

Impact Sheet

Prytz, J., Ahl, L. M., & Jankvist, U. T. (2022). An innovation's path to the mathematics textbooks: A retrospective analysis of the successful scaling of the Swedish PUMP project. *Implementation and Replication Studies in Mathematics Education*, 2(2), 241–288. DOI: 10.1163/26670127-bja10005

1 Problem Addressed

Implementing innovations at scale is a difficult endeavour. Hence, it is interesting to study projects that have proven to have a large impact over time. In a retrospective analysis of the Swedish PUMP¹ project, which ran in the years 1973–1977, the authors investigate influential factors for the project scaling. Through analyses of mathematics textbooks from the time before, in close connection with, and a few years after the end of the PUMP project, the extent to which the innovations from PUMP had an impact on the content organization in the textbooks are investigated. Channels for spreading the ideas are identified through interviews with three key informants (Thomas, 2011). Using Coburn's (2003) dimensions of scaling to frame the dissemination of the PUMP project's ideas, the authors ask the questions: *How and to what extent were the content of mathematics textbooks in Sweden influenced by the results from the PUMP project?*, and *Through which channels did the innovations from the PUMP project influence the content in the mathematics textbooks?*

2 What is Achieved?

One innovation from the PUMP project was a detailed matrix for increasing the degree of difficulty in multiplication tasks for school years 3 to 6. It is found that after PUMP, all analysed textbook series to some degree had adapted to the sequencing suggested by the PUMP matrix. Thus, the project had a major

1 PUMP is an acronym for *Processanalyser av Undervisning i Matematik/Psykologvistik*, which would translate to Process analysis of Teaching in Mathematics/Psycholinguistics.

impact on the sequencing of tasks in Swedish mathematics textbooks during the analysed time periods. The interviews with the three key informants elicited six official channels for spreading the ideas of the PUMP project to teachers, publishing houses, and textbook authors. In addition, there were informal networks between stakeholders that facilitated the diffusion of innovations from PUMP.

3 Implications and Significance

Two interacting mechanisms enabled a market for mathematics textbooks that carried the PUMP innovations. First, the spirit of the times, where there was a void after the less successful New Math project that paved the way for teachers' wish for *back to basics*. Second, the mathematics textbook authors could quickly adapt to the demand of the teachers. An interesting implication of the study, concerning the well-known difficulty to implement innovations through textbooks (see for example Charalambous & Philippou, 2010), is that the nature of the innovation is a factor of influence. The authors hypothesize that an innovation that consists of a changed sequencing of the content, or an addition of content, can be successful without an implementation design for changing teachers' beliefs, provided the new content aligns with the teachers' mathematical knowledge.

References

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