

Impact Sheet

Barnett, J. H., Clark, K. M., & Cihan, C. (2022). Transforming mathematics instruction via primary historical sources: A study of influential factors on implementation of a curricular innovation at the tertiary level. *Implementation and Replication Studies in Mathematics Education*, 2(2), 208–240. DOI: 10.1163/26670127-bja10006

1 Problem Addressed

The study concerns the TRansforming Instruction in Undergraduate Mathematics via Primary Historical Sources (TRIUMPHS) project. TRIUMPHS is concerned with using elements of the history of mathematics in tertiary mathematics teaching and learning by having them read and work with primary historical sources from past mathematicians. This is done through primary source projects (PSPs), which typically present students with introductory texts to a given primary source, or collection of sources, excerpts from the sources or the entire source, yet with the presentation often interrupted by explanatory comments, tasks, etc. This is to say, a form of ‘guided reading’. In this paper, the authors ask the following questions:

- What are the factors that influence an instructor’s first use of the innovation?
- What are the differences in the factors that influence the nature and depth of further or future uses of the innovation for various profiles of regular users of the innovation?

2 What is Implemented?

The PSPs are the objects to be implemented. These can be developed by any number of stakeholders, yet typically by members of the TRIUMPHS project, but also interested university or college instructors with some experience of using PSPs may potentially develop their own along the way or alter existing ones to fit their own practice. The purpose of TRIUMPHS is to produce such PSPs on core topics from the tertiary mathematics curriculum and then to investigate the resulting teaching and learning experiences.

3 What Is Researched and How?

Barnett and colleagues examine factors related to attributes of PSPs, characteristics of individual instructors who have influenced the incorporation of PSPs into their ordinary practice as well as the dissemination and support strategies of the TRIUMPHS project. This is done through case studies of two types of instructors: those whose usage of PSPs have been limited to a single course; and those for whom usage of PSPs have permeated their practice. Of a 119 instructors, 32 had particularly high experience with using PSPs.

4 Implications and Significance

The authors conclude that: “Findings affirm that pedagogical orientations within individuals’ instructional practices were critical to both initial use and eventual adoption of PSPs, while the observed differences in usage patterns between the cases were influenced by the perceived relative advantages offered by the core features of PSPs and individuals’ intrinsic motivation.”

What is unique in the TRIUMPHS project as compared to other implementation-related projects is the stakeholder configuration. The authors mention that Koichu et al. (2021), for instance, “found no examples in the literature in which practitioners initiated an educational change based on a solution of their own design in response to a specific problem that they had identified in their own instructional practice”. The authors hypothesize that the practitioner focus may have had an influence for some instructors, who saw the PSPs as a potential means to deal with issues they had experienced in their own practice, e.g., allowing students to witness the process of mathematical creation and thus to be able to engage more in the interpretation of mathematical ideas. In this respect, the authors also mention students’ identities in mathematics and speculate on the role of PSPs in relation to the instructors’ professional identities — a potential future object of study.

References

Koichu, B., Aguilar, M. S., & Misfeldt, M. (2021). Implementation-related research in mathematics education: the search for identity. *ZDM — Mathematics Education*, 53(5), 975–989. <https://doi.org/10.1007/s11858-021-01302-w>.