CLASSIFICATION AS A TOOL FOR ACQUIRING KNOWLEDGE

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Abstract: The most substantial deficiency of mathematical knowledge in our students is the formalism of their knowledge. The students’ memory stores knowledge as more or less isolated principles, precepts, formulas, algorithms, definitions and statements. Any interconnection or structure is missing. The worst problem is that the students feel no need to structure their knowledge and often disbelieve that they are able to do it. The basis of our research is to focus on these problems. The purpose of it is to identify and analyze cognitive and meta-cognitive functions which participate in building mathematical structures and to show the ways of diagnosing and re-educating misconceptions. The aim of this contribution is to provide concise information about one of these functions, which is classification. By classification, we mean: 1) a type of organizing a set of objects and phenomena; 2) a cognitive process which realizes such organization of objects and phenomena; 3) a cognitive function which a person uses during this process. In this contribution, we shall mainly focus on the latter two meanings of “classification”.

Keywords: association, distribution, gallery, classification criterion, classification game, cognitive function “classification”, class of partition, universe, ordering, outer classification.

Introduction

Classifying belongs to common thought processes. In school mathematics, students learn: that whole numbers are divided into three groups: positive, negative, and zero; that natural numbers are one-digit, two-digit, three-digit…; that triangles may be acute-angled, right-angled, obtuse-angled; etc. Such classifications are normally just transmitted to students and they are to accept them. Only occasionally may the students create their own classifications. First real need for classification normally happens so late as at higher secondary school when the students solve for example parametric equations, absolute value equations. All teachers are well aware how many problems these types of equations cause the students. We assume that one of the reasons for the difficulties is caused by insufficient preparation for the process of classification.

In order to develop the cognitive function of the students, it is necessary to