Project Sustainability through Teacher Autonomy in CT Infusion

Deepti Joshi
Department of Cyber and Computer Sciences
The Citadel
Charleston, SC, USA
djoshi@citadel.edu

Robin Jocius
Department of Curriculum and Instruction
University of Texas-Arlington
Arlington, Texas, USA
robin.jocius@uta.edu

Melanie Blanton
The STEM Center of Excellence
The Citadel
Charleston, SC, USA
mblanto1@citadel.edu

Jennifer Albert
The STEM Center of Excellence
The Citadel
Charleston, SC, USA
jennifer.albert@citadel.edu

Ian O'Byrne
Department of Teacher Education
College of Charleston
Charleston, SC, USA
obyrnei@cofc.edu

ABSTRACT

There is growing attention for developing professional learning experiences for content area teachers to infuse computational thinking (CT). However, there is little reporting on how teachers continue to implement the CT lessons once professional development (PD) is over. This study provides initial results on our efforts of building project sustainability through teacher autonomy in designing their own CT infusion projects or PDs for their schools. Our initial analysis indicates the need to continue to build teacher autonomy within the professional learning experiences for developing teacher confidence and sustainability of the project.

1 INTRODUCTION/PROBLEM

The power and the perils of teacher PD for the infusion of computational thinking (CT) into content area teaching are well documented [1]. However, the how teachers sustain and grow new practices at the end of a given CT professional learning experience is missing. In this poster paper, we document findings from the final year of a four-year PD project, in which a subset of content area teachers and teacher teams (n=12) proposed, designed, and carried out their own CT infusion projects through a mini-grant program. The goals of this study are to analyze the choices teachers made in terms of project formats and outcomes, and to document teachers' experiences as they implemented their projects within their schools or districts. Findings focus on teacher choices in project types (curriculum development, teacher PD, and synergistic activities), as well as supports and barriers to project implementation.

Our study is grounded in research on teacher autonomy and the gradual release of responsibility (GRR) model to move teachers towards independence in CT lesson implementations. Adaptations of the GRR model include a fourth stage, true ownership, where learners determine new applications and extensions [2]. This study focuses on the true ownership phase, where teachers had autonomy in designing projects for their learners.

2 METHODS / RESULTS / CONCLUSION

Qualitative data analysis was conducted using constant comparative analysis and cycles of open and axial coding. Data sources included mini-grant proposals, teacher surveys, transcripts of pre- and post-project interviews, video recordings of post-project presentations, and infographics created to summarize teacher-led project goals. Projects fell into three categories: teacher PD, curriculum development, and after-school clubs or activities to connect in and out-of-school learning.

In conclusion, teachers' choices in project types were driven by context (e.g., rural location, limitations in terms of resources). Teachers stated that they felt more confident in their CT-infused teaching and more likely to continue to expand their knowledge after participating in the mini-grant program. Future work includes development of PD mechanisms that center teacher autonomy.

ACKNOWLEDGMENTS

This material is based upon work supported by the National Science Foundation under Grant No. 1742332.

REFERENCES

[1] Hestness, E., Ketelhut, D. J., McGinnis, J. R., & Plane, J. (2018). Professional knowledge building within an elementary teacher professional development experience on computational thinking in science education. *Journal of Technology and Teacher Education*, *26*(3), 411-435.

[2] Pearson, P. D., McVee, M. B., & Shanahan, L. E. (2019). In the Beginning: The Historical and conceptual genesis of the gradual release of responsibility. In *The gradual release of responsibility in literacy research and practice.* Emerald Publishing Limited.

SIGCSE 2023, March 15–18, 2023, Toronto, ON, Canada

ACM ISBN 978-1-4503-9433-8/23/03.
https://doi.org/10.1145/3545947.3576332