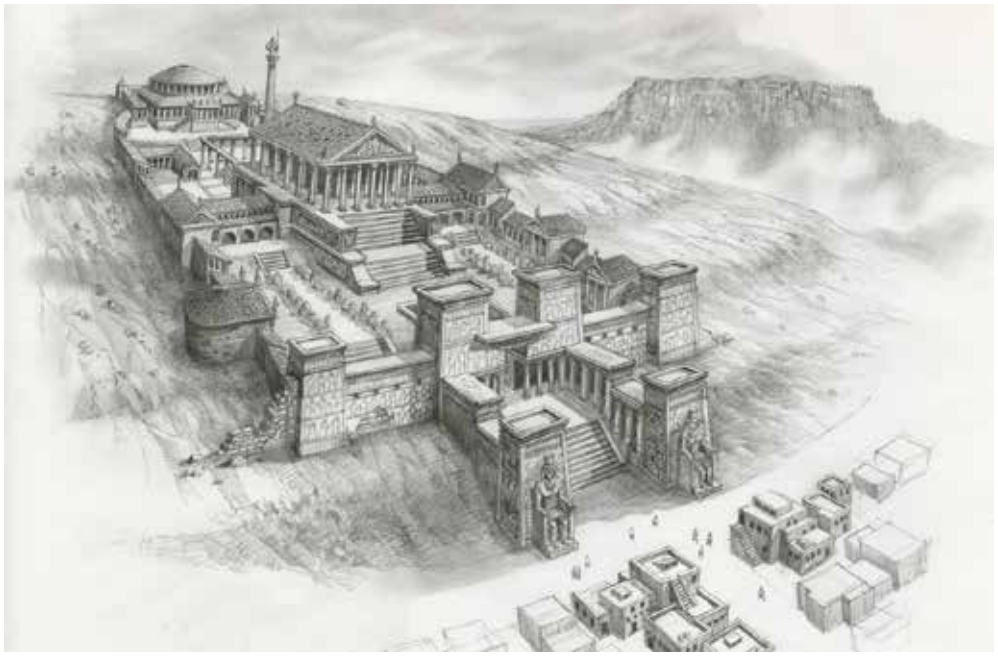
The invention of writing systems had a profound effect on teaching methods which previously relied upon the wisest in the community imparting his knowledge and understanding to others. This informal teaching could take place anywhere, relying solely on oral history. There are no records of formal education taking place before the invention of writing systems, but evidence suggests that within 1000 years, schools existed in both China and Sumer where Cuneiform Mathematics text books (from around 2000 BC) have been discovered.[i]

By the 7th century BC, the collection of written materials in vast libraries emerged amongst those kingdoms where many writing systems had originated, such as Assyria and Egypt. The library at Ninevah, was discovered in the 1850s and contained more than 30,000 cuneiform tablets;

"Alongside historical inscriptions, letters, administrative and legal texts, were found thousands of divinatory, magical, medical, literary and lexical texts. This treasure-house of learning has held unparalleled importance to the modern study of the ancient Near East…"[ii]

There is also evidence that the library contained workshops for copyists and conservationists which suggests that the preservation of texts was recognised as

important. The great library of Alexandria is often referred to as the first major seat of learning, housing more than half a million volumes. The Egyptians were so enthusiastic in their collecting of new texts, that all visitors to Alexandria would have their books confiscated for copying, with the original being retained in the library and a copy returned to its owner.



It was the Greeks who were known for their enthusiasm in education with formal schooling for boys aged 8 to 16 during the Age of Pericles (455- 431 BC). Students were instructed in a range of subjects as well as receiving a moral education. It seems unlikely however that written materials were used at this primary education level as the works completed at this time, such as plays by Aristophanes would be unlikely subject matter for young children. A more popular choice for children has been found from this time, written on papyrus. Aesop's Fables were however enjoyed only by adults and specific books written for children were a much later creation.

## School starts in England


The beginnings of a school system in England coincided with the arrival of St Augustine to England at the end of the 6th century AD. Over the next millennium, many religious and grammar schools as well as universities were established for the wealthy and those considering a vocation. Following in St Augustine's footsteps, St Bede played a very important role in for both education and writing as one of the greatest Anglo Saxon scholars. St Bede was born in Northumberland in c.673 AD. He was ordained a deacon at 19 and wrote over 40 religious works including The Ecclesiastical History of the English People and a book on Natural Sciences for use with children.

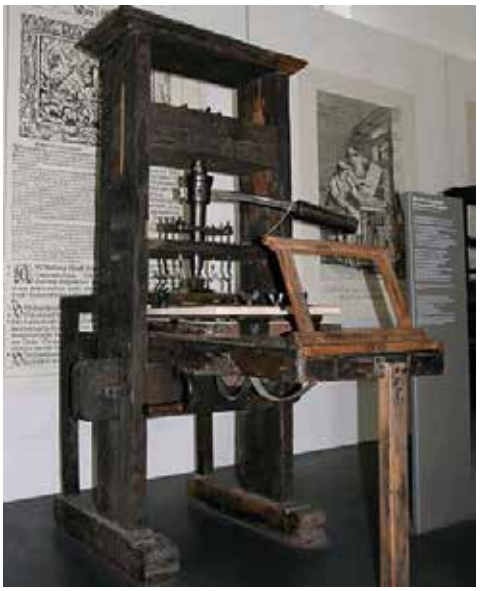
There is evidence of further teaching books for children written in the 11th and 12th century, including an encyclopaedia for children written by St Anselm. It seems however that these books acted as a teaching tool rather than reading material for the children themselves. This may be largely due to the significant cost and effort required to produce each copied manuscript. Another significant historical text was the Babees Book which was written shortly before the invention of the printing press and served as an instruction manual for children of noble birth who acted as pages within royal palaces and castles and included lengthy descriptions of appropriate behaviour for young servants in the presence of their superiors;

" The 'Babees' are exhorted to salute their lord; to hold up their heads and kneel on one knee; to look straight at whoever speaks to them; to answer sensibly, shortly, and easily; to stand till told to sit; to keep head, hands, and feet quiet; not to scratch themselves, lean against posts etc." [iii]

In addition to the financial and production challenges of copying manuscripts, the lack of books written for children can also be attributed to the fact that the majority of written material copied was usually only available in Latin. The rise of vernacular texts only came about some time after the invention of the printing press as prior to this time, literacy in Western Europe was often judged by the ability to read and write in Latin.

## The Book enters the Industrial Age

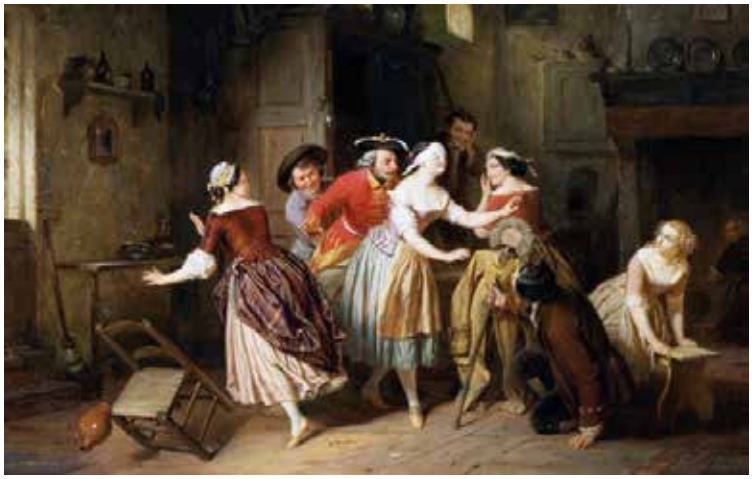
Scholars assert that Johann Gutenberg would have spent at least ten years inventing his moveable type printing press which he used to produce between 160 and 180 copies of the famous Gutenberg Bible in 1455. Within 25 years, every western European city housed a printing workshop and a further 25 years saw an estimated 15 million books printed.[iv] Whilst the tradition of telling stories to children has existed since the early hunter-gatherer communities, specific books for children to read did not emerge until the Georgian era from the late 18th to early 19th century.



It was John Locke, the famous Enlightenment philosopher, who first suggested in 1693 that children should be given books to read for enjoyment. The commonly held belief at the time was that children were simply adults in miniature that needed to be preached to and instructed. They were not

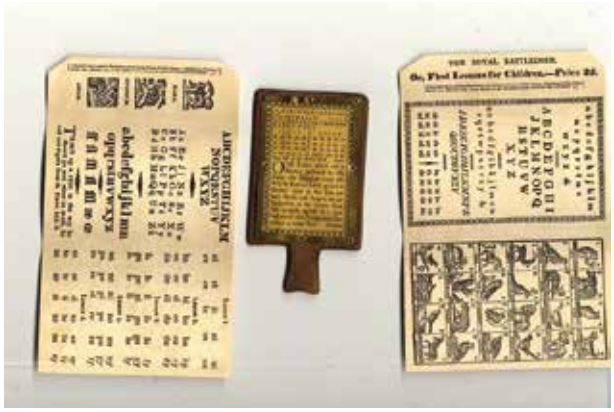
ready for entertaining or independent thinking and Locke's notion of books specifically for children was considered nonsensical.

It was the Victorians who began to delight in entertainment and recreation time in their own homes with games, music and a wide range of literature including satire and cartoons. Peter Taylor, in his history of writing for children [v] suggests that this interest in light entertainment and delight in children could be as a result of their new found wealth post Industrial Revolution. It is during this time that many of the great works for children were penned, starting with the nonsense verse of Edward Lear, the Grimms Fairy Tales and Alice in Wonderland.



## Hornbooks and Battledores - The beginnings of print in schools

Whilst formal compulsory schooling did not begin in England until the 1880s, printed material in English schools first appeared soon after the Gutenberg Bible with the emergence of the hornbook. This was an early example of a primer or reading text for beginners and consisted of a single sheet of vellum (and in later times, paper) that contained the letters of the alphabet or some simple religious text such as the Lord's Prayer. The page would be mounted onto a frame made from wood, stone or leather and then protected with a very thin transparent layer of horn, which acted as laminate to protect the text from damage at the hands of young students. The frame would also have a handle and would often be worn either around the waist or neck of the child so that it could be referred to as needed during study.



By the end of the 17th century, there were more than 150 working paper mills in England and so the hornbook began to evolve into a sturdy tri-folded cardboard leaflet known as a battledore. These were able to contain far more information that the single paged hornbook. The name 'battledore' came from an early form of badminton which was played with a racquet that looked very similar to the horn-book and thus this seemed an obvious name for its replacement.

## Primers and Readers - the Birth of the Textbook

The next step towards the textbook in the classroom came with the development of the primer. In the United States, the New England Primer was first introduced in the late 1680s. It consisted of 90 pages containing exercises and rhymes designed to help children learn their alphabet as well as the structure of common syllables. It also contained many scriptural verses and short illustrated rhymes to ensure that religious instruction took place alongside literacy development. Primers were still in use in some parts of America in the 20th century.

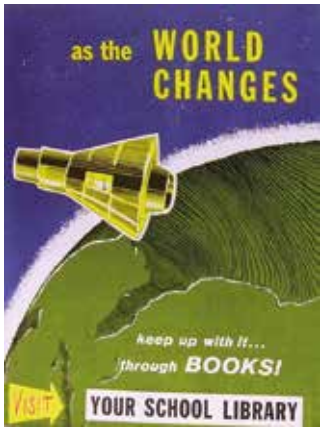
Primers were joined by readers in the mid-19th century with the most famous example from the United States being the McGuffey Readers. These were a series of simple reading books written for pupils to use as they progressed through the grades at school; with one text suitable for each grade. The McGuffey Readers were still very popular until the 1960s, selling in excess of 122 million copies since 1838. [vi]

The early printed teaching materials demonstrate a close relationship between religious instruction and schooling in England. As many schools were led by local parishes, there was a belief that the morals of the children would be improved by their ability to study Biblical passages for themselves. Historian Harvey Graff also asserts that introducing schooling for all children was to control the types of literature that the working classes were able to access. There seems to have been a fear in the 19th century that learning to read and write in more informal settings could lead to a radicalized population; providing school places for all enabled the control of literacy as a priority over its dissemination. [vii]

## The Growth of the School Library

Libraries and educational establishments share a long and rich history but libraries in smaller schools seem to have only developed in the late 19th century at a similar time to the introduction of compulsory primary education in England. [viii] Whilst there is very little available data on the usage of early school libraries, it is generally accepted that a school library which provides children with books to read for pleasure and independent learning are a 20th century development.

The 20th century saw development in both the breadth of the school curriculum as well as the usage of textbooks and school libraries. The close relationship between textbooks and the curriculum is obvious with local school boards able to choose appropriate teaching materials for a more uniform approach to teaching in their schools.




## The Third Age of Information

Whilst the printing press has had an immense impact on education the digital age has also revolutionised teaching and learning. In their book, Information Ages: Literacy, Numeracy and the Computer Revolution, Michael Hobart and Zachary Schiffman describe history in terms of three information ages; each dawning with incredible breakthroughs in technology. The first information age began with the birth of writing, the second age with the invention of the printing press and the third with the inception of the internet. [ix]

It could be suggested that this digital age in education began with the introduction of the humble overhead projector into classrooms in the 1960s. Prior to this, pupils and teachers relied upon textbooks and a lowly chalkboard for educational inspiration. At the same time as these technological advances were taking place, educational theorists were developing a greater understanding of how learning takes place. William Glasser, a leading psychologist and education expert explains this in his summary of how we learn and retain information; we remember:

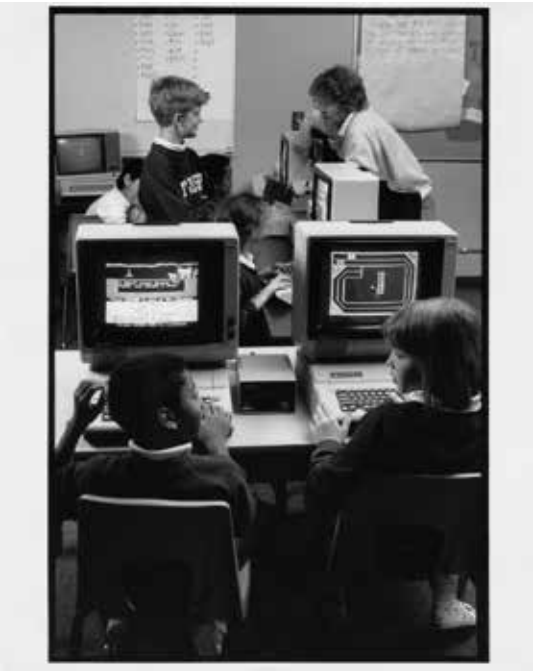
"10% of what we read
20% of what we hear
30% of what we see
50% of what we hear and see
60% of what we say (repeating what we have heard and seen)
70% of what we do (practicing what we have heard and seen)
90% of what we hear, say, see and do"[x]

The significance of this should not be underestimated; it clearly suggests that the most effective teachers do more than just lecture pupils and provide them with printed material to memorise. Technological advances such as the OHP, and later the photocopier, enabled teachers to be more creative in their planning and resourcing of lessons. It was no longer essential to rely upon resources provided in textbooks and this marked the beginnings of a differentiated curriculum, catering to the educational needs of individuals rather than assuming all pupils of the same

age learn at the same rate. Prior to this, those teachers who wished to create their own resources for use in the classroom were required to create these by hand and ensure they would be large enough or plentiful enough to be viewed by the whole class.

## Information & Communication Technology

The emergence of computers in schools faced many challenges in the 1980s and early 1990s as schools struggled to keep up with rapidly developing technology and limited budgets as well as deciding the purpose of computers in an educational environment. In a relatively short period of time, Information and Communication Technology became a vital subject for both teachers in training and pupils. The transition from computer labs where pupils were taught the language of programming to classrooms equipped with computers to enhance teaching and learning began as ICT was introduced into the National Curriculum in 1995. By 1997, specialist teachers of ICT were being trained to teach the subject independent of the Technology department where it had previously been located and within two years the Department for Education indicated that all subjects were responsible for teaching ICT. By 2001, the DfE had introduced an ICT test for all teachers in training in response to concerns about a lack of basic skills in the subject. This was abolished in 2012 as a reflection of the integral role of computing and digital technology in society today.



Access to computer programmes, the internet and a vast range of technological innovations such as interactive whiteboards and Virtual Learning Environments have revolutionised teaching and learning to the point that 'chalk and talk' lessons reliant solely on textbooks are becoming a thing of the past. School libraries have embraced new technologies and many are now known as learning resource centres or media centres. In addition to traditional books, some schools have invested in e-readers and other technologies which enable the use of digital media.

**"That encyclopaedia is old, there's no way that stuff can still be true…"**

It has to be acknowledged that many pupils today have ICT skills which may exceed those of their teachers; but not yet have the discernment necessary to

harness these skills appropriately. The biggest shift has come in the perception of the validity of information amongst young people who will often doubt the authority of the printed word whilst willingly trusting anything found on the internet. Evidence of this is seen in an ICT teaching activity often given to younger pupils who are asked to research the 'tree octopus' and the bid to save it from extinction. When typed into Google, pupils can find numerous images and a website explaining the creature's origin and current plight. [xi] In a scene reminiscent of the fairy tale, The Emperor's New Clothes, it is astounding to observe many children blindly accepting the information on the screens in front of them.

## Socrates and the Digital Age

There seem to be distinct parallels between the dawning of the age of writing and the digital age. There was great suspicion amongst important scholars, including Socrates that the age of writing would bring about the death of education and genuine intelligence amongst students; the implication that the written word would supersede the authority of the teacher. Authors of early manuscripts often remained anonymous and written content could be changed by the copyists (not unlike Wikipedia today) as copyright first came into effect in 1709. Money was not to be made by writing original content but in the recreation of it for the 'mass market'.

An early reference to children learning to read and write and appropriate methods and materials used by teachers is found in the writings of Quintilian at the end of the 1st century AD. Children were given small wax tablets and a stylus with which to practise forming their letters. The image of a young child learning to form letters in this way is reminiscent of many pre-schoolers today reaching for a smartphone or tablet (with one of the many educational apps available) to shape their first attempts at the alphabet, knowing just as their Roman predecessors before them, that one touch of the stylus can keep any errors a secret.

Despite our love affair with technology, the language of the digital age is still bound up in the age of printing as highlighted in an article from the Manchester University Library website. [xii] We still search through pages on the internet and scroll through great volumes of online text. The human eye still prefers to read black text on a white page after centuries trained at reading from a printed book and designers of digital typefaces still consult examples from the 15th and 16th centuries.

Many teachers today fear the same lack of educational control in the classroom as Socrates did more than 2500 years ago as pupils develop the skills of discerning the validity and authority of material found on the internet. At the same time, those in education rejoice in the wealth of opportunities that the digital age has provided from video conferencing with schools on other continents to being able to access online copies of the Gutenberg Bible to enable pupils to understand the beginning of the remarkable journey of the printed word.

The printed word has enabled an incredible journey for education; from the humblest of beginnings with the wisest member of a community able to impart his knowledge on those few young people who lived close enough to listen to a digital virtual classroom where 2.77 billion people are able to share their views, experiences and knowledge at any time from any place in the world [xiii] .

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(i) Cited on History of Education Timeline from http://edhistory.com/

(ii) Taken from the British Museum website located at http://www.britishmuseum.org/research/research_projects/all_current_projects/ashurbanipal_library_phase_1.aspx

(iii) Quotation taken from C M Hewins The History of Children's Books located at http://www.theatlantic.com/magazine/archive/1888/01/the-history-of-childrens-books/306098/

(iv) Statistics cited at http://www.library.manchester.ac.uk/firstimpressions/-From-Manuscript-to-Print/Early-Printed-Books/Who-were-the-readers-of-early-printed-books/

(v) Peter Taylor – The Writing and Illustration of Children's Books located at http://www.writing-for-children.com/history.html

(vi) S Smith, 2008, McGuffey Readers located at http://digitalcommons.liberty.edu/educ_fac_pubs/101

(vii) Harvey J Graff The literacy myth: cultural integration and social structure in the nineteenth century, 1991, p24. Originally cited at http://en.wikipedia.org/wiki/Literacy

(viii) L Clyde, 1981, The magic casements: a survey of school library history from the eighth to the twentieth century, James Cook University located at http://eprints.jcu.edu.au/2051/13/02Chapter1.pdf

(ix) M Hobart & Z Schiffman, Information Ages: Litarcy, Numeracy and the Computer Revolution, 1998, Johns Hopkins University Press as cited in H Boelens The Evolving Role of the School Library and Information Centre in education in Digital Europe, 2010 located at https://eprints.mdx.ac.uk/7329/1/BoelensThesis-Final_2010.pdf

(x) W. Glasser, - http://www.wglasser.com/who-we-are

(xi) For more information, visit http://zapatopi.net/treeoctopus/

(xii) Located at http://www.library.manchester.ac.uk/firstimpressions/-From-Manuscript-to-Print/The-Explosion-of-Print/The-legacy-of-the-explosion-of-print-today/

(xiii) estimated global internet users for 2013 – statistic taken from http://www.itu.int/en/Pages/default.aspx

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