

SOME IMPROVEMENTS IN THE DIDACTICS OF MATHEMATICS AT PRESCHOOL TEACHER TRAINING COLLEGES

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Requirements to overcome the weaknesses that resulted from teaching separate subjects arose in the mid 19th century. The terms found in pedagogical literature, as are “concentration of teaching”, “complex systems”, “correlation of subjects”, etc. indicate this tendency to enforce integration of knowledge. Of course, such a disintegration of knowledge does not exist at the level of preschool education, but courses of didactics of mathematics for pre-service teachers should combine the subject matter with the basics of pedagogy and cognitive and developmental psychology. On such a basis these teachers should be acquainted with the genesis of elementary mathematical concepts as resulting from the spontaneous concepts of a preschool child. In describing our approach we rely on the generally accepted ideas found in current literature as well as on our own teaching experience gathered through work with students at the institution where we are employed.

We continue with a critical observation that concerns some possible programmes of teaching mathematics in the kindergartens (age 4–6), when they offer contents that are usually scheduled for the first class of primary school. When, in addition, this is accompanied with the insistence on calculation skills then it may be nothing more than a premature formalism. In order to explain our idea of preschool mathematics as activities through which the intuitive roots of elementary concepts are formed, we use the scheme according to which a concept is seen as the tripartite entity that consists of corresponding examples, mental image and name (symbol). Classification of examples and “discovering” of their inherent mathematical pattern result in the formation of the corresponding mental image. The activity of classification gets the form of games of equating examples with their standard representative (the example having the least possible amount of noise).

We illustrate this process using a variety of examples from arithmetic and geometry. This is also an instance where the Bruner’s iconic representation has to be appreciated as an inevitable means of shaping the acts of thinking of a preschool child. As one of our contributions we include representation of “numbers as visible shapes” (R. Arnheim), analyzing the requirements that the number images have to obey. At the end, we also add that we have implemented a number of advantages that modern information technology brings.