



Identifying Needs of Robotic and Technological Solutions for the Classroom

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Presentation overview

- Introduction
- Methods
- Results
- Discussion



Introduction (1)

- The European Parliament resolution on Civil Law Rules on Robotics (2017) emphasizes the belief that robots will exert an even broader and positive role in people's lives and their jobs than it is expected before.
- Different kind of technological advances will be used: unmanned aerial vehicles, robots designed to assist in healthcare for the elderly, surgical robots and wearable (cyber physical) systems.
- Consequence: shared integration between human and robotic capability should be taken into concern, due the robots should not be thought of as human substitutes.
- Declaration draws attention that educational processes have a much more important role than the reflection on the use of robots and/or innovative technology as a teaching tool.

Introduction (2)

- Question - how to introduce innovative technologies into the educational process in different areas within the Alpe-Adria-Danube region?
- Perspective of all those who are directly responsible for it:
 - teachers;
 - professionals who directly participate in the education process
 - parents.
- Paper presents preliminary results of the questionnaire (QR) that was conducted during April and May 2018 in three countries: Bulgaria, Greece and Croatia.
- The QR is part of the activities within project funded by Danube Strategic Project Fund (DSPF): Increasing the well being of the population by RObotic and ICT based iNNovative education (RONNI).



Methods (1)

- First questionnaire was carried on with the parents of the students from primary school.
- Questionnaire consists of 4 parts:
 - (1) general questions,
 - (2) questions related to the role of Robotics and Information Technologies (R&IT) in cognitive development;
 - (3) questions related to the role of R&IT in social development of children;
 - (4) questions related to the Policies.
- 36 questions in total
- The sections about cognitive and social development in the questionnaire are based on the general psychological theory included in university textbooks

Methods (2)

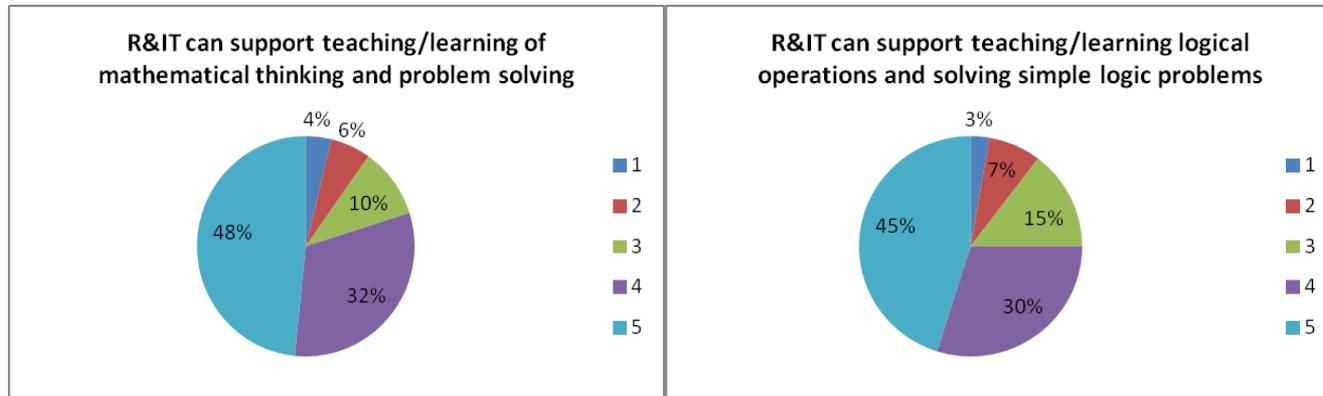
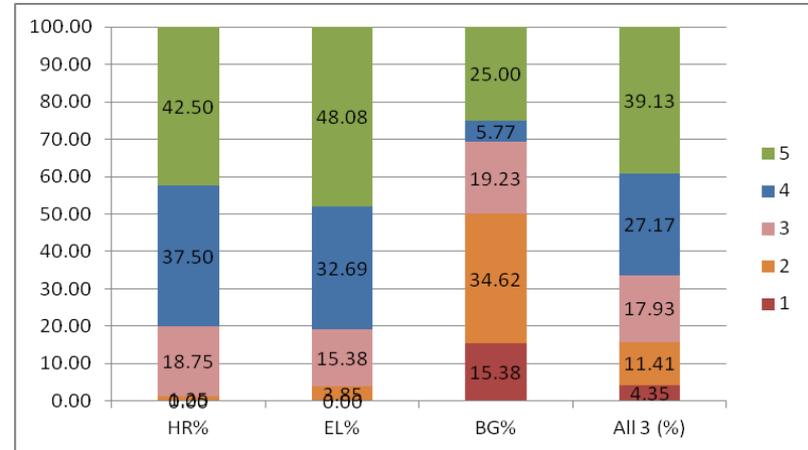
- Second questionnaire was prepared for the teachers and experts in the field of robotics and informatics technologies.
- The same four groups of questions as the questionnaire for the parents but some questions were different because of different type of engagement in education process.
- 38 questions for this group in total.

Methods (3)

- The questionnaire for teachers was prepared and carried out using Google forms.
- Questionnaire for parents was mainly carried out using paper versions although Google form version was also prepared.
- Questionnaires were prepared in three languages and conducted during April and May 2018 in Bulgaria (BG), Greece (EL) and Croatia (HR).
- The questionnaire was conducted in Bosnia and Herzegovina but these results were not included in this presentation.
- 184 questionnaires were answered by the teachers and experts
- Parents answered 179 questionnaires in total
- Majority of questions were Likert-type ranging from 1 (strongly disagree) to 5 (strongly agree).
- Remaining questions were multiple choice types.

Results (1)

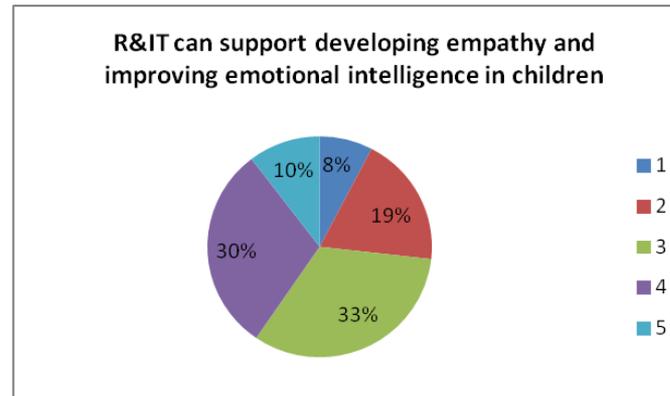
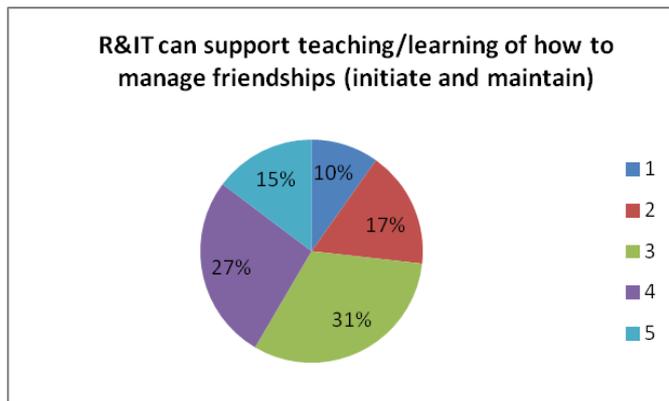
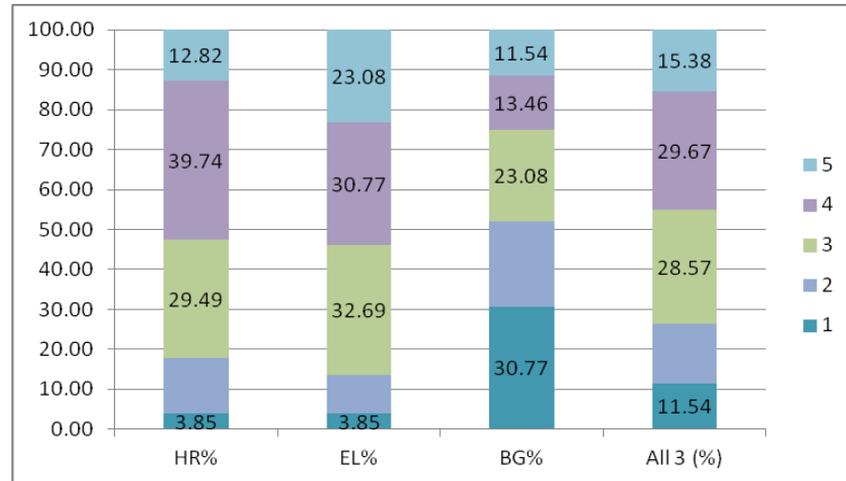
- "R&IT can support visual orientation and mobility skills".
- 1 - strongly disagree; 5 - strongly agree.
- Last column represents cumulative results for all three countries. (Part 2, Question #1, QR for teachers and experts).



Part 2, Questions #2 - left and #3 - right graph, QR for teachers and experts

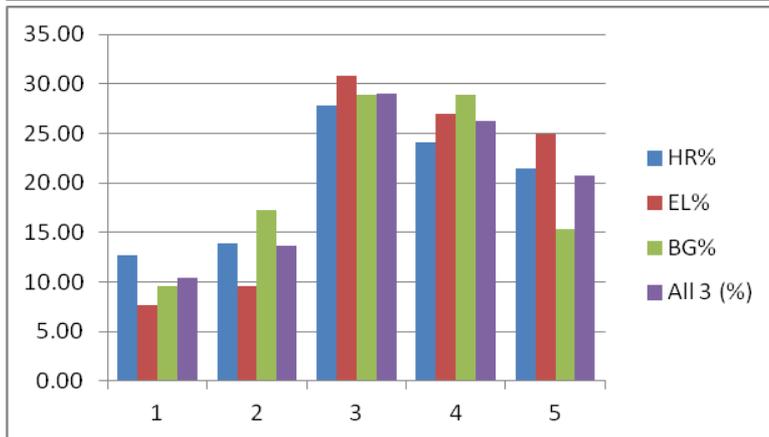
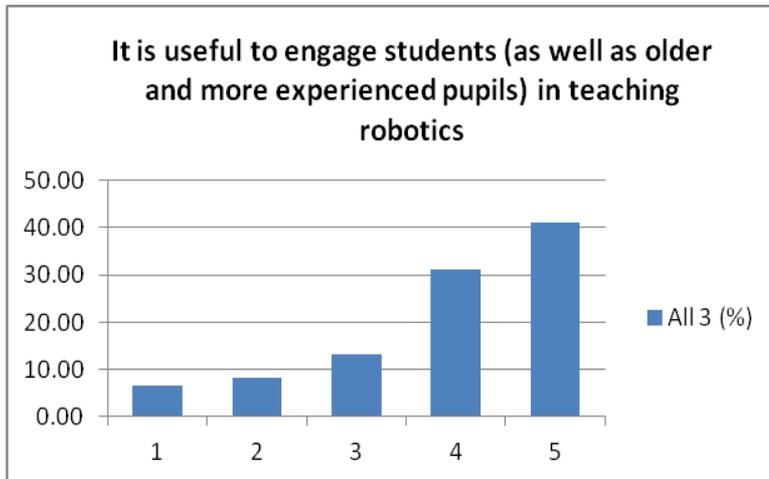
Results (2)

- "R&IT can support teaching/learning conversation skills "
- (1 -strongly disagree; 5 - strongly agree).
- Last column represents cumulative results for all three countries. (Part 3, Question #1, QR for teachers and experts).



Part 3, Questions #3 - left and #4 - right graph, QR for teachers and experts

Results (3)



Cumulative results for Croatia, Bulgaria and Greece

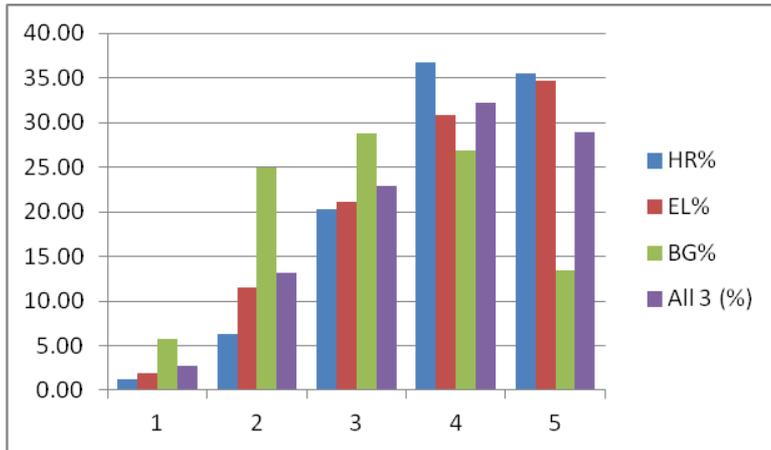
1 - strongly disagree; 5 – strongly agree.
(Part 4, Question #1, QR for teachers and experts).

“Robotics should be a mandatory course at school”

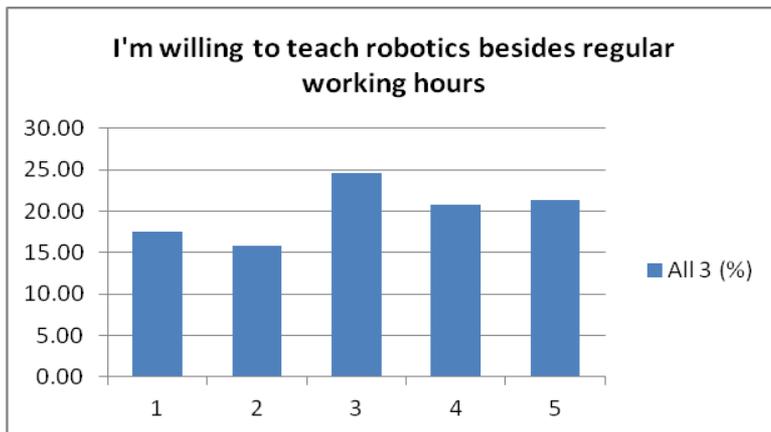
1- (strongly disagree) to 5 (strongly agree).
Last column represents cumulative results for all three countries.

(Part 4, Question #2, QR for teachers and experts)

Results (4)

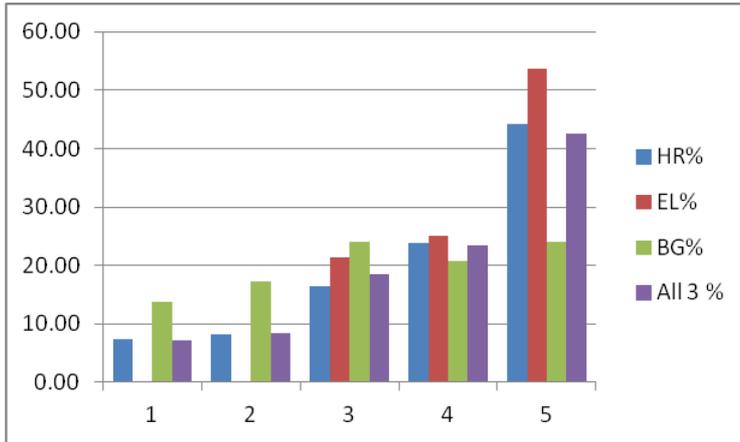


“R&IT topics should be part of existing mandatory school courses,,
 1- (strongly disagree) to 5 (strongly agree).
 Last column represents cumulative results for all three countries.
 (Part 4, Question #4, QR for teachers and experts)



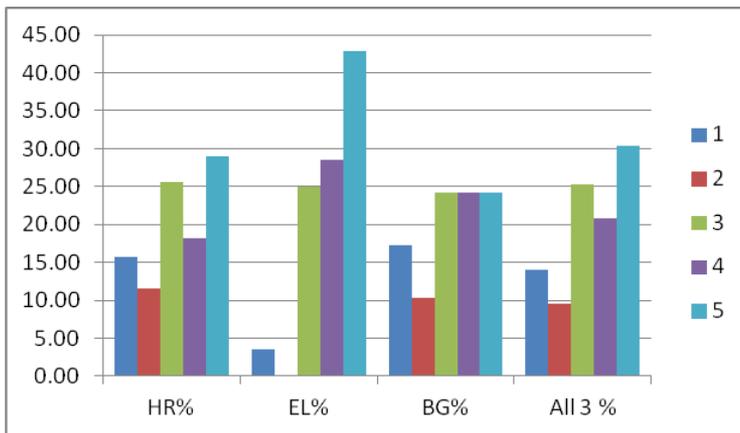
Cumulative results for Croatia, Bulgaria and Greece
 1 - strongly disagree; 5 – strongly agree.
 (Part 4, Question #7, QR for teachers and experts).

Results (5)



„It is useful to spend child's spare time for acquiring knowledge in R&IT.“

Results for Croatia, Bulgaria and Greece
1 - strongly disagree; 5 – strongly agree.
(Part 4, Question #4, QR for parents).



“Robotics should be a mandatory course at school”

1- (strongly disagree) to 5 (strongly agree).
Last column represents cumulative results for all three countries.
(Part 4, Question #2, QR for parents).

Discussion

- Although thorough statistical analysis and tests of statistical significance were not done (yet), it can be concluded that generally no significant differences were detected between surveyed countries for the most of the answers.
- Differences on idea of robotics as mandatory course between opinion of the experts/teachers and parents are perhaps smaller than expected although there is no decisive answer overall.
- There is definitely very positive attitude towards potential of robotics and information technologies as a support in teaching and learning.
- Less optimistic attitude has been reported on the role of R&IT in social development of children.
- Idea of including older pupils and students into teaching process has been very well accepted.
- Additional education of teachers as well as other type of motivation is needed.