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Visual Communication and the promotion of Health: an exploration of how they intersect in Italian education

Viviana De Angelis <viviana_dot_deangelis_at_uniba_dot_it>, Università degli Studi di Bari Aldo Moro Patricia Mannix McNamara <Patricia_dot_M_dot_McNamara_at_ul_dot_ie>, University of Limerick Rosa Gallelli < rosa_dot_gallelli_at_uniba_dot_it>, Università degli Studi di Bari Aldo Moro Gemma Pichierri <gemma_dot_pichierri_at_gmail_dot_com>, Media Training Expert

Abstract

The use of new technologies, media and computational methods in Humanities may evolve and indeed it is already changing the "contents" and "forms" of contemporary education, opening new scenarios previously unimaginable. Nowadays Visual Mobile Devices, smartphones, tablets, etc. contribute to a range of computer-mediated activities, which are related to specific locations and times. But for such critical reflection, we need a closer look to deeper layers of our culture to unveil the characteristics of new technologies and devices. This paper describes some emerging aspects of the teaching use of visual communication techniques in primary and secondary schooling. In particular it reviews the evidence of the efficiency of visual communication for learning both in varied curriculum disciplines and of transversal socio-ethical affective skills necessary for the promotion of health and the construction of a planetary citizenship. The paper illuminates the didactic applicability and unique potential of images for the epistemological peculiarities of different disciplines, highlighting how educational use of images in creative pedagogy can be more focused given the function they perform in the more general cognitive process of individuals. The theoretical analysis of the teaching validity of the use of visual communication, as reported in the international literature, seems to receive confirmation from a case study, which provides detailed analyses of how this technique can enhance specific projects and demonstrates its significance for wider practitioners.

1. Images and Learning

In the last decade societies have witnessed the sudden and widespread introduction of new technologies, all of which involve sophisticated and complex processes of communication. This phenomenon has been described as a digital revolution that, on a daily basis, transforms contemporary life. However, the increasing spread of technologies for managing information and communication in effect runs parallel to the changing learning needs and learning modes of individuals. This in effect has resulted in the need to plan and organize new, more flexible and responsive pedagogical approaches [Gallelli and Annacontini 2011, 13]. We live in a society increasingly dominated by communication via images. In recent years, new information technologies have significantly expanded the possibilities for representing information. The Internet facilitates speedier access to and downloading of images, as well as their manipulation and reuse. It makes great use of visual and multimedia formats in all areas, particularly that of education. Ease of production and consumption, however, does not always lead to educationally conscious and/or indeed moral or ethical use of images. Innovations produced in the Internet era, and the impact of the World Wide Web on science, commerce and entertainment, are certainly evident for all to see. Less understood are the long-term effects of the digital era on humanity and indeed how it inexorably changes human life. It will take many years, in fact, to fully understand how these changes affect the human cognition [Veen and Vrakking 2006] or indeed to understand the changes occurring in the relations between individuals [Burgess and Green 2009]. Despite these problems, in the last two decades, studies that investigate the relationship between image use and learning have increased and this led to the development of an initial survey of the "state of the art" that can help practitioners to be more aware of the function that image consumption performs in the more general cognitive process of individuals. The desire to help practitioners to be more aware of the

real potential that visual communication offers as learning support drove this project. When an image is used to promote learning, it is necessary to consider whether and how it will become functional in the general cognitive process of students. It is also important to consider whether it is even possible to assess its impact and usefulness. In-depth analysis of the existing literature on the evidence of effectiveness of visual communication on human learning is an important first step in developing understanding of the degree of functionality of image usage and should also serve to inform guiding principles for the education of practitioners, so as to prompt more effective and educationally aware choices.

There are clearly myriad variety in image types, and Calvani advocates that a first distinction can be made between static and dynamic images and the degree of realism they contain. Calvani differentiated between realism, realism adapted and symbolization [Calvani 2011]. Initially it may appear easy to distinguish static and dynamic figures if one refers to the surface characteristics of the image itself, i.e. how it is done. However, if one transfers the discourse to a more cognitive (even philosophical) plane, one might argue that there is dynamism even in stillness. In fact, in many physically static diagrams there can exist a dynamic plane, because cognitively they may indicate the occurrence of an action, and the representation of a graphical model encourages the onlooker to think laterally toward some changes [Calvani 2011] [Paoletti 2011]. For example figure 1 represents a physically static diagram: the water cycle. However, note what the arrows represent; they encourage the onlooker to think of the changes taking place and therefore imply an intellectual dynamism.

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Figure 1. Example of dynamic image: the water cycle. Source: http://educazionetecnica.dantect.it/tag/idrico/

Bearing in mind that the idea of reproduction of an objective reality is rather naïve, one can still explore the concept of "realism" when referring to representations that maintain a direct and explicit connection with the object represented. This realism category includes artifacts such as photographs, imitative drawings, maps, video sequences in real time, which have not been manipulated in any form. Educationally relevant cognitive operations that are associated with the use of these types of images are those such as object recognition, comparison, classification, spatial orientation, discovery of the types of views experienced and measurement. Calvani's second category is defined as "adapted realism". In adapted realism, an alteration is intentionally sought for specific purposes; it maintains a discreet

relationship with the original image (concrete referent) and is still recognizable, but there are specific amendments in order to further understanding. This category usually has an educational motivation. In this case selected operations are performed on the image such as highlighting or schematization. This type of endeavour includes the majority of the diagrams in scientific texts that simplify the complexity of an object being represented, or which highlight particular aspects of it. Dynamic representations can include endeavours such as demonstration videos, which have been subjected to mounting, with specific space-time manipulation, in order to highlight and communicate the relationship between elements or between the parts and the whole. The educational functions prompted by these resources are related to the focus of attention on internal aspects and recognition of relationships and internal connections.

Figure 2. Photo (a) and drawing (b) of the cardiac system (Source: http://it.wikipedia.org/wiki/File:Cuore.jpg)

In the images shown here (Fig. 2), one can discern a photo and a drawing of the cardiac system. Both represent the same concrete referent, but in design one notes changes or differences to some features of the system, simplifying them and enlarging them. This is done because non-experts, for example, would possibly have difficulty interpreting photos alone. Therefore, to prompt better understanding of the structure and operation of the system that is being viewed the drawing or symbolisation is used. This is the third dimension that Calvani articulated, that of symbolization in the strictest sense. According to the existing literature, symbolism concerns the representation of complex phenomena. The representation adheres to the rules of an entirely conventional code, through the use of lines, arrows, blocks, organized patterns, or data and numbers arranged in specific orders. In this context they include most of the diagrams with which one is familiar, (conceptual maps, flowcharts, etc.). The cognitive functions that connect to this type of images include: symbolizing, correlating, interpreting, hypothesizing, deducing, constructing and testing models and systems [Calvani 2011]. A pie chart, for example, provides immediate quantitative and qualitative information on a phenomenon (Fig. 3) that one subsequently interprets and applies to one's prior understanding.

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Figure 3. Example of a pie chart. Source: http://www.rischiocalcolato.it/wp-content/uploads/2015/06/globalenergypie-650x573.png

2. Dual Coding Theory

Further study is required on the potential of the use of visual communication and on the potential that images have to affect cognitive processes. The relationship between images, words and thoughts were examined by Canadian psychologist Allan Paivio in his seminal work on Dual Coding Theory that has significantly influenced theories of multimedia learning [Paivio 1991]. Dual Coding Theory argues that there are two different encoding systems for processing and presentation of information: a verbal system that takes care of verbal information and linguistics and a nonverbal system that processes visual information and mental images. When a stimulus, such as a word, is presented audibly, it is encoded by the verbal system that uses the auditory subsystem. Because the word is identified, it is compared with a basic representation unit, called logogen, that is the representation of the word contained in long-term memory. The same type of structure also characterizes the nonverbal system, therefore image is encoded in the visual subsystem and is compared with the *imagens* units of representation of the images. The logogens and the *imagens* are related to each other. For example, one can apprehend the mental image of a tree and then describe it with the word tree, or hear the word tree and then form a corresponding mental image. Various studies have shown the effect of superiority of images or figures in remembrance [Calvani 2011] [Paivio 1991]. When asked to recall a list of figures and words, memory is better served by figures. With words, also, those referring to a concrete object are remembered better than abstract ones. This happens, according to Paivio, because the figures are processed by both systems. This awareness may render more efficient designing of formative and learning essentials for students in different age groups.

3. The Multimedia Representation Theory

Theoretical relationships between images and learning have been enhanced by the work of German researcher Wolfgang Schnotz who proposed a model of multimedia learning, noting the role of external representations, i.e. text and figure, and internal, mental models in building a multimedia knowledge #schnotz2001. External representations can

be divided into verbal and descriptive or pictorial representations or visual representations. External ones can be descriptive or pictorial^[1] solely or exclusively. Internal representations can be both descriptive and pictorial. Mental models^[2] are in fact verbal representations, because they are descriptions of inner language, but they are also pictorial representations, as a mental model maintains the structural characteristics of the object represented, that is, the object based on a structural or functional analogy. Learning more effectively takes place in an integrated model of such representations. Paoletti also has dealt with this issue explaining that both text and shape can give life to a mental model, but realize it by different routes. The first goes through the reading and understanding of the text and this is the most challenging, because there are several levels to be navigated, firstly the representation of the surface structure of the text, then the representation of the ideas expressed in the text and finally the formation of the mental model. A figure is more immediate and direct; in fact the visual perception passes directly to the mental model. In this case the figure, being an external analog representation, isomorphic to the situation described by the text, can drive the process of elaboration of the text, and so facilitate the construction of a mental model [Paoletti 2011]. Another theory that has made a great contribution to the understanding of the relationship between images and learning is the Cognitive Load Theory (CLT) by Chandler and Sweller^[3]. This theory focuses on the concept of cognitive resources available during the execution of a task and how those resources are used and directional during learning [Chandler and Sweller 1991]. For the Cognitive Load Theory, learning involves the construction of mental schemes and their automation. The schemes are internal representations capable of mediating between the information coming from the environment and knowledge that the subject already possesses. The memory system is the tool that makes this possible link. It is formed of three major subsystems: the sensory memory (MS), the working memory (ML) and the long-term memory (LTM). For the CLT learning can be optimized if the subject efficiently employs its working memory in the construction of mental schemes required by the task.

In this respect, Sweller has developed the concept of cognitive load, which was defined as the load imposed on the working memory from information presented [Sweller 1988], also understood as the mental effort perceived by the student during learning. The cognitive load can be of three types: alien, inherent and relevant. The extraneous cognitive load is associated with processes that are not directly necessary for learning. That is instead determined by the interaction between the intrinsic nature of the contents to be learned and the student's pre-knowledge while the relevant concerns processes that are directly associated with learning, namely the construction and automation of patterns in the working memory. The theory was first concentrated on the reduction of external loads and later studied the treatment of intrinsic load which must be adapted to the student's needs through simplification operations of the material to be learned. Such material can be considered more or less complex in relation to the differences in the level of experience of the subject and, therefore, the presentation mode should be selected on the basis of pre-knowledge of the student [Landriscina 2011].

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4. The cognitive theory of multimedia learning

One of the most comprehensive theoretical models that try to explain the cognitive dynamics underlying multimedia learning is that proposed by Richard Mayer [Mayer 2000]. The author, taking into account the concept of doubleencoding by Paivio and of the concept of cognitive load by Chandler and Sweller, has developed an integrated model. Cognitive theory of multimedia learning is based on three basic assumptions. The first states that visual and auditory information processing takes place through two different channels. The second states that the amount of information we can process in each channel is limited so an undue burden hampers processing. The third basic assumption observes that learning takes place when the subject develops actively the information, i.e. when selecting the relevant information in each channel, organizes them into consistent representations and integrates them with each other and with those already held [Cornoldi et al. 2005]. The cognitive load theory and cognitive theory of multimedia learning have developed some real operational guidelines for multimedia design. In particular the first identified the effects produced on learning on the basis of how texts and figures are put together and on the basis of the characteristics of the user and Mayer advocated a number of fundamental principles to be taken into account in the implementation of products. The first is the principle of multimedia, which adds appropriate figures to a text, making it easier to understand. The second is the spatial and temporal contiguity principle that enhances the closeness between text and illustration. The third is the principle of consistency that highlights negative effects of irrelevant information. The fourth is the modality principle demonstrating the benefit of bimodal presentation (auditory and visual). The fifth is the principle of redundancy that critiques lodged information in many formats, such as: image, text and audio. The sixth and last is the segmentation principle according to which it is better to present the multimedia material in short segments controllable [Mayer 2000] [Landriscina 2011].

5. Communication and psychological functions of images

Sometimes a figure is enough to understand a message, but more often than not the interpretation of a message also requires some text. It is therefore appropriate to examine the relationship of figure-text, which is accomplished through the function that takes place within the text and vice versa. Many authors have ventured into typological classification of the forms of visual communication with different criteria. The authors distinguish between the surface characteristics of an image and its psychological and communicative functions. The surface characteristics affect the appearance of an image and the way in which it was created; communicative functions are for image transmission aspects, i.e. how the image conveys information. Psychological ones, however, relate to the way in which visual elements interact with the human cognitive system and provide useful information in relation to the purposes with which images can be used in teaching. The surface characteristics affect teaching effectiveness only marginally. The communicative functions and psychological ones, instead, make more effective use of the photo from the point of view of learning. According to the taxonomy of Clark and Lyons the communicative functions are: decorative, mnemonic, organizational, relational, representative, transformative and interpretive; while psychological functions are: support for the attention, enabling knowledge, cognitive load minimization, construction of mental models, support for the transfer of learning and support for motivation [Clark and Lyons 2010].

6. From theory to practice: the results of a research-ethics education and health promotion in Italy

Using some basic principles of visual communication, Cognitive Load Theory and Cognitive Theory of Multimedia Learning, the authors have designed and built an educational workshop for ethical values within an international project of health promotion focused on: "Developmental Trajectories of Pedagogy of Care Applied to Training Subjects", which involves Italian students (and some students from Ireland), between 9 and 18 years old. The first educational workshop of ethical values in Italy project involved 132 students in fifth grade curriculum and experienced experts (pedagogues, philosophers, psychologists and experts in graphic design) in collaboration with teachers in a southern Italian primary school in the first educational cycle: "G. Bovio" in Ruvo di Puglia (Ba). The premise for the project was based upon reflection on cultural and social contexts underlined by the previous two surveys of the juvenile condition in Italy Istituto IARD "at the beginning of the new century". They reveal the restlessness and confusion of youth in the face of the profound changes that characterize post-modernity and provide a mass of data of particular interest to pedagogical reflection #buzzi2002 #buzzi2007. A trait that characterizes the profile of young people currently is the loss of strong role models and the propensity to take references identity as flexible combined with the changing beliefs that include that there are no more gualities that are not transient, that our mortal soul "is rather a thousand fragments physiognomy" #bellingreri2014. Other traits that characterize the profile of young contemporaries are: lack of stability in interpersonal relationships; difficulties in communication; lack of shared languages; marked individualisation; narcissism; paroxysmal defense of personal freedom; subjectivation and misunderstanding of social standards; relationship difficulties with parents and teachers; widespread social and political disengagement; lack of guilt; sunset superego; aesthetic culture spread; hedonistic culture spread; attention to live in the present moment; great trust in the possibilities; and lack of hope towards the future.

This data confirmed, moreover, by the latest European research #EMCDDA2014 appears even more worrisome if matched to the World Drugs Report data #WDR2015. In particular, the report entitled "Prevalence of drug use in the youth population" #REPORT2015 reports the following data on the use of soft drugs, which cannot but cause concern among families and educators in various capacities: 39 % (10-12 years) North America (Canada), using cannabis at least once in 2014; 35 % (15-16 years) Czech Republic; 28 % (9-10 years) United States; 20% (15-16 years), Chile and Bulgaria; 11% (15-19 years), Italy. The SAR, the European agency that investigates the diffusion of psychoactive

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substances has reported a total of 101 new substances in 2014. These trends are clearly worrisome.

Thus it was in this context that the research question was born: What type of educational provision in the early years of schooling for pupils is necessary to prevent these trends and to promote the integral formation and the well-being of the human person? In tandem with the research focus was the desire for an integrated educational project, namely an active network that links formal and informal educational agencies to promote integral health and human wellbeing from the early years of life. In the school year 2015-2016 the "Quality of life" network was developed, involving different grade schools, institutions' families, local health authorities, associations of the municipality of Ruvo di Puglia, coordinated by the University of Bari. Following the suggestions of Edgard Morin, who advocates the importance of a new kind of education that can really teach people to live a good life, the educational workshop followed a twofold purpose: primarily aimed at youth health promotion, and included a pedagogy of cooperation between formal and informal training agencies, through a process of growing awareness of the potential and the risks that young people now face #morin2015. Secondly, the project aimed to explore with young people how to take care of themselves and others through the means of visual communication, writing fiction and autobiographical writing, to chart a new path of sustainable development ethics and inclusive education in a shared model.

7. Materials and methods

We believe the positivistic paradigm is inadequate to investigate some areas of education. Much of the essence of the educational phenomenon is as a unique and unrepeatable epistemic device that does not lend itself easily to the positivist lens. Epistemic ecological paradigm-related guidelines are best suited to investigate the world of education. That is why we chose to use quanti-qualitative tools and standards to investigate the particular scope of educational research represented by the ethical education of values, within a framework of full welfare and health promotion. There were several epistemic ecological paradigm-related underpinnings, which included a phenomenological approach, a critical approach and a participatory approach. These approaches express different philosophies which are not mutually exclusive. In this research work, in particular, we favored a phenomenological-hermeneutic interpretive approach, which takes account of empirical data. The phenomenological hermeneutic paradigm aims at the elaboration of scientific reports defined as "interpretative descriptions". It's mostly this paradigm, which has developed theories of phenomenological research as it applies to education. The starting point was the experience, to investigate networks and meanings that participants identified. The phenomenological methodology excludes generalizations. The essence of the phenomenological orientation is to be faithful to the phenomenon itself; the epistemic imperative is to "go to the things themselves". Things are not perceived as factual, but as elements of consciousness, objects of intuition, the essence of things revealed to consciousness. The researcher should, according to this paradigm, study things in their setting, knowing that they can manifest themselves in different ways according to the ways of accessing them. In order to be faithful to the phenomenon researchers should refer to the principle of evidence: and the authors adhered to this principle. They also recognized that phenomena do not always appear to be completely transparent to one's gaze, but rather that everything has its own specific way of transcending appearance. This makes the researcher humble and modest in the results obtained and motivates further research that can identify and promote empowering strategies that can contribute to new improvements for the human person.

8. An innovative teaching program with some principles and tools of visual communication

In the workshop, along with some Mexican folk patterns, representing some virtues indispensable for the integral development of the human person, we used the interactive whiteboard (IWB) that is a device that, when compared to other similar technological tools, is designed specifically for the school and with the school. As is with the size of a traditional whiteboard, on the surface it is possible to write, manage files, images, videos and browse the web resources. A projector projects the computer's desktop on the surface of the Board, on which one can interact through the use of a pen, a finger, a stylus or other device (Wikipedia 06/2013). The students were very interested in using the IWB. Our research shows that the digital whiteboard has a direct effect on the degree of students' participation in the lesson. The digital whiteboard has made possible a better presentation of content based on the use of images and

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movies that have attracted students' attention.

In the first lesson we explained to the pupils the purpose of the pedagogical laboratory. Projecting on the interactive whiteboard (IWB) the image replayed below (Figure 4), we presented the laboratory as an interesting research path to understand content and form of "virtue" according to a simple philosophical definition.



Figure 4. Image of children looking for something

A questionnaire was administered at the entrance to evaluate the socio-ethical affective literacy of the students involved 16 in the project. The questions concerned:

- 1. The definition of the concept of virtue according to the Western philosophical tradition.
- 2. The Aristotelian definition of cardinal human virtues.
- 3. The reason for the importance given by the Western philosophical tradition to the *paideia* of virtues in the education of the young generations.
- 4. The perception of pupils of a possible gap between education and training, theory and educational practice.
- 5. The perception of the existence, by the students, of possible gaps in the education given by the school.
- 6. The behavioral habits of pupils inside and outside the school.
- 7. The quality of interpersonal relationships with teachers, classmates and family members.
- 8. The importance of reading and reflection.
- 9. The use of new technologies inside and outside the school.
- 10. The influence of mass media, social networks and of the dominant culture over one's way of thinking.
- 11. Sense of satisfaction and well-being in the school.
- 12. Sense of satisfaction and well-being outside the school.
- 13. Possible educational needs not completely satisfied by the curriculum disciplines.

In the second lesson, according to the data from the questionnaire, a mini-course of socio-ethical-affective literacy was proposed. Using the means of *Visual Communication* (in particular the digital whiteboard, images, audio, video clips) we created an interesting experience of rapid literacy and interactive and cooperative learning. Subsequently, the pupils

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were divided into small groups and realized an artistic production related to the contents learned. The moment of final sharing was particularly appreciated by the students who had shown a team spirit in the groups. Only in one case, a child refused to work with their group mates and worked alone.

In the third meeting an interview was held by the children with the headmaster, the councilor for the education of the municipality to which he belongs, a psychologist and a doctor on the fascinating and little-known theme of the fundamental human virtues that help one to live well with oneself and with others. At the end of the interviews there arose a lively debate that involved the guests of the lesson and the interviewers. The simplicity and the frankness of the new questions of the children, who now went beyond the outline of the questions proposed at the beginning of the debate, questioned the same "experts". The principal of the school and the commissioner thanked the students for this meeting and promised to continue to question themselves on these issues so crucial for their private life and for the important profession that they play.

In the fourth lesson, the virtue of generosity was presented to the students through the story of Oscar Wilde's "Little Prince". Animated video clips kept pupils glued to their chairs for almost an hour. At the end of the viewing, the children were invited to enter their past, to look for an episode of generosity, the most significant and unforgettable, really experienced as spectators / protagonists. After completing this mnemonic effort, the children were asked to write down individually the event that would then be shared freely with their fellow students. The stories told were simple, but one more beautiful than the other.

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In the fifth meeting the gratuitousness of love was explained through the vision of part of "Beauty and the Beast". Below we have created an artistic workshop in small groups. The best job was put on the school website. The "homework" was, like at the end of each meeting, the imitation of virtuous models to be happy. The smiles and serene faces of the children seemed to us a sign of their interest and satisfaction. Also the fact that the students often remained in the classroom after the bell sounded and that some shouted: "We are still a bit", seemed to us a sign of their interest in the themes and teaching methods.

For the last lesson we organized an educational experience of Intergenerational Exchange between the students and the elderly, guests of a retirement home. During the meeting-party there was the mutual presentation of pupils and elders, through the support of a video clip, the interview, made by some students to the elderly, the delivery of a flower, drawings and poems of children and the sharing an ice cream. The children and the elderly were smiling and some held hands and sang. At the end of the party we again gave the students the initial questionnaire to perform a comparative analysis.

At the end of the educational experiment we can affirm, in agreement with what is said in the literature (#wall2005; #slay2008), that using the means of *Visual Communication* (in particular the digital whiteboard, images, audio, video clips) we pursued the following purposes:

1. INCREASE MOTIVATION AND PARTICIPATION:

- Make the most engaging lessons;
- · Keep the student's attention and make the most interesting content;
- Promote interaction with content, teachers, within the class.
- 2. RESPONDING TO THE BEST TO DIFFERENT COGNITIVE STYLES AND LEARNING:
 - Integrate different languages (oral and written, iconic, multimedia, etc.).
 - Allowing the manipulation of learning objects and the activation of all the sensory channels.
 - Allow and encourage various forms and multiple approaches to learning.
 - Allow to overcome the digital divide.

3. PROMOTE COLLABORATIVE AND COOPERATIVE LEARNING



Figure 5. Resilience



Figure 6. Prudence

Fig. 5 and Fig. 6 are examples of patterns that were used to explain to children aged between 9 to 10 some modern cardinal virtues expressed by the philosophical concepts of *resilience* (Fig. 5) and *prudence* (Fig. 6). Figures and texts have been put together on the basis of the characteristics of the users. We also followed three basic principles:

- 1. The *Principle of the Multimediality* by Landriscina [Landriscina 2011] which involves the use of appropriate shapes to the texts presented, useful to facilitate the understanding of the texts themselves.
- 2. The *Principle of Spatial-Temporal Contiguity* by Landriscina [Landriscina 2011] which values the proximity between text and figure in view of learning content.
- 3. The *Principle of Segmentation* by Mayer #mayer2011 who states that it is better to present the material in short controllable segments.

Referring to *Dual Coding Theory* [Paivio 1991] and to *Multimedia Representation Theory* we designed and implemented an educational workshop for primary school students. In the educational workshop we selected relevant information and organized it into coherent representations, so as to complement the knowledge already possessed by pupils [Cornoldi et al. 2005]. The presentation of the multimedia material, into small segments, has been alternating with the reading, by the teacher, of texts related to the subject. Each lesson ended with a graphic-pictorial production realized in small groups.

The guiding principle of the whole educational workshop was the *Principle of Bimodality of Cognitive Learning Theory* [Mayer et al. 2001] [Landriscina 2011]. It states that it is possible to demonstrate the advantage of bimodal presentation (auditory and visual). Following, also, the *Principle of Redundancy* of the same theory, which criticizes the presentation of the same information in too many formats, we avoided using the third format (audio), preferring the *bimodal presentation* [Mayer et al. 2001] [Landriscina 2011].

A virtues meter questionnaire

Our studies reveal that actually there is not a test to assess ethical literacy literature-values as this area of investigation is still little investigated, despite the recent bloom of research conducted in Italy around these important issues #moscato2014 #mortari2015. This is the reason why at the beginning of the workshop activities we elaborated and used a virtues meter questionnaire to verify whether the educational activity carried out from school (the first educational cycle: "G. Bovio") and family was efficient in relation to what Morin defines as the main objective of education: "teaching to live". In particular, through a set of questions that investigate thought and action of young people we verified whether the educational activity is capable of focusing the heart of the educational issue: the development of a thought useful for life. The basic hypothesis, confirmed by the international literature and statistical data (#baumann2011; #bellingreri2014; #morin2015; #ISTAT2014 on behavioral habits in young people; #IARD2014; #wrd2015), was that there are serious gaps in the current educational system, which is too much inclined towards the specialization and fragmentation of knowledge and marginally interested in the integral formation of the human person. In particular, the questionnaire pursued two principal research objectives:

- 1. Evaluation of the level of metacognition and ethical-valorial literacy;
- 2. Evaluation of behavioral habits, of futurization and level of satisfaction and wellness.

In detail:

a) In order to evaluate the concept of metacognition the following indicators have been utilized: Reading; Listening; Ability to remain in silence; Ability of reflecting on own actions; Ability to fix own errors. Instead, (Table 1).

b) in order to evaluate the ethical-valorial literacy the following indicators have been utilized: knowledge of Moral; knowledge of Virtue; good life habits; relations with Religion; relationship with Philosophy and with classic literature (Table 2).

c) In order to evaluate the behavioral habits, the following indicators have been utilized: Use of profanities; Critical issues in relationships, educational profit, the number of good deeds performed during the last week (Table 3). 27

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d) In order to evaluate the futurization, the following indicators have been utilized: dreams; work/fight (Table 4).

e) In order to evaluate the level of satisfaction and wellness, the following indicators have been utilized: to love and to be loved; resilience (Table 5).

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The present questionnaire has been validated based on the following criteria: 1) face validity or apparent validity; 2) content validity; 3) construct validity and, in detail, factorial validity. Face validity or apparent validity refers to the perception of detecting instrument on the part of those involved in the data collection and for which we have adapted questions to the subject of the search so that those questions were then recognized as valid in relation to the objectives of the research. The content validity refers to contents expressed by indicators, which should be consistent with how you plan to detect and represent the objectives of the survey. In our study the set of indicators chosen for a concept actually covers the entire domain of meaning of the concept in question. To do this we have controlled on a purely theoretical basis, decomposing analytically the concept studied in all its dimensions and ensuring that the indicator covers all through a review of the literature and listening to the opinion of several courts. Factorial validity can be seen in the correspondence between the contents of the hypothesis (the gaps in moral education) and empirical data that we obtained by the indicators (see T 1; T 2; T 3; T 4; T 5).

10. Results and discussion

These are the levels of the indicators obtained before and after the educational health promotion workshop. In particular, Table 1-5 show the levels of the indicators for the concept of *metacognition* (Tab. 1); for the *ethical-valorial literacy* (Tab. 2); for the *behavioral habits* (Tab. 3); for the *futurization* (Tab. 4); for the *wellness/satisfaction* (Tab. 5).

Reading	Listening	Ability to remain in silence	Ability of reflecting on own actions	Ability to fix own errors	
Before the Course	4%	7%	1%	19%	11%
After the Course	10%	21%	9%	31%	27%

 Table 1. Evaluation of the concept of metacognition. Average increase 11.2%.

Knowledge of moral	Knowledge of virtues	Good life habits	Relationship with religion	Relationship with Philosophy and with classic literature	
Before the Course	4%	9%	11%	17%	2%
After the Course	70%	83%	21%	41%	13%

 Table 2. Validation of the concept of ethical-valorial literacy. Average increase 37%.

Use of profanities	Critical issues in relationships	Educational profit	Number of good deeds performed during the last week	
Before the Course	21%	15%	27%	3%
After the Course	7%	4%	35%	7%

Table 3. Validation of the concept of behavioral habits. Average increase 25%.

Dreams	Work and fight			
Before the Course	12%	14%		
After the Course	47%	29%		
Table 4. Validation of the	e concept of futurization	n		
Table 4. Validation of the Level of satisfaction	e concept of futurization To love and to	be loved	Resilience	_
Table 4. Validation of theLevel of satisfactionBefore the Course	To love and to	n be loved	Resilience	4%

 Table 5. Validation of the concept of wellness/satisfaction. Average increase 21%.

It is clearly seen as the execution of the course has a positive effect on all investigated indicators.

In particular, an average increase of 11,2% was obtained for the indicator of *metacognition*. For the indicator of *behavioral habits* we obtained an average decrease of 11,2% in *use of profanities* among pupils. The *Educational profit* increased by 8% and the *number of good deeds performed during the last week* increased by 4%. The indicator of *futurization* increased on average by 25%. The indicator of *satisfaction/wellness* increased on average by 21%. The empirical analyses revealed educational changes which cannot be enclosed in rigid tables and on which it is worthy to reflect:

- Recurrent use of kind words;
- enthusiasm;
- curiosity;
- desire to learn new things;
- cooperativeness;
- industry;
- commitment.

The increase of the indicators combined with some qualitative observations encourages us to believe that the educational workshop achieved the planned objectives. The level of the concept of metacognition indicators (Fig. 7) reveal a significant increase in capacity of *reading and listening, ability to remain in silence, ability of reflecting on own actions, and ability to fix own errors* after the Course. Probably, as Luigina Mortari states, the ethical-valorial literacy acting on the cognitive and emotional level of the human person allows the development of silent and unused human potentials in our postmodern culture, which can convey true well-being #mortari2015.

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Figure 7. Level of the indicators of the concept of metacognition



Figure 8. Level of the indicators of the concept of wellness/satisfaction

Figure 8 shows the results of the level of the concept of wellness/satisfaction indicators. The increase in level of satisfaction, the ability to love, and the level of resilence encourages us to continue the research in the direction of ethico-values education supported by tools of *Visual Communication*.

Conclusion

We consider as truthful the postulate hinge of the scientific method according to which from the observation we pass to the theory. For what concerns the educational, we consider as truthful the postulate which affirms that the verification of the validity of a hypothesis takes place through educational practice. From this it derives that, given the results of the empirical survey conducted with the quali-quantitative method described, significantly unbalanced towards the confirmation of the receptivity and plasticity of intentional will or conscience and of the intelligence of the individual, it is legitimate to affirm, with an appreciable degree of scientific certainty, that:

- 1. Visual Communication Tools are able to support and intersect education;
- 2. Visual Communication Tools are useful for promoting health and well-being in schools;
- 3. *Visual Communication Tools* keep the pupils' interest alive for a time much longer than the oral and literary instruments of traditional learning;
- 4. *Visual Communication Tools* are particularly suitable for stimulating the intentionality of conscience in the search for truth and in socio-ethical-affective literacy.

Furthermore, the empirical experience conducted on the Italian sample leads us to consider the effectiveness of a socio-ethical-affective literacy for the development of metacognitive skills, proto-social skills and individual ethical postures of health and well-being within and outside the school.

These deductions, as we have shown in the previous arrays, are, however, in harmony and do not contrast with what was recently reported in the international literature.

An element of particular originality of the present work can be grasped in the choice of the application field in which to test the effectiveness of the new technologies in the didactic field.

The didactic use of new technologies to promote, through a socio-ethical-affective literacy, a new kind of wellbeing and the integral health of the students appears in Italy as an absolutely novel fact.

From the ability to convey new contents of education through new methodologies that complement, without replacing, the more traditional teaching methods, the integral renewal of education that can train man and the citizen of tomorrow may depend.

Notes

[1] i.e. images

[2] Mental models are internal representations that people use for understanding, reasoning and prediction.

[3] The theory is best known as CLT, Cognitive Learning Theory.

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