

INTRODUCING REASONING IN EARLY CHILDHOOD

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Argumentation and reasoning are introduced in mathematics education from early years. This demand the design of experience and activities that should help children to discuss their opinions, to explain their interpretations and justify their ideas in different situations (English, 1997). Based on this orientation, we explored the reasoning abilities of 4-5 years old children and implemented teaching intervention to improve these abilities.

The paper presents the results of a teaching experiment in pre-schoolers. First, the children have been tested in argumentation and reasoning activities including i) recognition of patterns and rules, ii) explanation and justification of their ideas iii) making conjectures (Hanna, G.& Janke, 1996). The intervention process lasted six weeks and consisted of 35 tasks. The designed tasks were problems, games, stories and constructions, extended in situations (such as shapes, space relationships and transformations, qualitative and quantitative characteristics and relations) that encouraged argumentation and reasoning procedures (Alexander, 1997, Edwards, 1998, Maher & Martino, 1996). After the end of the intervention, the children were tested again in the same abilities.

The results of how interventions of this kind can help young children enhance their reasoning abilities provide interesting evidence about mathematics teaching in early years. Pre-schoolers can be encouraged to reason based on their own life experience and their background knowledge, but their improvement in this field depends on the situations the educator will employ. This point will be discussed during the presentation of the research.

REFERENCES

- Alexander A. P., 1997: Analogical Reasoning and Early Mathematics Learning, in English D. L. (ed.): Mathematical Reasoning, Lawrence Erlbaum Associates Publishers, pp. 117-148.
- Bottle G and Alfrey C., 1999: Making sense of early mathematics, in David T. (ed.): Teaching Young Children, Paul Chapman Publishing Ltd., pp. 52-65.
- Edwards S., 1998: Managing the Effective Teaching of Mathematics 3-8, Paul Chapman Publishing Ltd.
- Hanna G. and Jahnke H. N., 1996: Proof and Proving, in Bishop A. et al (ed.): International Handbook of Mathematics Education, Kluwer Academic Publishers, pp.877-908.
- Maher A. C. and Martino M. A., 1996: Young Children Invent Methods of Proof: The Gang of Four, in Steffe P. L. and Neshier P. (ed.): Theories of Mathematical Learning, pp. 431-447.