# Doctoral Consortium Application

- **Title, name, name of institution and supervisor(s), year of Ph.D.**

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- **Introduction:**

Many countries focus on developing digital skills in children from an early age. Schools are updating educational programs, and making additions to the curricula. Children's digital literacy plays an important role in their development, starting from elementary school. ICT teachers should be ready to teach digital literacy (digital culture) and should know how to develop children's digital skills. The research aim is to assess the level of development of digital skills among primary (elementary) school students. This study will have a positive impact on achieving Kazakhstan's goals in the field of digital literacy and will be useful not only for Kazakh primary schools but also for foreign schools and teachers in other developing countries.

- **Research Question:**

1) How to assess the level of digital skills development of primary school students?

2) Which assessment tool should be used to measure (assess) the digital skills of primary schoolchildren?

- **Methodology:**

For this purpose, the author conducted online two questionnaire surveys among ICT teachers in Kazakhstan primary schools. The first questionnaire 462 participated teachers and the second questionnaire are 289 respondents. The questionnaires included questions regarding a real situation in teaching computer science at primary schools and general questions about teaching, professional qualification, requalification, training courses. Also, the questions concerning digital literacy. The results helped to know the real situation at elementary schools, the availability of computer equipment, the Internet, textbooks for students and teachers, the qualifications of teachers, teaching methods, and other conditions for successful teaching informatics and digital literacy development of students in grades 1-4 (elementary education in the Republic of Kazakhstan).

The author conducted online interviews with 14 Kazakh ICT teachers and attended and observed ICT classes online in one rural Kazakhstan school (4th grade) to know what teaching methods and educational/programming tools the teacher used for developing children's digital skills. The analysis of obtained replies from the ICT teachers was done using MAXQDA and NVIVO tools.

In addition, to better understand the level of digital skills of younger schoolchildren, the author conducted an ICT activities (1 week) for children in the IT lab at ELTE University.

At the same time, for implementing research purpose and finding an answers for research questions, the author started to conduct ICT classes for 5th grade

elementary school students at the International School of Budapest (ISB) with the ICT teacher together.

- **Related Work:** main publications

Katyetova, A. (2023). Development of Algorithmic and Programming Thinking at Primary School in State Educational Programs. *Trends in Education*, *15*(1), 26–36. http://doi.org/10.5507/tvv.2023.001

Katyetova, A. (2023). Teaching Computer Science in Kazakhstan Primary Schools: Current State, Problems and Perspectives. In *INTED2023 Proceedings* (pp. 2524–2531). http://doi.org/10.21125/inted.2023.0710

Katyetova, A., & Stoffova, V. (2023). Analysis of ICT Competencies and Skills of Primary Schools Informatics Teachers. In *INTED2023 Proceedings* (pp. 4040–4048). http://doi.org/10.21125/inted.2023.1073

Katyetova, A. D. (2023). Formation of digital literacy of primary school students in computer science lessons/Формирование цифровой грамотности учащихся начальной школы на уроках информатики. *Pedagogical Bulletin of Kazakhstan*, *1*(2), 35–51. http://doi.org/10.52301/1991-0614-2023-2-35-51

Stoffová, V., Katyetova, A., & Obonya, J. (2023). Informatics in the First Level of Primary School. In *EDULEARN23 Proceedings* (p. 4155-4164). http://doi.org/10.21125/edulearn.2023.1110

Katyetova, A. (2023). The Role of Online Learning Platforms in Teaching Computer Science at Elementary School. In *ICERI2023 Proceedings* (pp. 2231-2235) http://doi.org/10.21125/iceri.2023.0619

- **Results So Far:**

The author completed two research projects entitled (1) “Digital Literacy Development of Primary Schoolchildren: Recommendations for Developing Nations” and (2) “Creation of an Online Learning Platform for the subject of Computer Science in Elementary School”. The recommendations for developing countries were presented and the Informatics course was created in Canvas Instructure for primary school ICT teachers and their students (work continues supplementing the content for testing the course at ISB). The list of main publications is given above, another article is in the process of revision (literature review).

- **Open Questions:**

1. Can I assess/measure the level of children’s digital skills if teach ICT classes (including the pre and post-tests among 25 pupils) in one group for only two months? Is this case suitable for obtaining the research result?
2. What kind of assessment tool or tools are better to use for this purpose?
3. Can I use only a limited set of digital tools (micro: bits and their simulators, Lenovo tablets and existing gadgets at school, etc.) for assessment of level of children's digital skills?
4. How to properly develop level-based tasks for this (from a scientific point of view) and what tasks will help determine the level of children’s digital skills?