The Importance of Visual Education in E-learning

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Abstract

In the rapidly changing learning landscape of modern globalization emerging distance learning technologies constitute valuable innovative educational methods that create new possibilities for learning and knowledge. A key feature of the material is the visual representation of information both in print and digital form. The resolution of an image is constructed by (re-) composing the multiple parameters affecting communication. The image is the message in the process. Our motivation for investigating the dynamics of visual culture in relation to the educational material used within e-learning springs from: (a) the specific nature of the information that represents the educational material that is organized and applied in the context of distance learning, and (b) the absence of visual culture in almost all levels of education, which is full of visual representations both in print and digital forms. The structure of the paper develops around two thematic pillars: (a) presenting criteria that examine the appropriateness of visual material of MOOC courses, (b) examination (through bibliographical review) of key visual elements and techniques necessary for the acquisition of skills and the development of visual intelligence through the subject of “History of Art”. In all cases of visual stimuli and all levels of visual intelligence, meaning exists not only in individual representational data and symbolic and verbal material but also in the composing forces coexisting with the actual visual description.

Keywords: e-learning, visual education, visual culture, visual communication.

1. Introduction

Since antiquity, there has been much negotiation on the issue of the correlation between vision and critical perception. Heraclitus (2001) argues that “barbarian souls” cannot correctly interpret the senses: “Eyes and ears are bad witnesses for man if he has a soul that does not understand their language”. The controversy between reason and perception of the senses seems so in Democritus (Taylor, 1999) who separated the “dark” knowledge acquired via the senses from the “bright” genuine knowledge in its logical form, as well as from Plato (1969) who, through the cave parable in The Republic, emphasizes the misconception of reality through direct vision. Aristotle (1987) is the first who revalues in his De Anima the significance of sense perception and experience for the acquisition of knowledge (“without images, the psyche cannot think”) implying that any empirical zetesis, and in our days any empirical research, starts inescapably from experience (Arnheim, 2004).
In modern times, under the giant leap of new technologies, people are quickly adapting to the demands for new products, especially those that reproduce the information visually. Human beings, from a very young age, come into contact with the magical image of the TV, the computer screen and the various ultramodern portable games as well as the smart mobile phones. Contact is an integral part of the everyday life of modern children living in the so called western developed countries to such an extent that they are referred to as the “digital screen” generation. They spend many hours in front of various “screens”, which influences their forming ideas and opinions about many important issues. As a consequence, there is also a significant decrease in their ability to understand things with their senses. Their visual critical perception has been degraded resulting in the lack of understanding of the meaning of the image. Electronic media construct and display a world of symbols and images that exist only on the screen. They emulate simulacra (idols – simulation materials) that have nothing to do with an antecedent reality. Television reproduces and expands the semiotic logic of an advertising campaign by disconnecting the sign from what is important, opening up a new space in cultural production (Poster, 2002).

- Visual education implies perception and critical analysis of visual information.
- The imaginary level of visual intelligence is mainly characterized by the experience of the receiver of the visual message that extends beyond its perceptual ability.
- The MOOCs platforms today represent the most advanced method in distance learning.

Man loses the ability to express himself through the image and takes recourse to more intimate means, for example to reason (Arnheim, 1974). However, the combination of speech and visual perception is not competitive in a balanced person. There are experiences and phenomena that must first be coded with the aid of aesthetic perception and, then, acquire a verbal name. At the same time, art offers not only beauty and delight, but it can also offer knowledge. Knowledge of a multilevel kind goes beyond the narrow context of simple information, and illuminates the cultural level of every historical age. At the same time, art as knowledge also contributes to human cultivation by means of our observation and reflection of and communication with the artwork. By say this, one undeniably confers some special qualities upon the work of art. It is perhaps these qualities that Heidegger had in mind when he suggested in his (Der Ursprung des Kunstwerkes, 1950) that art is a kind of knowledge not in the sense of the observation upon previously unknown fact but in its original, authentic and, beyond any given, meaning (Heidegger, 1950). Of course, there is the opposite view represented, for example, by Picasso for whom art conveys no such original meaning (Gombrich, 1995). The painter was in fact annoyed by all those who were trying to understand his art through his paintings, saying: “Everyone wants to understand art. Why don’t they try to understand the song of a bird?”

In the modern school the image culture conflicts with curriculum practices, applying a postmodern model of organizing the learning process. The infinite volume of information changes the data in terms of the content of the concept of knowledge. Students possessing a huge digital library and the possibility of multiple and varied comparisons with simple images often question the concept of knowledge and the role of teachers in the classroom. At the same time, knowledge acquires the characteristics of a consumer asset, e.g. school textbooks are ever changing, adopting fashionable forms and trends and following dominant values. Changes also appear in the structure of the school with its transformation into a modern operational educational organization (Pleios, 2005).

2. Visual literacy

Visual education today is more than mere sighting. It implies perception and critical analysis of visual information. Increased visual intelligence of an electronically-educated person means easier understanding and critical understanding of the importance of the information that
Visual intelligence enhances the action of human intelligence, essentially by expanding the creative spirit. According to Arnheim (2004), visual perception is not a passive visual recording of the stimuli but an energetic mental process that decodes the context of the selective functions of vision. This conception is prevalent in the German philosophical tradition which understands education (Bildung) intents of a constant dialogical interplay between the human mind and the external (natural and social) world; in and thru this process not only the human mind acquires know ledges of the world but also it forms and transforms itself. In other words, the human mind builds and educates itself (sich bildet) through such acts of epistemic construction. In the case of art, it also assumes such by paideutic and self-formative role. Art, as one of the major forms of self-expression available to the human mind, takes up the mission to educate humanity and protect it from the perils of modern mass culture. In the writings of the Frankfurt School thinkers (for example, Marcuse and Adorno) one finds the highest pick of the criticism exercised against the homogeneity and instrumentalism of modern culture.

The ever-increasing dynamics of the importance of the image in modern everyday life intensifies the need for educating human beings in the way they receive and understand the visual stimuli. Visual literacy, according to Raptis and Raptis (2002), relates to educating individuals about how they critically reflect on the visual impulses of the natural and cultural environment they are members of. Visual education, according to Jeffers (2002), reinforces the crisis, resistance and global view of the projected image.

However, the combination of the word “education” with the word “optics”, with great importance, requires the study to be supported. The creation and understanding of visual messages is in part natural but their effectiveness depends, mainly, on study and practice. Visual education is characterized by visual syntax. There are elements and methods that can be used to create visual messages. Knowing these techniques can lead to better decryption of visual messages.

Visual data consists of three distinct levels:

- The introduction of visual information, consisting of infinite symbol systems;
- Visual representational material from the environment that is captured, mainly by the visual arts;
- The abstract infrastructure, which denotes the form of any physical or technical thing.

There is an extensive world of symbols, from the most abstract to the most representative, which identify organizations, actions, directions and moods, inviting man to learn them almost in the same way he learns language. Language itself is at its birth consisted of images and is then evolved through the use of symbols. Symbols are particularly important for visual education.

The imaginary level of visual intelligence is mainly characterized by the experience of the receiver of the visual message that extends beyond its perceptual ability. Understanding things, retrieving information, decoding and evaluating events or systems are highly and immediately effective through visual observation. The observation process works not only as the technical learning of a skill but is, in essence, a vital function of man’s everyday life. The abstract infrastructure, the elementary outline, is essentially the pure visual message. However, syntax, in general, in visual education simply means a methodical and detailed arrangement of the parts of a synthetic image, depending on the mechanism of perception of the human organism that defines the importance of the visual message.

Optical literacy suggests something more important than just recognizing shapes and creating visual messages creates perceptual skills. In order to practice these skills, it must go beyond the innate visual possibilities that the human body has, beyond its instinctive reactions from visual irritations, beyond its own “taste”. The development and knowledge process must
include the full range of visual elements of a representation from the most simple visual information units to the most complex ones. According to Gestalt theory, a major role for the emergence of final results in sketch, photography, or interior decoration comes from the control of elements related to the visual arts. Deep human enthusiasm and art enable someone to observe techniques and perceive the image with critical perception and reflection as opposed to the massive message that the general public perceives.

According to Arnheim (1974), man needs to cultivate virtually the virtues of his vision, contributing to his revitalization and guidance. Based on the above, visual education requires great familiarity with visual knowledge and skills such as:

- Knowledge of the visual vocabulary including elements such as balance, intensity, smoothness and sharpening, preference for the lower left, attraction and grouping, positive and negative;
- Knowledge of the basic elements of visual communication, i.e. the delineation of the point, line, shape, color, tone, texture, scale, dimensions, movement;
- Knowledge of visual conventions and the anatomy of the visual message, i.e. the visual symbols and their socially agreed meaning, the representation, the abstraction;
- Knowledge of the dynamic contrast in the image, namely contrast and harmony, the role of contrast in the visual perception, the role of contrast in composition, tone and color;
- Visual thinking, i.e. the ability to convert any type of information into an image, graph, or any visual form that encourages communication with that information;
- Mental visualization, that is, the process in which a visual mental image is formed, essentially the brain activity that takes place in a mental representation;
- Visual reasoning, which refers to the logical thinking that takes place primarily through the consistency of mental images;
- Critical view, namely the application of critical thinking skills to the visual materials;
- Visual distinction, the ability to perceive the differences between two or more visual stimuli;
- Visual reconstruction, the ability to reconstruct a partially occluded visual message in its original form;
- Visual and verbal connection, the ability to connect optical cognitive images to each other in a unified theme, as well as verbal messages with visual representations to enhance meaning;
- Reconstruction of meaning, the ability of verbal or visual reconstruction of meaning, a visual message based on incomplete information or data deficiencies through visualization;
- Construction of meaning, the ability of rendering meaning to a visual message based on any visual or verbal information. In essence, it is the “integration” of the whole process of recruitment, management and processing of the visual stimulus.

3. Reclaiming visual education

In the field of education, visual literacy essentially involves the possibility not only of using and critically evaluating visual information, but also of creating visual concepts and producing new visual messages (Kress & Van Leeuwen, 2001). So the student is called upon to play three roles through his/her training:

- The role of the viewer, i.e. the observer of the images;
- The role of the judge through which the visual messages will be reproduced;
- The role of the producer of images to others as a means of promoting his/her personal messages.
The teacher can offer his/her students many opportunities to get in touch with the image in theaters, museums, cinemas, etc. Even in his/her own classroom within the learning process, he/she uses ICT to digitally visualize the elements of his/her teaching. Students' contact with art and more generally with the structure of an image, should not be limited to acquiring knowledge of terminology or technical description skills. If the purpose of the teacher is this then he/she only succeeds in acquainting his students a product by stripping the creation from its deepest message. The child will see an object with properties such as type height and width without realizing that this may be a work of art. The relationship with the image that is of interest to him/her is of particular importance. It is a phenomenon that also requires investigation at the level of psychology, because this relationship, free from any acoustic verbal stimuli, is characterized by primary feelings (Sorlin, 1977). Throughout this process, ideas in the form of inundation must not be checked for their correctness. At this moment, students create a piece of themselves. The student's communication with the image must remain unimpeded, almost personal. Image often travels youngsters, brings them into emotional acrobatics, matching roles or distancing. Students no longer accept the passages of a picture at this point, messages that are often the result of teaching. At this point, they are the judges themselves, they are the ones who reflect and they do so through an ideal dialogue with the creators of visual information. Thus, they gradually acquire the skills of decoding the implied concepts by incorporating practices of approaching the image from many angles.

Incitement to group discussion, commentary, exchange of views and conflict of ideas are aimed at the conscious pupil, who is now able to choose and not succumb to the exaggeration that leads to mass culture. The student's critical engagement with the pictures gives him the opportunity not to drift into emotional mimetism and identities. However, once children have become familiar with the methods and techniques for image production and come into contact with distinguished authors, they must, then, also become “creators” of visual messages (Theodoridis, 2002).

The pupil's participation in the production of visual work enables him to creatively use the theoretical concepts and decode them through creative engagement. The participation, for example, in the production of a small digital film, a commercial spot or even the construction of a website will bring him, other than technical skills, experiences that will have a direct impact on his critique and perceptual ability. Through the process of creating and using collaborative learning with the project method, the student will explore, discuss and ultimately judge the aesthetic outcome based on visual education rules.

Today, the computer science courses in schools is “scrambling” with a large number of multimedia programs that cover almost all of the curriculum classes at all levels of education. However, few of them are mainly used due to lack of information, and training of teachers, as well as lack of infrastructure. The majority of programs used in the learning process are not based on issues related to the structure of visual education. Few of them use pedagogical visual information to demonstrate visual culture deficiencies on the part of their creators. In educational applications the visual representation of information must be pedagogical, serve teaching purposes according to the curriculum and, above all, be compatible with and understandable in relation to the ages of the pupils to whom it is addressed.

The image indicates visually to the student the evidence of the importance of their direct experience in relation to his/her own response to it. When a student sees, for example, visually a historical event as a static or moving image, he/she will not find the organization of the visual elements of the image sufficient. The creator of the image should try to associate this direct image with another synonym (previous) to create a comprehensive view of the historical event. In distance learning, this function is all the more important as even physical experiments come into contact with students through the sequence of images. Walker and Chaplin (1997) argue that new
technology not only offers multiple functions that produce the image culture, but also influences the ways in which culture is analyzed and studied today.

In addition, according to Friedman (2018), young children who study with digital photos improve their ability to perceive the details and broaden their linguistic parameters, including vocabulary, the use of complex sentences, ask questions and tell stories about images. Research suggests that acquiring literacy skills encourages decision-making when selecting content and designing pictures. It also encourages verbal thinking about the images that have been taken. The study demonstrates the need to implement an integrated approach to education and to make the necessary changes from early childhood.

In distance learning, multimedia applications, as well as asynchronous or modern communication platforms, are characterized by their interactive environment. According to Manovich (2001), unlike in the past, where the flow of presentation is given, the user can now interact by interfering with the flow of information. In this process of interaction, the user can choose which elements to show or which paths to follow in order to create a unique project, to feel as both the co-creator and the active shareholder of the whole process. However, in order to do so and to have a real effect, he must possess skills related to visual education.

One of the purposes of visual education is the emergence of visual thinking. Visual thinking approaches and connects complex ideas or ideas with visual elements such as images, word maps or infographics. Visual thinking can be used by e-learning professionals to create content, as well as by online learners, to visually represent their ideas and thoughts during the e-learning process. Visual thinking allows students to organize their thoughts and ideas without having to store every piece of knowledge in their minds. They can create and use a visual map of representation of the information they acquire as a reference and study and design study. When information is presented in visual form, students are more likely to absorb and link them to their real world. This is mainly due to the fact that their brains connect the new concepts with the previous knowledge. They can also better understand the relationship between relevant concepts, as well as any sub-theme related to the idea (Pappas, 2015).

According to Stewart (2013) it is required that digital media literacies enable a learner to engage, be confident and learn in a MOOC. These literacies include print and visual literacy, information literacy, critical thinking, the ability to use hypertext and mastery of complex etiquette. On the other hand, MOOCs, as one of the current e-learning and distance learning environments, have to be designed and developed according to the specifications and qualities of visual education.

4. MOOC

The use of web-video during the learning process has increased in recent years. The number of educational institutions, businesses and organizations providing their content using web-videos is increasing rapidly. Search engines and platforms are now more specialized in learning by organizing their material in distinct learning-oriented classes (youtube.com/edu, mylearningtube.com). Most of the universities offer lectures in addition to the internet in modern forms of communication relating to mobile devices (iTunes). At the top of this industry are the Massive Open Online Courses (MOOCs), taking an increasingly important part of education (Chorianopoulos & Giannakos, 2013). The provision of a huge amount of training through MOOCs and the competition of educational institutions in relation to the thematic units, to which their services refer, shapes the need to adapt and adopt not only models or techniques of mass evaluation of learners but also the functions of the MOOCs. The functions are related to the form and appearance of the interface, the content of the training programs in relation to their quality and their interaction with the participants.
The study of platforms and research on the web for the multitude of programs provided by academic institutions and educational institutions has shown that MOOCs are currently at the cutting edge of technological developments in distance learning and the design and production of the teaching material needed to successfully such a project. The involvement of large and renowned universities and investors around the globe and the huge demand for their programs confirmed by Karsenti (2013) shows that there is “overpopulation” from across the globe which is “thirsty” for learning. Meeting the educational needs of a constantly growing population changes the data not only in distance education but also in the design of education policies at international level in terms of higher education and lifelong learning. The intercultural character of the programs and the diversity of the thematic units without any prerequisites promote equality and democratization in education, as Barber (2013) confirms, which supports the need to create barrier-free learning communities with people of different socio-cultural and economic backgrounds.

The interface that defines the user's visual approach to software has been seen to play an important role in achieving efficiency, and learner satisfaction in MOOC environments. The user’s interface evaluation criteria are (edX, 2018):

- Video viewer control features where appropriate, for example, repeat, full screen, slowdown, stop and pause;
- Cognitive search engine;
- Categorization of videos and lectures for easier searching;
- Ability to download video files on the learners’ personal devices;
- Help to reduce platform mistakes;
- Provision of differentiated video encoding with the direct goal of their adaptation them to the learner’s connection speed;
- Set the frame so that the objects/graphics match the screen ratio;
- Provision of a standard video format as “HTML5 compatible with video”;
- Provision of videos related to the subject;
- Ability to see the trainer on a small screen frame. The student sees the training material as the trainer explains;
- Ability to switch between slides and tutors in full screen;
- Minimum video resolution (320 x 240 pixels);
- Ability to display video files with a thumbnail and (possibly truncated) title. Information about the date of view and their tracking number must be provided.

Evaluating the content of a video file is inferred from the attention the learners display while viewing it. It is important to ensure that video content is accessible, appropriate and accurate in relation to the subject of the program. Criteria include the content of the video file, good audio and video quality, and the duration set to not exceed 10 minutes. The criteria for evaluating technical specifications and video content formats are (edX, 2018):

- Clear sound (even experienced presenters are prone to logic when recorded);
- Level of detail of the information provided on the subject appropriate to the level of the audience for which the resource is designed;
- Provision of reports of the facts and information in the video;
- Provision a video of summary of lecture;
- Video length (not more than 10 minutes);
- Provision of a copy of the video lecture;
- Synchronization of video and lecture notes;
- Video size (up to 10 MB for easy transfer);
- Synchronization of video lecture and its transcription;
- Use of a color to highlight important information;
- Use of small suggestions, ease of understanding;
- Elements of surprise to attract trainees;
• Avoidance of videos with fast cuts or landscape changes;
• Text body occupying 25% to 40% of the total space of a video screen.

The form of cognitive information and the way in which distance learning is offered, the possibilities of interaction between the user and the cognitive material, the evaluation and self-assessment capabilities, the communication and recording capabilities, the environmental friendliness of the platform are the key success factors of such a platform operation.

5. Conclusions

In conclusion, education should bridge the gap between the complexity of the initial observation and the simplicity of the essential image. Education can use techniques to simplify images in order to increase the perceptual ability of students. The image approach must be abstractive so that knowledge is understandable and easily accessible. However, abstraction takes place in logical contexts and is always maintained in correlation with empirical reality. Visual thinking requires that one has the ability to promote visual patterns as images of the forces (mind, body, machine, idea, society, etc.) in which they are directly related to our existence or life itself. In this spirit, MacLuhan (1964) has claimed “the media is nothing more than an extension of ourselves”.

According to the above, the MOOCs platforms represent the most advanced method in distance learning. They host and offer educational programs that have been enriched with all the capabilities and tools ensuring, as much as possible, the successful design of highly specialized programs. Designers and managers of academic and educational institutions are invited to exploit this wealth of tools and design and implement programs that are both pedagogically and technologically oriented and friendly, focusing on the uninterrupted and successful flow of educational materials. They should also be distinguished for embracing, freedom consistency, versatility, efficiency and aesthetic and minimalist design. Last but not least, our analysis has also shown that MOOCs platforms should abide by the rules of Nielsen (1995) regarding their usability.

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