

Professionalization in Early Childhood Education: First results to model level thresholds for pre-school educators mathematical pedagogical content knowledge (MPCK)

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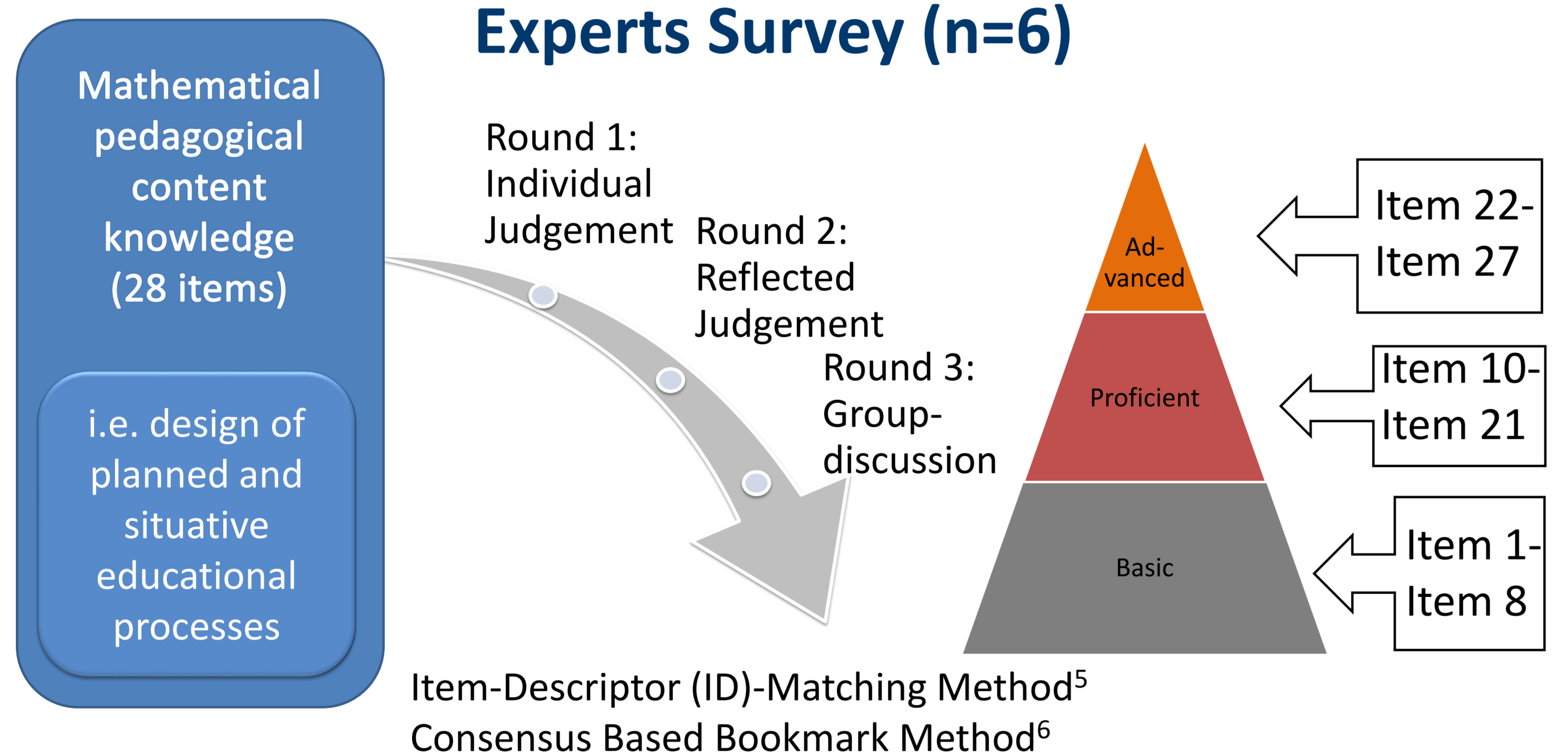
Background and Relevance

Due to results of international comparative studies and new findings of cognitive science, there has been a large increase of interest in the professionalization of pre-school educators. Professional competences of pre-school educators have therefore increasingly moved into the focus of educational sciences. Today German pre-school educators have to focus more on pre-academic skills such as basic numerical skills and mathematical thinking, although these are underrepresented in their own training.¹² Domain-specific knowledge is considered to be crucial for early childhood professionals in order to provide appropriate learning opportunities for early mathematical education.³ However, there are little empirical studies that have investigated which knowledge is needed.

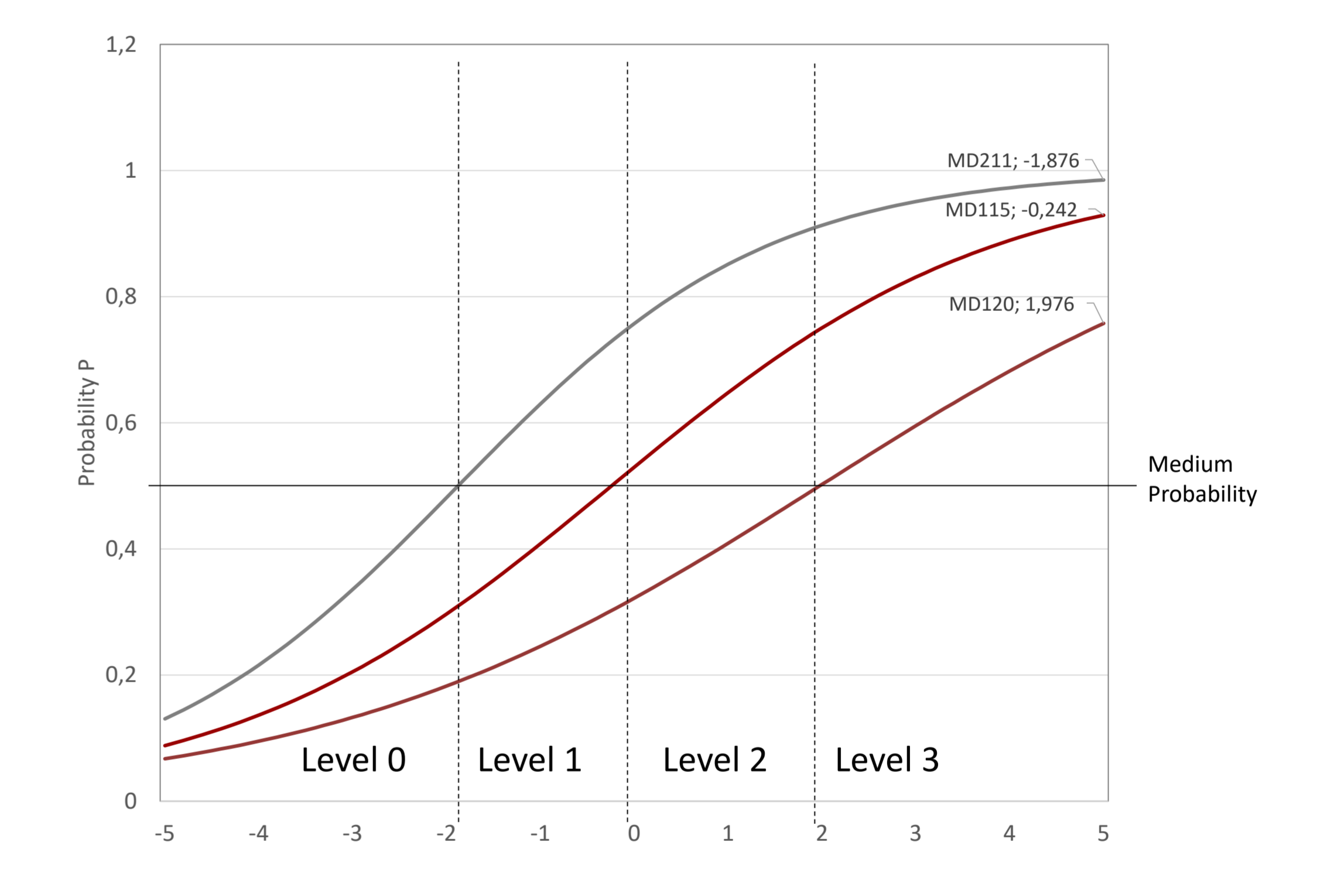
Purpose and Research Question

In the presented study, a power test from the KomMa project (structure, level and development of professional competencies of teachers in the field of mathematics, BMBF funded)⁴ is used to investigate the mathematical pedagogical content knowledge in order to answer the question: „Is it possible to identify and describe difficulty-determining characteristics for different levels of MPCK in KomMa by undertaking an expert survey?“

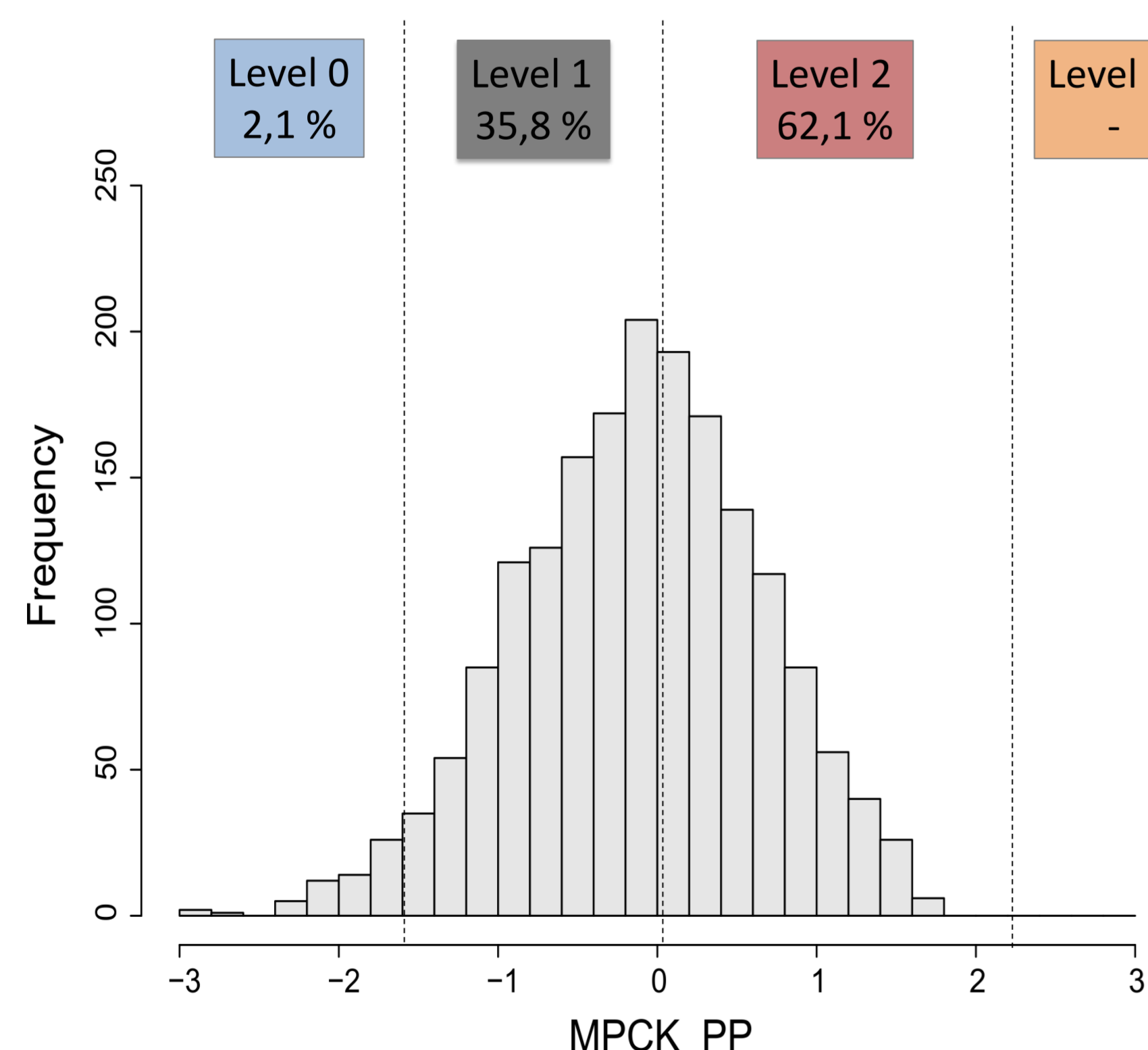
Experts Survey (n=6)



Item Characteristic Curve (ICC)



Levels KomMa



Summary and Results

Based on the sample of 1851 prospective pre-school educators, six experts were asked to identify three levels of difficulty, for basic, proficient and advanced knowledge. On basis of a 2PL model, items were presented in an ordered item booklet and item parameters were considered to set the final cut-off scores for each level. By discussing the content of the items and generalizing them based on difficulty-determining characteristics, i.e. cognitive requirements and domain-specific pedagogical content knowledge, the experts mostly agreed on item descriptions and level of difficulty. Prospective educators not yet reach the highest level. 2,1% are below basic requirements. It seems as they not yet have enough experience to design appropriate learning opportunities.

References

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