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ENGINEERING GRAPHICS: SEMIOTIC ASPECTS

Engineering and technology students learn to perform the engineering drawing (graphical representation) as the reflection of an existing object or the geometric structure of a future object. According to Bense, the design object is a special type of sign in that it realizes a combination of particular characteristics from all three conceptual fields: geometry, semiotics and technology (Encyclopedic Dic., 1986). Consequently, the principles of design are semiotic by nature. To design means to structure systems of signs in such a way as to make possible the achievement of human goals: communication (as a form of social interaction), engineering (as a form of applied technical rationality), business (as a form of shared efficiency), etc. (Nadin, 1990).

An engineering drawing contains the form (lines), dimensions and alphanumeric data (words), based on different geometrical relationships and graphic codes, i.e. the main semiotic tools used by designers in visual representation. The basic course in this field of teaching is Engineering Graphics, which can be divided into two parts: understanding of the logical development of concepts, application of these concepts to practical situations. In other words, the course deals with geometrical variables in logical relationships as well as with graphic variables (semiotic tools) – both being properties of the universe (Cocchiarella, 2006).

In our treatment of the semiotic (graphic) drawing we proceed from Peirce's model of the sign (the systems of signs representing icons, indexes and symbols) and the triadic model of symbolic representation (see Figure) (Chandler).

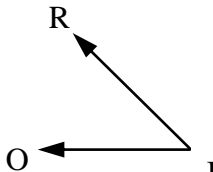


Figure. Form of symbolic representation. R-representamen: the form which the sign takes; I-interpretant: not an interpreter but rather the sense expressed by the sign; O-object: to which the sign refers.

The interaction between the representamen, the object and the interpretant is referred to as 'semiosis' by Peirce.

The form of a symbolic representation is based on conventions which are commonly accepted practices, rules, or methods. In the engineering drawing, the visual representation is given in a highly conventional way, expressing the meaning exactly and systematically. The design process is a process of encoding properties into an object; from the point of view of the user, it is a process of decoding these properties. A design code is thus a whole system of icons, indices and symbols, each of which made up of means of expressions and the impressions correlated with it. The elements (design code) of the graphic model include various images created according to standardized instructions (ISO Standards, 2003). These texts usually serve as monomodel, with the written text playing a very limited role.

At the beginning of each course irrespective of its content, it is reasonable to attempt to create for the student a framework or a wider picture of things into which it is possible to fit acquired knowledge.

Keywords: Engineering drawing, Semiotic tools, Representation, Triadic model

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