

MULTIMEDIA IN EDUCATION AND IN LANGUAGE TEACHING: UK AND AMERICAN EXPERIENCE

Abstract: *The article deals with the UK and American experience of multimedia evolution the roots of which can be traced as far back as the 15th century. The current Information Technology trends in British education are presented and followed by the two different academic opinions on the history of multimedia in language teaching. The article concludes with the key areas that require further attention in the UK and American education sector.*

Key words: *multimedia in education; multimedia in language teaching; Information Technology (IT); Computer Assisted Language Learning (CALL).*

The history of humanity is a never-ending saga of constant aspiration to conquer scientific challenges and a monumental testimony of the colossal achievements on the path to impressive technological heights. Nowadays, one can easily send a message that would be received instantaneously by a recipient across thousands of kilometres; one can visit foreign countries without even the need to travel; one can speak and even see the other person being half way across the world. How did we get to this point with technological advancements in multimedia which could have been perceived as a miracle to the most educated person only a century ago?

To give it justice, it would be fair to name at least a few achievements in printing, processing, audio, telecommunication, video, animation etc that truly shaped the modern world and led to what is now known as multimedia:

Year	Event
1440	Gutenberg and Caxton's creation of the printing press
1780	Benjamin Franklin's invention of electricity
1837	Samuel Morse's development of the first telegraph receiver and transmitter
1876	Alexander Bell's invention of the telephone
1888	Louis Le Prince's launch of the first silent film
1928	Disney's release of the first cartoon with a fully synchronized soundtrack
1931	Konrad Zuse's creation of the first basic calculator
1939	Atanasoff's and Berry's design of a prototype computer which became the first automated digital computer
1957	The launch of Sputnik
1971	Ted Hoffs' creation of the Intel chip which meant that computers could be owned privately by individuals due to a significant reduction in computer's size
1972	Ralph Baer's development of the first commercial video game;
1978	The emergence of the first commercial cell phone in North America
1979	Sony's release of the first portable audio cassette player
1982	The use of computer – generated graphics in movies
1990	The birth of the World Wide Web and the announcement of the hardware specifications for multimedia platforms
1994	The beginning of interactive internet: online shopping, online banking etc.

So, here we are being the citizens of the global high-tech society where everyone and anyone is expected to be fluent with computers and internet. After all, the 21st century is the age of digital era with the children being “the first truly digital generation” (The Guardian newspaper, 2012). A wealth of online resources is easily available at our fingertips: games, pictures, videos, music and books that young generation can access effortlessly enabling them to become natural computer and internet users. However, this is yet to be the ultimate goal of the contemporary European society as far as multimedia and technology is concerned. For instance, the UK government are considering giving children the training and the necessary tools to enable them to not only become effective technology consumers but also to become technology builders able to create games, websites and other applications. In short, the aim is to foster a new generation of creative programmers of the global society.

According to the UK-based YouGov Survey, 75 percent of young children want to learn how to make games, applications and websites but in reality only 3 percent of children have the programming skills to achieve this. On the one hand, such a digital deficit is partially explained by the constraints of the modern school curriculum which primarily focuses on office package processing limited to Word, Excel and Power Point. On the other hand, such limitations are also explained by the shortage of the IT-skilled teaching staff qualified to deliver programming to children of all ages in the context of any subjects either be it science, foreign languages or any other subject.

The current state of affairs is such that the leading educational organisations in the UK are tasked to develop the curriculum to keep Britain at the forefront of the modern technological developments. In line with this endeavour, some educational institutions such as the British Royal Academy of Engineering and the Chartered Institute for IT recommend teaching principles of computer science and digital literacy to the children starting from a very young age. In general, it is already broadly recognised that computer programming and coding are both academically rigorous as well as fun disciplines and as such they are gradually finding their way into the UK schools.

As the new curriculum is being devised, there are already a few very successful pilot schemes where computer science and digital literacy are taught to children of all ages in Great Britain. The Code Club is one such outstand-

ing example of an after-school scheme for children aged 9 – 11 with as many as 425 centres across the UK run at local primary schools or community centres teaching basic computer coding. Another example of a progressive endeavour to foster a new generation of computer savvy users is the London Zoo working with Mozilla and other IT companies to engage children in digital creativity through their love of animals. So, a 225,000 pounds Digital Makers Fund has been created for children aged 4 - 18 to encourage young peoples' interest and participation in digital creation. So, all the above proves the determination of the UK government to give the children the skills required to pioneer the novel watershed achievements shaping the next generation of young people.

The reality of our global society these days is that education goes hand in hand with multimedia. On the one hand, many key technologies and uses are being pioneered in education. On the other hand, education is a major source of demand for multimedia resources. We can confidently say that the future generations of multimedia developers are fostered within the education sector and as part of their learning they are being exposed to the technology and skills which most certainly prepare them for the use of multimedia in other fields of life.

So, that's the current reality of the British society, but how did it all start?

From the outset, the American and European teaching communities recognised the potential significance and impact of technology on learning and teaching which resulted in a number of multinational projects being initiated as far back as 1970s – 1990s.

In the UK, for example, major governmental funding of about 75 million pounds supported various projects as part of Teaching and Learning Technology Programme (TLTP). The 76 projects formed as part of TLTP focused on developing a range of learning technologies in a variety of subjects: science, mathematics, computing, arts, humanities, social sciences, engineering etc. Resources developed by the project teams included materials for tutorials, revision materials, cognitive and communicative tools. The resources were subsequently made available to the rest of the teaching community for active professional use. From the very beginning of this undertaking, an increasing demand for high quality teaching resources was said to be the biggest challenge to the project.

Furthermore, the European Commission also supported a European project called PEDACTICE which was aimed at introducing educational multimedia into schools under consideration of lifelong learning. As part of this project, several evaluation studies and initiatives were conducted and consequently resulted into a European Multimedia Resource Library database. The intention was to develop a

broad pool of educational resources for teachers with the database open to registered users in order to provide an international forum for the communication of experience and best practice.

These projects alongside many other initiatives have made significant contributions to the development of technology and applications of multimedia in education. These initiatives proved to be a substantial factor in a profound restructuring of educational system and in the development of technology-focused priorities world-wide.

In its development, educational multimedia has gone from the point of having scarce resources to the point where a broad range of materials became easily available so that there would be no need for teachers to create their own multimedia content. A breadth of information is now available on internet with some content in the public domain which can be easily used by anyone without any restrictions. Some other content may be accessible via subscription only. Moreover, various educational software and programs can be either downloaded free of charge or can be purchased from the developers.

During its short but rapid growth, educational multimedia expanded so much that it is now actively used in basically all areas of education regardless of the subject, age group and type of pedagogical aims. It is now used in the following areas:

- Pre-school;
- Primary;
- Secondary;
- Higher education;
- Special needs;
- Vocational;
- Continuing vocational and professional;
- Recreational;
- Self-study.

Furthermore, depending on the educational aims, availability of teaching resources and other constraints, each of the above categories can be delivered in different formats and can be applied either on its own or as a combination in a subject-based context:

- Individual learning;
- Teacher-mediated learning;
- Classroom learning;
- Team learning;
- Project learning;
- Distance learning.

As it can be seen, educational multimedia has penetrated every single area of pedagogy and has developed to become a powerful instrument in the hands of the modern sophisticated society.

So, what is multimedia and what benefits does it bring?

In a nutshell, multimedia can be defined as a combination of media and content with the end user either passively perceiving the information (for example, video instructions) or actively driving the delivery (for example, video games). The educational substance (ie content) is conveyed via text, audio, still and animation images, video (ie media). Basically, multimedia can be anything that aids and enhances the end users' learning experience: audio and video recordings; online presentations; TV and radio or broadcast programmes; computer software and hardware; CDs; distance learning packages; online publications; hypertext mechanisms for cross referencing; games. It is understood that as technology develops even further, new priorities, motivations and the needs of an ever-evolving society will drive the application of the available multimedia resources open to learners, teachers, institutions and society.

It is obvious that there is a multitude of advantages in using multimedia in education compared to a classical lesson delivery where a teacher is in the centre of a lesson using static textbooks, blackboard, pictures, notebooks etc.

Multimedia:

- allows for a greater variety of information to be delivered during a lesson efficiently and effectively;
- enables the lesson content to be presented in condensed and concentrated way;
- permits a greater flexibility in adopting a delivery and a lesson content to the needs of individual students;
- facilitates a user-centred teaching approach where a teacher is no longer the main driver, but instead a facilitator and problem-setter;
- enhances learning and most importantly retention experience;
- motivates students given that it introduces the excitement of contact with unusual non-routine environments.

So, the above depicts the history, the potential and the implications of using multimedia technologies in the education overall. But how about multimedia application to language learning in particular?

As multimedia resources developed, the role of computers in language learning has gained a central attention. So, leading scholars throughout the world attempted to align language learning, theoretical pedagogy and psychology with the modern advancements in multimedia.

Mark Warschauer, a Professor and an Associate Dean at the University of California, USA proposed and substantiated his vision of the concept and the evolution of multimedia in language learning which he called CALL (Computer Assisted Language Learning). So, according to Warschauer, language learning progressed in line with the three main phases of computer evolution: the main frame

computer, personal computer, and networked multimedia computer. He believes that the shift in computer usage in the field of language teaching was driven by structural, cognitive and socio - cognitive environments. So, he identifies the following distinct phases of Computer Assisted Language Learning: behaviouristic CALL; communicative CALL; integrative CALL where each new phase is thought to have incorporated the achievements of the preceding stage.

In 1950s – 1970s when behaviouristic approach to language learning dominated educational theories, “repetition being the mother of learning” became a guiding principle. A computer was viewed as an ideal medium which could easily facilitate (1) endless drilling and repetition; (2) immediate feedback; (3) perfect environment for students to proceed at their own pace. Hence the use of computer programs which allowed for vocabulary and grammar drills with some grammar explanations as main computer exercises. At this stage, multimedia was used as means to achieve language accuracy.

In 1980s communicative approach became prominent. Supporters of this approach believed that the drill and practice programs of the previous decade did not allow for authentic communication. While in the preceding phase of CALL the focus was on remembering and drilling of structures and forms, 1980s witnessed a shift of attention to the actual usage and application of such structures. It was recognised that using the target language called for the creation of an environment necessary for efficient language learning. Hence, computer exercises of this period were aimed at practicing language skills in a non-drill format such as programs for paced reading, text reconstruction and language games. Moreover, computer was also used to stimulate and to motivate students to discussions, writing and critical thinking. So, the aim was to achieve fluency and independence of opinion in the target language.

With the birth of Internet as well as hypermedia and multimedia computers, communicative approach no longer met the learning needs of the modern society. Technological advancements (CD-ROM) meant that the learning experience could be more authentic and complete as listening could be combined with seeing. Moreover, not only could the students learn at their own speed but also in their own way where they could make choices depending on their interests allowing them to be in control of their learning. Computer exercises of this phase allow for simulations of different true-to-life scenarios (such as grocery shopping, taking a taxi etc). This is the phase where contextual learning prevails.

Below is a consolidated summary of Warschauer's three stages of CALL:

Table 1

Warschauer's three stages of CALL with adjustments
(Warschauer, 2000)

Time frame	1950s - 1970s	1970s - 1980s	1980s - Present
Psychological angle	Structural (a formal structural system)	Cognitive (a mentally constructed system)	Socio-cognitive (developed in social integration)
Phases of CALL	Behaviouristic	Communicative	Integrative
Computer development	Mainframe computers	Personal computers	Multimedia and Internet
Language teaching focus	Grammar, translation and audio-lingual	Communicative language teaching	Content-based
Exercises	Vocabulary, grammar drills with focus on remembering	A non-drill exercises for paced reading, text reconstruction and language games expected to stimulate discussion, writing, critical thinking	Games / simulators of real world scenarios putting a student in charge
The use of computer programs	Computer as a tutor for repetitive language drills	Computer as a stimulator for critical thinking, writing, speaking.	Computer as a platform for active interaction
Aim of multimedia usage in CALL	To achieve accuracy	To achieve fluency and independence of opinion	To put a student in control; contextual learning

A somewhat different interpretation of the CALL evolution is pictured by Stephen Bax, a Professor of the University of Bedfordshire, the UK. He argues for three new categories: Restricted, Open and Integrated CALL which also are in line with the development of multimedia.

Bax believes that in the period before 1980s both the teacher's role and the capabilities of computer technology of that time meant that language learning and teaching had a restricted nature. Therefore, closed drills and quizzes were the primary types of computer exercises with only two types of feedback such as true or false. In this period, there was typically minimal interaction amongst students during lessons. Multimedia was not an integral part of the curriculum but instead was an optional extra.

Over time at the stage of the Open CALL, technological enhancements allowed for a more open, flexible and communicative use of computer software as an aid in language learning. The role of a teacher changes from that of a monitor or observer in the Restricted CALL to that of a facilitator in the Open CALL. The focus here is primarily on computer-mediated communication allowing students to play language games and to use computer simulations.

There was also a minor shift in student activities: an occasional interaction amongst students in the class became a more frequent occurrence. At this stage, multimedia still was not integrated into syllabus.

Furthermore, Bax describes the stage of the Integrated CALL as "the stage when a technology is invisible, hardly even recognized as a technology, and taken for granted in everyday life" (Bax, 2003). In this phase, the teacher becomes a manager and ensures that students' interaction during the lesson is very frequent. Computers are found on every desk and in every bag and they become an integral part of the syllabus.

Below is a consolidated summary of Bax's three stages of CALL:

Table 2

Bax's Restricted, Open and Integrated CALL (Bax, 2003)

Content	Restricted CALL: Language system	Open CALL: System and skills	Integrated CALL: Integrated language skills work. Mixed skills and system
Type of task	Closed drills, quizzes	Simulations, games, computer-mediated communication.	Computer-mediated communication, e-mail.
Type of student activity	Text reconstruction; answering closed questions; minimal interaction with other students.	Interacting with the computer; occasional interaction with other students.	Frequent interaction with other students; some interaction with computer.
Type of feedback	Correct / incorrect	Focus of linguistic skills development. Open, flexible feedback.	Interpreting, evaluating, commenting, stimulating thoughts.
Teacher roles	Monitor	Monitor / facilitator	Facilitator, manager
Teacher attitudes	Exaggerated fear and/ or awe.	Exaggerated fear and/or awe.	Normal part of teaching - normalised
Position in curriculum	Not integrated into syllabus—optional extra. Technology precedes syllabus and learner needs.	Not integrated into syllabus—optional extra. Technology precedes syllabus and learner needs.	Tool for learning. Normalised, integrated into syllabus, adapted to learners' needs. Analysis of needs and context precedes decisions about technology.
Position in lesson	Whole CALL lesson.	Whole CALL lesson.	Smaller part of every lesson
Physical position of computer	Separate computer lab.	Separate lab—perhaps devoted to languages.	In every classroom, on every desk, in every bag

So, speaking about multimedia in language teaching and in education overall, what are those areas that nowadays require significant attention from the point of view of European and American teaching community?

There may be differing views to defining the milestones and trends of the multimedia development in education and language teaching; however, there is an unwavering consensus amongst European and American teachers and scholars that as the role of multimedia in education increases, policymakers, regional educational agencies and school administration should endeavour to sustain a continued focus on a number of crucial areas.

Firstly, it is the issue of resourcing. The American and European teaching communities recognise that the legislative focus on promoting the availability of a dedicated headcount for multimedia support in schools cannot be underestimated. It is a common sentiment that it is not enough to simply provide technology and content infrastructure. There has to be a social dimension where teachers could have confidence that they are not left alone with their formidable task of mastering challenging multimedia skills as well as going about meeting their day to day duties. Besides, policymakers should recognise that the use of multimedia and computer technology in schools is not the answer to issues of resourcing, motivation and standards of education. The introduction of technology does not resolve the existing problems but instead it emphasises the need for these issues to be addressed head on in a progressive and constructive way.

Secondly, it is the issue of dedicated multimedia support. There is a clear understanding within the European and American teaching communities that there is a pressing need to appreciate and reward teachers with multimedia expertise. They feel that the local experts should be given enough time to develop and reinforce their expertise as well as an opportunity within the school context to disseminate their knowledge and experience. These local experts know their schools, their teachers' needs as well as the range of products and their requirements - this is vital if multimedia is to be used in schools effectively.

Thirdly, it is the issues of teacher training. According to the European and American education sector, alongside having a local dedicated technology support, it is important to keep the momentum going and to foster the enhancements of multimedia literacy amongst individual teachers. Not only do they need to have a basic understanding of what multimedia can do in the classroom context, they should also be fully trained on the usage of key multimedia tools. Only in such a way will the teachers be able to relay their expert subject knowledge into the language of modern technology.

And finally, it is the issue of the right multimedia products. Thanks to the variety of multimedia projects and initiatives, there is already a breadth of different products available to teachers to aid in their subject areas; however, there is a lack of information, clarity and assistance around such products. So, according to the European training ex-

perience, teachers should be given an opportunity to test such supplementary products to explore their capacity for teaching, learning and retention. This means that sufficient time has to be set aside for teachers to engage with products and even with developers themselves to ensure maximum utility of the end product.

In summary, European as well as American sectors of language teaching and education as a whole have undergone significant but positive structural changes with the introduction and adoption of multimedia. However, as the society goes on to become more globalised, the pace of multimedia development is expected to increase which in turn requires adequate support and proactive actions from the legislators as well as the entire education sector.

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