Doing Mathematics in Different Places: an Exploration of Young People's Activities as they make Independent Use of a Web-Based Discussion Board

Elizabeth C. Jared

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Abstract

This study examined how young people are engaging with and doing mathematics, independently pursuing serious mathematical study, at home away from their classrooms, communicating with like-minded peers from anywhere in the world via the Internet, using the NRICH website and the AskNRICH web-board.

An Initial Study using a mixed methods methodology, including a web-survey, identified the current practice of NRICH problems being undertaken at home and students' perceptions of doing mathematical problem-solving in school. Results revealed a majority of NRICH users, predominantly high-attainers, independently choosing to work on problems, only at home and alone, believing that their teachers were unaware of this.

The Main Study used interpretative methods in an emergent research design to study AskNRICHers' interactions through analysis of some 5000 messages posted in 600 threads from three distinct but interlinked perspectives. Parallel commentaries separating the mathematics and actions in messages were constructed and subsequently coded. A prototype visualisation tool, 'a connection diagram', was developed to portray the complex networks of interactions, categorised by response type, linking participants and messages. Thus this work has resulted in the formation of a set of techniques, including some new elements, that can manage the complexities, size and nature of the task of analysing the AskNRICH web-board.

The findings characterising the AskNRICH environment have led to the proposal of the concept of a Second Learning Place, a specific type of Pupil Learning Place. In the empathetic environment of the AskNRICH Second Learning Place, the AskNRICHers collaborate, cooperate and show consideration and care to each other. Analysis of teaching and learning aspects demonstrates that the AskNRICH virtual world and the AskNRICHers' behaviours strongly promote a transformational pedagogy. The AskNRICH environment provides an exemplar of positive use of Internet-mediated communications leading to a harmonised mathematical experience in which the AskNRICHers are 'independent but not alone'.