

**Improving preschool mathematics  
education classroom practice quality by  
establishing links with research**

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# Objectives

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- To present how research findings in preschool mathematics education, concerning teaching effectiveness and programme quality, became the focus of an in-service preschool teacher professional development programme.
- How can research on mathematics education in preschool have a larger impact on the quality of everyday classroom practice?
- In what ways can research in mathematics education in preschool influence the quality of everyday classroom practice?

# Method of inquiry

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- The professional development programme (September 2013- December 2016) was materialized as three hour workshops- up to 25 participants at a time- 80 preschool teachers participated
- The aims of the workshops were for the participants to:
  - a) become familiar with the findings of the research study
  - b) become familiar with practical examples of how the research findings can be implemented in everyday classroom practice in order to improve teaching effectiveness and learning outcomes
  - c) design and implement mathematical activities in their classrooms

# Data sources

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- participants' evaluation of the programme
- participants' reflective diaries.

# Results and conclusions

| 1. Positive aspects of the programme   | 2. Benefits of participating in the programme   | 3. Free thoughts and feelings about mathematics education  |
|--|---|--|
| 1.1 Interaction with colleagues has been the most important aspect for me  | 2.1 Mathematics education is becoming clearer. I feel more confident to organise math activities now  | 3.1 I wish there were even more workshops  |
| 1.2 New ideas and perspectives guided from research  | 2.2 After every meeting I feel motivated to improve my classroom practice even more   | 3.2 I never thought I would become so passionate about teaching mathematics  |
| 1.3 The freedom to contact the educator any time and talk about my worries and fears concerning the implementation of the activities | 2.3 I have learnt: to guide children to observe, listen to each other and interact, organise a variety of activities, math should be fun and creativity   | 3.3 At last practical applications based on a grounded theory<br>3.4 I used to believe that research is for scholars. Now I realise that research can be as useful to us practitioners as well.              |
| 1.4 A perfect connection between research, theory and practice.  | 2.4 Mathematics education isn't about us creating impressive teaching aids. It's about the children discovering mathematics- and that they can achieve with the simplest of materials- everything can become a manipulative in preschool. | 3.5 After school I can't wait for the following day. The children's enthusiastic reaction to everything new I learn at the workshops and implement in class gives me energy and strength to learn even more. |
| 1.5 Guidance from professionals with sound theoretical and practical knowledge   |   |  |
| 1.6 Our active participation and the experiential nature of the workshops.   |   |  |

# Results and conclusions

| 1. Positive aspects of the programme   | 2. Benefits of participating in the programme   | 3. Free thoughts and feelings about mathematics education  |
|--|---|--|
| 1.7 Small groups. Everyone got the chance to ask questions and clarify ideas and misunderstandings   | 2.5 Through this experience I have learnt to listen to my children in class and let them lead the way. The workshops have taught me this. | 3.6 Now I realise that in the past the way I organised my lessons was teacher centred and lacked investigation and child initiation. |
| 1.8 I had the chance to work with new and different manipulatives and materials not on my own but with colleagues sharing the same questions and insecurities. | 2.6 Never could I imagine that preschool children have such great ability of working with complex mathematical ideas                      | 3.7 I didn't know what to expect of the programme. It has given me a new perspective, knowledge and practical experience             |
|  | 2.7 Now I know that every mathematical experience in preschool has the possibility of becoming a unique mathematical experience           |  |
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# Results and conclusions

|         |  |
|---------|--|
| Quote 1 | The long hours of the programme made me reluctant to participate. Now I realise that in order to change one needs encouragement, first hand experiences and time   |
| Quote 2 | Not all my children in class succeed in the same way while solving mathematical problems. But I see them all working patiently, persistently, not afraid to try out a new idea and take a risk- most importantly happy at the end of the process and proud of themselves |
| Quote 3 | Through my participation in the programme I feel I have gained professionalization in teaching mathematics in preschool  |
| Quote 4 | We have been attending the workshops every Saturday morning for 2 months now. I never felt bored, tired or restless. I wish we could do more   |
| Quote 5 | The programme has given me energy to start learning mathematics under a different view- creatively and critically  |
| Quote 6 | A worthy experience I shall cherish. The fact that we had guidance and feedback every step of the way made all the difference  |
| Quote 7 | I used to do mathematics with around 10 children participating in the activities. Now every child is an active participant and every child has experiences of success in mathematics.  |

# Results and conclusions

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- An effective way of research on mathematics education in preschool to have a larger impact on everyday classroom practice quality is through classroom teacher professional development programmes.
- The four elements of the programme having the greater impact on participants
  - a) small group numbers
  - b) systematic meetings
  - c) interactions with colleagues and researchers
  - d) constant guidance by the researchers

# Results and conclusions

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- Research in preschool mathematics education influenced different areas of participants' classroom practice:
  - a) preschool mathematics education methodological quality
  - b) preschool mathematics education ontology

# Educational importance of study

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- Establishing links between educational effectiveness research and classroom practice improvement is not only possible but beneficial as well
- The “putting theory into practice” nature of our programme gave the participants the chance to inform, alter and improve the quality of their everyday classroom practice.