GRAPHIC, VISUAL AND IMAGE SCIENCES

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Visual sciences, image sciences and graphic sciences are just some of the different possible definitions that can be found in literature to define the field of investigation on the production, perception, visualization, reading and interpretation, of images.

Although they represent different approaches and disciplinary traditions, they are often used as synonyms. In this paper is discussed why terms so different in meaning are so interconnected and why it is impossible to investigate one of them without consider the others. *IMG journal, Image, Imagination and Imagery* has a great potential that is that of becoming a space of maturation, development and deepening for what can be called image sciences, or visual sciences, or graphic sciences. These definitions, which as will be explained below, are often used as synonyms despite the fact that the words they are composed of have profoundly different meanings.

The foundation of a new scientific journal in a time when scientific journals are multiplying vertiginously, questions us about its real meaning, and stimulates us to search for the deepest cultural reasons, going beyond the purely commercial, academic, evaluative and ranking logic both national and international.

A scientific journal must represent a space for discussion among scholars who share a field of investigation, or an approach, or a look.

A scientific journal needs a community of researchers interested in expressing their positions, in presenting their work on that editorial space, because they consider that particular public to be the most interested, competent and attentive.

A new scientific journal requires that there be areas of knowledge that have not yet been fully explored, whose boundaries appear blurred, whose contents need to be studied in depth, whose scholars need a reference that can orient their research.

For this reason, IMG journal, Image, Imagination and Imagery has a great potential that is that of becoming a space of maturation, development and deepening for what can be called image sciences, or visual sciences, or graphic sciences. These definitions, which as will be explained below, are often used as synonyms despite the fact that the words they are composed of have profoundly different meanings.

This field of investigation appears difficult to define, but two lines of research belonging to different disciplines, that of pedagogical matrix (Balchin, Coleman, 1966; Bleed, 2005) and that of cognitive psychology (Gardner, 1983) and psychology of perception (Massironi, 2002), can contribute significantly to their identification.

Starting from the studies from cognitive psychology and in particular from those of Gardner, it is possible to identify within the continuum of intelligences the graphic and visual intelligences that characterize the skills necessary for the production and reading of images and therefore to isolate the cognitive abilities that are the object of the graphic and visual sciences.

In the literature, such skills have been instead assimilated to other broader intellectual human abilities such as the spatial intelligence (Gardner, 1983). Actually, they also are considered an amalgam of skills, to the point that in this area of research the word visual often comes to be used as a synonym of spatial, because spatial human intelligence is closely related to the observation of the environment. Therefore, in this continuum of human intelligences, we can identify, confine and define the graphic intelligence (Cicalò, 2016) as well as the visual intelligence (Ferguson, 1978), which is certainly in close relation with other forms of intelligence and particularly with the spatial one. The spatial intelligence has been defined by Howard Gardner (1983) as the composition of different skills connected among them. They work as a family and are able to support each other. The ability to recognize images of the same object, the ability to visually transform an object in another or to recognize this transformation, as well as the skill to make a graphic representation of the spatial information belong to this family. Thus, the graphic skills would be part of the spatial intelligence and it would be also the basis of the ability to represent in two or three dimensions the real world by using symbolic codes, as in the case of geographic and topographic representations, diagrams, and geometric figures. The graphic intelligence, or the skill to use the graphic abilities, and more in general the coordination of eyes, mind and hands –perception, cognition and representation– in order to solve problems or to create products.

Of great utility are the studies of Massironi (2002) who analyzed the taxonomy of graphic products. Massironi selects the most relevant uses of drawing in human communication in different eras, for different objectives, without claiming to create an exhaustive taxonomy. Its diagram is drawn as a river ramification in which the different branches can intersect, disappear or originate other branches. According to this approach the model is continuously subject to transformation, deformation, expansion, reduction. The flow of knowledge is sometimes rapid and vigorous, others slow and stagnant.

The springs become extinct and then reappear. The flow is continuously directed towards the sea but the two main tributaries, that of representational and non-representational images, remain constantly active.

Another important contribution to the definition of the graphic and visual sciences comes from the pedagogical field in which many scholars are involved in defining what should be the necessary skills within the different educational curricula. Learning the languages based on signs, both verbal and non-verbal, concerns not only the decoding processes of the signs perceived but also the complex process of coding of the same signs. So, also the learning of images-based languages requires the development of the coding and decoding the visual information. Therefore, it makes sense to speak of graphic communications to refer to the coding of the message that will be then decoded through the perceptive processes usually associated with the expression of visual communication.

Generally by visual education, or image education, we mean both the understanding and the production of images (Bleed, 2005) but also in this case the definitions are not always shared (Brumberger, 2011) and the productive component is always relegated to marginal roles if not completely absent, as demonstrated by the diagram that Avgerinou and Ericson (1997) have built on the basis of the analysis of literature on the subject. The diagram represents the sphere of visual literacy as a family of competences concerning: visual perception, visual communication, visual languages, visual thought, visual learning. On the other hand, there are different competences in literature that are included in the graphic sphere (Delahunty, Seery, Lynch, 2011), such as skills in the fields of manual drawing, geometry, modelling, spatial thinking, visualization, problem solving and design. Although there are also in this list of overlapping with the sphere of visual and spatial intelligence, there emerges a strong connection but also a different connotation between graphicacy (Balchin, Coleman, 1966)–understood as the ability to communicate through visual messages such as images,

maps, diagrams, graphics, symbols and drawings–, and visual literacy, which focused on visual perception, visual communication, visual languages, visual thought, visual learning. Pedagogy and Psychology, together with Representation and Communication, have been the fields of investigation on which IMG has focused its attention since its first conference in 2017. Pedagogy and Psychology are precisely the areas that can be most useful in defining the areas of investigation of graphic representation and visual communication; the areas of investigation of what can be defined as graphic and visual sciences, in which the adjectives graphic and visual refer to the double relationship that can be established between the individual and the image: the individual as a producer of images and as a reader of images. Knowledge of the processes of perception makes it possible to define the strategies of graphic representation. The awareness of the perceptual mechanisms of decoding the image is the key to the design of encoding visual messages (Massironi, 1989). Knowing the cognitive paths of decoding, it is possible to define those of codification of graphic signs aimed at the transmission of messages through the visual channel. The study of graphic representation cannot therefore ignore that of visual perception. Therefore, the graphic dimension and the visual dimension are the two complementary dimensions of the images.

Graphic and visual actually identify two different faces of the same medal (Massironi, 1989) where the term graphic is linked to the coding of signs that is the basis of the production of images while visual is instead linked to the process of decoding the act of perception. Graphic representation and visual perception are two closely linked processes because in order to code the signs correctly it is necessary to know the mechanisms by which they will be decoded. However, in the literature also the terms representation and visualization are often used as synonyms if not as equivalents. Visualization is defined as a rigorous and systematic graphic representation of data, information and knowledge aimed at communicating and understanding what could not be communicated in

an alternative way (Lengler & Eppler, 2007; Yoon, 2017).

The sciences that aspire to investigate images have to be developed according to this double identity. For this reason, very often in international literature expressions such as image sciences, visual sciences and graphic sciences are used in an alternative way.

Visual sciences (Bertoline, 1998), image sciences (Mitchell, 2018) and graphic sciences (Suzuki, 2002) are just some of the different possible definitions that can be found in literature which, although representing different approaches and disciplinary traditions, are often used as synonyms.

In addition to being linked to different disciplinary traditions, the use of these expressions is also linked to linguistic considerations. The search for an expression that is universally recognized and identifying a particular field of study can be problematic due to the difficulties of translation. Translators select the most suitable words to express concepts, always making an approximation and a compromise (Eco, 2016).

In the Japanese disciplinary tradition, for example, the expression graphic sciences is used as a translation of the expression in which the ideogram is translated as graphic/graphical but could also have the meaning of drawing; image, diagram, figure, illustration. This conception of graphic sciences includes three areas: the theoretical one of geometry, the technical one related to representation and the cognitive and psychological one (Suzuki, 2002); an articulation very close to that used by Bertoline to connote the visual sciences, based on geometry, representation and spatial thought. It can therefore be said that often in literature the expressions graphic sciences and visual sciences are used to connote the same field of study. To further underline how ambiguous the distinction between these expressions can be, it is sufficient to think of how Gary Bertoline (1998) began his discussion in defining the visual sciences using the expression graphic or visual sciences, then preferring the expression visual sciences to that of the graphic sciences because, in his opinion,

the latter would be limiting because it is linked only to texts and images, while the adjective visual would be able to understand everything that the eye can perceive. This broadening of perspective that characterizes the use of the adjective visual is then highlighted in what in international literature are defined as visual studies that identify a field of study even wider that reaches to embrace art, aesthetics, anthropology, sociology, history, communication, design, photography and film (Barnhurst, 2004) , ie all those fields of knowledge based more on the production of the image on its perception and interpretation.

Therefore, in the light of this, if a new scientific journal requires unexplored areas of knowledge, whose boundaries appear blurred, whose contents need to be explored in depth, whose scholars need a reference to address their own research, then IMG journal, Image, Imagination and Imagery, with its interdisciplinary and international vision, can play a fundamental role by enhancing the experimentation already opened by the IMG conferences towards the exploration of the fields of investigation that define the graphic and visual sciences, or science of images.

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