

# Development of Questionnaire about Demand of Parents for Mathematical Education to Harmonize family and generation of future era

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*The present study is intended to develop questionnaire items among South Korean parents and investigate awareness and requirement for cultural bond and communication between family and generations of the future era in a way of mathematical education.*

## Introduction

This research aims to develop a questionnaire to investigate the current status and demands of parents for mathematics education to harmonize family and future generations. The field of query has been categorized into two different aspects; the aspect of the state to assess recognition of an object of the query and the aspect to assess the personal variable of each object. To define the field and factors of recognition of the object of the query, recognition of state and phenomenon and satisfaction were separated. In addition, variables of personal background were defined as well for these could operate as additional factor. To secure primary validity, researchers extracted modified fields and factors by the using opinions from internal researchers and professionals in the field of mathematics education. Then, to secure secondary validity of the query and its factors for parents, they performed Delphi questionnaires, consulted with six domestic professionals, and confirmed validity by extracting field and factors of questionnaire for parents. As a result, for the questionnaire for parents with elementary school students, six questions were selected about personal background, seven for mathematical recognition of children and parents, five for teaching activities in the field of mathematics, and seven for general satisfaction concerning the field of mathematics. Additionally, the questionnaire for parents with middle school students, included five questions about personal background, eight for recognition of children and parents about mathematics, seven for recognition of teaching activities in the field of mathematics, and five for general satisfaction in the field of mathematics. This research has its significance as a foundational study for the mathematics education of the future generation.

## Research aims & background

The study aims to develop questionnaire items for South Korean parents to investigate the awareness and requirements for cultural bonds and communication between family and future

generations in mathematical education. McDill & Rigsby(1973) report that education aimed at the future society needs to be school education based on life cycle. It is necessary to recognize educational subjects such as teachers, parents and students and explore a way to participate in school education in preparation for the future society. (Tagiuri, 1968; Knowles, 1984). In this context, family math can be cited as a mathematical activity which acts as a tool for creating consensus about a common culture that is shared by family members as math education (Lee, 2012). Our research team aimed to analyze parents' awareness of mathematical activities and requirements to propose family math as a mathematical activity joined by the whole family as parts of math education for parents.

### **Theoretical foundation**

Although parents recognize the importance of mathematics such as AI and big data, they are overwhelmed by ambiguous concerns about methods. Han and Kim(2015) analyzed their awareness of the necessity of software education in elementary schools and obtained favourable outcomes regarding software educational policy and the necessity of software education in elementary schools. They conducted education on various types of software amongst parents and reported efforts for national promotion to include software education into regular elementary school curriculum. Regarding the perception of parents on math learning attitude of their children, Aiken(1974) defined attitude towards math as “personal learned orientation to respond positively or negatively in the situation associated with general mathematical objects or mathematical learning.” Moreover, Fennema & Sherman (1976) classified sub-factors of attitude towards math into success in attitude towards math, parents or teacher's attitude towards math learners, confidence in math learning, anxiety over math, participation motive for math and mathematical usefulness. The OECD definition (2013) included perspectives on math taken by people they considered important, the degree of consent to math class and the degree of consent to math they learn in schools were added in that sections. The implementation of a definitive achievement test OECD(2004, 2013) has a valuable implication in identifying the awareness and feeling of students who are the main subjects of learning. Questions on parents' attitude towards math are therefore an essential category.

Parents' awareness of learning was found to affect the learning attitude of children (Noh & Kim, 2001). Noh and Kim(2001) reported that elementary school students tend to rely more on parents in terms of studying. Thus, our researchers included successful experience in math, confidence, mathematical usefulness and value perception, anxiety and interest into specific contents in order to understand parents' perception on math. Oh and Hahn (2009) reported that parents tended to be deeply involved in the school curriculum according to their perception of and aspiration towards the curriculum. They also pointed out that middle-class parents who showed strong opposition to the entire current school curriculum, tended to be deeply involved in the curriculum. In addition, the aspirations of teachers who do not separate teaching from caring was similarly found in parents from all classes. Parents of high-attaining children respond to the curriculum rapidly.

## Findings

As a study to inform future mathematical education policy in Korea, this study developed questions and analyzed results to explore family union through mathematics. The results showed that parents demonstrated favourable awareness of the usefulness of the math subject and indicated specific methods they would like to see in math classes and parts needed to support math learning in the future. Educational experts should take this into account. Parents' perceptions of the usefulness of math was favourable and value awareness of math was also identified as positive. The following summarise these findings. First, a survey among parents with elementary and middle school students revealed that as more parents participate in education, they become highly satisfied with math learning and activities. Regarding this, it should be said that math education for parents is required in the school level. Second, a math classroom is needed for mathematical activities of the future era in accordance with requests by parents. Third, we propose that family mathematical empathic activities are encouraged since these contribute to creating empathy between generations and cultures.

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