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The utility of New Technologies in Education and Visual Arts

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1. Introduction

First of all, we would like to clarify that with the terms "New Technologies", "Multimedia Technologies" and "Information and Communication Technologies (ICT)" we mean all the educational and cultural products and services involved in the combined use of various media, which are accessible through television or computers [15]. Furthermore, we use the term "Visual Arts" in order to summarize the arts, that create figurative artworks, such as painting and sculpture, but also all the newest figurative arts (comics, video art, photography, e.t.c.) [20].

The appearance of personal computer in the beginning of decade of 80s and the outbreak of "the web" in 1990, as well as its effect on learning with the utilization of multimedia [1], resulted to the progressive incorporation of computers in all the levels of education in the countries of the western world [8] [21]. Although the reasons and the models of this incorporation vary, a common denominator was the belief that computer could significantly enhance teaching and learning [21] [22].

New technologies have long ago entered the field of Visual Arts, offering opportunities for the creation of new kinds of arts [7] and changing the way we can teach them. Nowadays, new kinds of arts are a cognitive object in various Schools of Fine Arts, both in Greece and abroad. On the other hand, not enough data are available, at least in Greek territory, for the contents and the effective use of New Technologies in education and teaching of Visual Arts and especially in the area of education and training of future and practicing teachers [14].

We believe that New Technologies, if used under appropriate conditions in education, contribute to active learning, offering plenty of educational electronic learning tools and environments and creating a friendly and attractive learning environment. Additionally, New Technologies help pupils and students to became familiar with technology and be trained in the skills of tomorrow's society, as well as they enrich the curriculums and promote the cross-curricular approach. The purpose of this paper is to analyze and present a) the contribution of New

Technologies in education, b) their support to the teaching of Visual Arts and c) to present the advantages from this cross-curricular approach for education.

2. The contribution of New Technologies in education

Since the 80s, when computers were introduced in education, the conviction that the utilization of New Technologies would likely lead to radical changes in education was cultivated. This conviction was proved to be a myth and a dream. However, it is true that ICT possess characteristics that are consistent with a more student-centered environment of learning and that they could have a significant impact on education. This could only happen in case the utilization of New Technologies is accompanied by important alterations in the practices of teachers and curriculums [15].

Although too much talk has been done for the possible methodological limitations of researches studying the impact of ICT on students' performance, most of the researchers agree that there are rich educational benefits to be acquired through the careful utilization and appropriate, for the developmental level of students, technology. According to Vosniadou [15], the characteristics of ICT, that encourage learning, are visualization, immediate feedback, the ability of the student to have greater control over learning, the ability for communication and cooperation, as well as the facilitating of access to information.

In specifically designed environments for learning, ICT may contribute in the development of active and collaborative learning and induce positive results in social development and cultural information of students [15]. Furthermore, they are a modern teaching tool for the teacher, which contributes to the enhancement of the educational process and the achievement of learning goals in almost all cognitive areas [16]. They, also, provide opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments and reflection about the content. In addition, they may serve as a tool to curriculum differentiation, providing opportunities for adapting the learning content and tasks to the needs and capabilities of each individual student and by providing tailored feedback [12]. In parallel, they differentiate the role of teacher in classroom, who from rapporteur becomes a cooperator, leader and co-investigator together with his students [19].

As far as education and training of future and practicing teachers is concerned, the use of New Technologies familiarizes them with technology and its usage and makes them potent and eager to take advantage of them in their classrooms.

However, we should note that positive results provided from the learning environments supported from modern technologies are not simply due to the

presence of ICT. The appropriate conditions should be met, so that positive results are produced by their utilization.

2.1. Conditions for the proper utilization of New Technologies in education

In order to produce educational benefits derived from the utilization of New Technologies, certain conditions should be met:

a) the teaching should be performed by qualified teachers, in order to obtain successful educational results,

b) the classrooms should be equipped with the appropriate infrastructure, such as the necessary technological equipment, suitable software and access to networks - under the condition that the created learning environment is suitable for the developmental level of the students - and

c) the teacher ought to clearly define learning aims, which should arising from a well designed curriculum, for successful results. Adaption to modern educational environments might become effective, when combined with an organized educational intervention [14].

The "society of learning" demands not only flexible individuals, capable of lifelong learning, but also flexible schools, governmental institutions and educational systems, adaptable to modern social demands. Otherwise, provided education will always fall short to the needs of our society [15].

2.2. New Technologies in Greek education

Nowadays, the schools in Europe are unequally equipped with multimedia computers. In our country, the equipment of schools continues to be lacking, while the provision for technical maintenance of the existing equipment is absent, having as result too many practical issues in the usage of the laboratories. The majority of schools have access to networks, but there are problems due to the high cost of telephone services and the lack of security, regarding material unsuitable for students [15]. On the other hand, Greek universities do not miss classrooms with complete and adequate equipment anymore.

We observe that nowadays more and more teachers of primary education are trained in subjects concerning New Technologies and choose to utilize them in their classrooms. For sure this number would be bigger, if the appropriate infrastructure existed in schools. On the other hand, we also encounter cases of teachers, who are inadequately trained, or reluctant to utilize ICT in their classroom, either because they are technophobic, or very traditional in the way they perform teaching, or even unwilling to adopt any change [13]. This has the result that they avoid to utilize or incorporate ICT in the current educational practices, reducing this way the potential positive effect of ICT and their capabilities to induce changes in school.

3. New Technologies in Visual Arts

With the current evolutions in technology cultural action and inheritance of modern societies can easily be promoted and projected [24]. Visual artists are capable to create artworks that in the past existed only in their imagination. These evolutions, also, allows greater precision in visual creation and permits artists to complete an artwork in a short time. Even new forms of art are created. It is known that Visual Arts utilize technology and, in a time when digital technology is dominant, the emergence of digital painting is a natural consequence.

Furthermore, apart from the content of Visual Arts, the way of their teaching is naturally renewed [24]. Suitable software is commercially available, such as "Abacus", which may assist the teaching of Visual Arts. The "Abacus" is an open platform and as every database it is "a powerful tool for organizing and managing various types of information" [22]. It was created in order to be utilized as an educative tool for teaching history of Visual Arts and more specifically the painting art.

3.1.   The support of New Technologies in the teaching of Visual Arts

Recently, many teachers encourage their students to create their own digital visual artworks. We observe likewise that the new forms of art consist a cognitive subject even at higher education [14]. Doubtless, digital art could not be absent from education, since one of its aims is to familiarize pupils and students with recent developments. New Technologies, of course, do not aim to replace the traditional means of creating visual artworks, but to utilize evolution as a tool that will allow school to create new environments for learning.

New technologies offer opportunities not only for new forms of art, but also assist students to project, promote and present their artworks digitally or not digitally. Students, in cooperation with teachers may organize virtual exhibitions in the internet, or with the help of presentation software.

Moreover, they open a window in global artistic heritage and help students to familiarize with the cultural and artistic tradition through specialized software, such as electronic encyclopedias, multimedia applications, virtual museums and varied socialization tools, like the social networks [24]. In addition, they may help students to access easily information and visual artworks and at the same time to perform editing.

Furthermore, a teacher can find commercially available educational software (open or closed type), or find them in the internet for free use, which will assist him in teaching Visual Arts. In the level of educational software concerning Visual Arts, many interesting examples are available, showing encouraging results and expressing positive expectations for the future [14]. Such an example is "Avacus", which is an open type software and as every platform it is "a powerful tool for organizing and managing of various types of information" [22]. It was created in

order to be utilized as an educative tool for teaching history of Visual Arts and more specifically the painting art.

Some of the advantages of educational software are flexibility, the capability for fast and clear feedback and the facility for teachers to induce external learning motivation. Furthermore, they provide the capability for individualized learning [25], they enhance cooperative learning, which usually is selected by most students and contributes to the social and emotional development of trainees [15].

New technologies activate senses [9] with visual and sound stimuli that set in parallel function both vision and hearing [11]. This way, they provide powerful educative tools for the cultivation of visual literacy and simultaneously motivate students' interest.

They, also, add variety to any educational curriculum [6] and contribute to the holistic learning procedure [17]. New Technologies, as expression tools, may find many applications in educational act and promote students' artistic creativity, while at the same time the opportunity given to students to get familiar with New Technologies helps them to understand the expansion of ICT's utilization in educational activities concerning other cognitive subjects of curriculum (cross-curricular) [23].

Of course, for all the above, expertise technical knowledge, high level of culture and vigilance in order to resolve any ethical dilemmas, that may arise, is demanded. A few of the matters with ethical implications are regarding copyright, information access control, content suitability, any ideological expediencies of various groups and propaganda [24].

4. The advantages of the cross-curricular approach of Visual Arts with New Technologies

Cross-curricular is defined the pedagogical approach that treat the knowledge as a whole and not as separate cognitive areas [18]. This approach is characterized as "progressive" or "student-centered" form of teaching, in comparison with the 'traditional" form of teaching, in which various cognitive subjects are taught separately. In other words, the first helps students to comprehend the world they are living in, while the other emphasizes on basic knowledge that should be learned by students [4].

The question is "What is it that makes cross-curricular work a successful approach for teaching and learning?". First of all, cross-curricular approach is closely connected with the constructivist view of learning, since students cooperate and learn through their own experiences [3]. ICT in combination with Visual Arts create a learning environment that, in comparison with traditional teaching, is adapted to experiences, interests and capabilities of students [2] [19]. In a few words, they enhance experiential learning, connecting learning procedure with the

daily habit of students using PCs. In parallel, they contribute to cross-curricular learning, enhancing this way the critical attitude of children towards art.

Cross-curricular approach assists students to comprehend easier what they are taught, since knowledge and capabilities acquired from a cognitive subject are utilized for the enhancement and support of learning in other cognitive subjects [3]. For example, in this case the knowledge and capabilities acquired by students with the utilization of New Technologies may be used for supporting the lesson of Visual Arts. Of course this requires that teachers possess good knowledge of many cognitive subjects.

With the use of New Technologies in the lesson of Visual Arts, students get familiar in an effortlessly and attractive way with the utilization of New Technologies, broadening at the same time their visual mode of expression [23]. The teaching of Visual Arts becomes more interesting and gains acceptance in the whole school community.

Kerry [5] supports the opinion that cross-curricular approach contributes in the development of capabilities, such as resolving problems and justification. This happens because students do not only utilize knowledge and capabilities acquired from one cognitive area to another, but also synthesize information and ideas of these areas. In addition, they may use the knowledge from different disciplines in order to resolve problems. Thus, students are given the opportunity to develop capabilities useful even in daily life.

The cross-curricular approach, as a way of selection and organization of school knowledge, allows students to discover the connections between different school lessons, to make comparisons, compositions and generalizations, and encourage students to build knowledge in order to "to learn how to learn" [19].

Another advantage of cross-curricular approach is that it enhances activity and involvement of students, since learning is placed in a framework both interesting and experiential for the student [10]. Perhaps a reason, that cross-curricular approach encourages active learning, is the range of information available for study from students [4]. For example, some students are interested in visual arts, while others are interested in other cognitive subject, such as New Technologies.

5. Conclusion

It is known that technology has revolutionized the way we work and is now set to transform education [13]. The role of New Technologies is to support education, not to replace it [8]. The use of ICT is constructive in all levels of education, but also in teaching of Visual Arts. Visual and pedagogical value of (open type) educational software for visual arts, such as software "Abacus", and the capability of adaption of these types of software in different educational environments from the one they are initially designed to operate in, is indubitable. Learning becomes more pleasant and interesting and curriculums are enriched with

the promotion of new teaching methods, such as cross-curricular approach. However, this may happen only in case their utilization happens under the appropriate conditions.

In order to produce educational benefits with the utilization of New Technologies, it is necessary that Greek schools and universities are equipped with PCs for all their classrooms and appropriate educational software and protection software from inappropriate online material. Furthermore, schools must have access to networks and the ability to maintain their infrastructure. Finally, the expertise of teachers in issues regarding New Technologies is considered necessary. In this way educational benefits of ICT will become obvious and students will get familiar with New Technologies and their utility and will be able to actively participate in the society of the future.

6. References
English references

[1] S. M. Alessi & S. R. Trollip, "Multimedia for learning: Methods and Development", Massachusetts: Pearson, 2001.

[2] B. Bruce, "Technology and arts education", In: L. Bresler, (Ed.), *International Handbook of Research in Arts Education,* pp.1355-1359, Dordrecht: Springer, 2007.

[3] D. Hayes, "The seductive charms of a cross-curricular approach", *International Journal of Primary, Elementary and Early Years Education*, vol. 38, no. 4, pp. 381–387, 2010.

[4] L. Kelly, "Why use a cross-curricular approach to teaching and learning?", In: L. Kelly & D. Stead (Ed.), "Enhancing Primary Science: Developing Effective Cross-curricular Links", pp. 1-12, Berkshire: Open University Press, 2013.

[5] T. Kerry, "Cross-Curricular Teaching in the Primary School: Planning and Facilitating Imaginative Lessons", London: Routledge, 2011.

[6] A. Kontogianni & X. Arapaki, "Suppositions … Propositions … about TRANSITIONS. Using New Technologies in the Fields of Visual Arts Education and Drama in Education.", *ESREA "Life history and Biography Network: Conference",* Volos, 2-5 March 2006.

[7] P. Lunenfeld, "The Digital Dialectic: New Essays on New Media", Cambridge (Massachusetts): The MIT Press, 2000.

[8] H. Perraton & C. Creed, "Applying new technologies and cost-effective delivery systems in basic education", *International Research Foundation for Open Learning,* February 2000, Available on: http://www.unesco.org/education/wef/en-docs/findings/technofinal.pdf

[9] A. Puurula, "Searching for a pedagogical basis for teaching cultural heritage using virtual environments", In: S. Karppinen (Ed.), "Neothemi: Cultural Heritage and ICT at a Glance"*,* pp. 17-32, Helsinki: University of Helsinki-Department of Teacher Education-Vantaa Institute for Continuing Education, 2002.

[10] J. Savage, "Cross-curricular Teaching and Learning in the Secondary School", London: Routledge, 2011.

[11] N. Selivanov, "Education, Art and ICTs: Integration for the Development of One's Personality", In: L. Gordon (Ed.), "Education, Art and ICTs: Integration for the Development of One's Personality", pp 21-41, Moscow, 2004, Available on: http://iite.unesco.org/pics/publications/en/files/3214631.pdf

[12] E. Smeets, "Does ICT contribute to powerful learning environments in primary education?", *Computers & Education*, vol.. 44, no. 3, pp. 343 - 355, 2005.

[13] D. M. Watson, "Pedagogy before Technology: Re-thinking the Relationship between ICT and Teaching", *Education and Information Technologies,* vol. 6, no. 4, p.p. 251-266, 2001.

Greek references

[14] X. Arapaki, "The use of new technologies in the teaching of visual arts for the education of students at departments of education", *4th National Conference on "Utilization of Information Communication and Technologies in Teaching Practice",* vol. 1, pp. 166-173, Syros, 4-6 May 2007.

[15] S. Vosniadou, "Children, Schools and computers. Prospects, problems and suggestions for the more effective use of new technologies in education.", Athens: Gutenberg, 2006.

[16] A. Vrocharidou & S. Sotiraki, "The approach of art with the help of Interactive whiteboard in kindergarten", *7th National Conference with International Participation "ICT in Education"*, vol. 2, pp. 529-536, Korinthos, 23-26 September 2010.

[17] S. Grosdos, G. Makaratzis & C. Andreadou, "Art and creativity in school: The use of ICT in the teaching of Art", *2nd National Educational Conference on "Digital and Web Applications in Education",* pp. 508-519, Veria-Naoussa, 23-25 April 2010.

[18] C. Dafermou, P. Koulouri & E. Basagianni, "Kindergarten Guide: Educational Planning, Creative learning environments", Athens: OEΔΒ, 2008.

[19] M. Diamantopoulou, "Cross-curricular approach of the Art with the utilization of textbooks of primary school. A creative intervention through the example of the Art Occupations (Lesson of Visual Arts, 5th and 6th class) and with the support of ICT (Interactive Educational Software)", *5th conference on "I learn how to learn",* 7-9 May 2010.

[20] Encyclopedia Domi, vol. 8, pp. 496.

[21] M. Theodorakakou & I. Karasavvidis, "The collaborative design of a digital poster of infants: Aspects of Mediation and Interaction", *4th Conference on "ICT in education"*, Syros, May 2007.

[22] V. Komis, "Introduction to educational applications of Information and Communication Technologies", Athens: New Technologies, 2004.

[23] P. G. Markatatos, "Digital art as a mean of familiarizing students in using P/C", *3rd National Conference with International Participation: Information and Communication technologies in education*, vol. 2, pp. 339 – 344, Rhodes, Kastanioti (ed.), 2002.

[24] I. Paliokas & V. Damianidou, "The software interfaces as an extension of the visual space and the Technological Background of Art Education", *1st*

Educational Conference on "Integration and Use of ICT in the Educational Process", Volos, 24-26 April 2009.

[25] V. Pavlou & N. Valanidis, "Digital Internet Activities with Cross-curricular and Interdisciplinary Approaches for Kindergarten: The Role of Visual Arts", In: C. Aggeli & N. Valanidis (Eds.), *6th Congress of Greek Scientific Association of Information and Communication Technologies in Education*, Lemesos, pp. 288-298, 26-28 September 2008.

Abstract

We live in a world of representations, where the digital broadcast of picture has literally enveloped the planet. More specifically, with the spreading of multimedia and the revolution brought with the internet, picture has become even more important. Through visual arts it is largely supported that the occupation of young people with New Technologies, in modern digital era, is not only useful as entertainment, but also offers access to the modern cultural capital and to labor market. With the use of New Technologies in education, pupils and students are taught the skills of future and therefore they will become effective in tomorrow's society [13].

With the present work we intent to analyze a) the contribution of New Technologies in education, b) their support to the teaching of Visual Arts and c) to present the advantages from this cross-curricular approach for education.