Educating pre-service teachers in programming for schools : Block-based programming initiative in the teacher education program

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Summary

Our aim is to report the results of the impact of programming workshops on pre-service teachers in their professional development and how this initiative has improved their skills in programming. A positive and impactful learning response from the pre-service teachers is highlighted part of this research.

Background

- Digital Agenda for Europe (Coding the 21st century skill): The EU has put programming on its Digital Agenda for Europe and encourages Ministers of Education in member states to promote programming in schools.
- Digitalization Strategy for Basic Education 2017-2021 (Education & Research, 2017): As a part of this digital agenda for Europe, the Norwegian Ministry of Education has introduced programming (coding) in different courses at primary and secondary school levels in the revised curriculum (LK20) (Utdanningsdirektoratet, 2020a).
- EEA project- iTEM (improving Teacher Education in Mathematics): This project which is linked to the present research is providing a plateform to develope and improve the skills of mathematics pre-service teachers in the digitalization area specially in programming (coding) using micro:bit (Sentance et al., 2017) at the teacher education programme of the Nord University Norway and the TU Liberec Czech Republic.



Method

Participents (N=42): Pre-service teachers (39) and in-service teachers (3)

Study year Study program	Year-2	Year-3	Year-4	Others	Participant genders
MAGLU-program Bodø Campus Norway	7	19	8		Male 38%
Teacher Education program TU-Liberec Czech Republic		5		3	Female

Students were given different activites based on block-based programming during workshops. They were asked to make a digital dice with mico:bit. These tasks designed in view of revised curriculum (2020) for block-based programming.



Instrument: Online questionaire developed to check the workshop impact.



Results and Discussion

A clear shift is visible from very unsatisfaction level towards satifaction level in the left figure. Similary, the shift of views (confidence level) of participent about teaching microbit in schools can be notied in right figure.



Few anonymous comments of participants copied from questionnaire:

"I think the workshop was very interesting and educational. I think more time and more focus on programming would benefit me as a future teacher.

"Programming is very important for the new curriculum and I therefore feel like we should have had more programming throughout the years of the teacher education."

"The workshop we have had have been very good and I have learned a lot, but I feel that only two blocks with programming is not enough for this big field. I would like to have much more programming and more coding. Also more text-based programming."

Concluding Remarks

These workshops on programming have provided the positive impact on mathematics pre-service teachers learning skills. The participants have learned about the block-based programming and microbit. They have shown higher interest and confidence to use microbit in their future teaching practices at schools. Our next step will be to publish extended version of this work into an appropriate journal.

References

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Aknowledgement