INTRODUCTION

Nowadays, computer science influences our everyday life. In order to enable children to explore and understand the digital world they are living in, in Germany the focus shifts to the development of concepts and materials that allow preschool children to gain insights in computer science topics [1][2]. However, preschool children will not get in touch with these materials if educators do not integrate computational topics in early childhood education. Curricular and pedagogical beliefs as well as self-confidence of elementary teachers influence the selection and integration of topics [3][4][5]. In this aspect, previous computing experiences may be relevant.

EMPIRICAL STUDY

Two days of vocational training

Day 1
Introductory course

Day 2
Computer science workshop

Questionnaire

RESULTS

The model shows a main effect for childhood experiences, $F(2, 51) = 20.56$, $p < .001$, where computational experiences during childhood have a positive influence on self-confidence, $t(51) = 5.96$, $p < .001$.

For pedagogical beliefs, no influence was found, $F(2,50) = 2.12$, $p = .130$. Self-confidence did not change significantly with the two-day training, $t(44) = -1.15$, $p = .256$, neither pedagogical beliefs, $t(43) = .63$, $p = .535$ and $t(43) = .94$, $p = .351$.

DISCUSSION

Most of the participants highest school education was secondary school. Although computer science is part of the curriculum of secondary school, participants showed relatively low ratings of self-confidence in computer science. First results give a hint that own childhood experiences with computer science are correlated to self-confidence in teaching computer science. Short-term vocational training is not sufficient to change pedagogical beliefs and self-confidence. Self-confidence is different between women and men in male-dominated professions [6]. The sample of this field-study includes a higher part of women than men. Further analyses and research is important to see if the results for men in self-confidence obtained in computer science are similar to women.

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Computer Science in Early Childhood Education

Pedagogical Beliefs and Perceived Self-Confidence in Preschool Teachers

University of Bamberg

Figure 1. Creation of new material for the experimenters’ kit.

Figure 2. Preschool teachers trying out the materials of the experimenters’ kit.

Figure 4. Rating of topics for kindergarten work (measurement 1).

Figure 5. Rating of computer science education in general.

Figure 7. Influence of computational experiences during childhood on later educational work with children.