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► To cite this version:

Róisín Neururer, Aoibhinn Ní Shúilleabháin. Investigating the concerns of post-primary mathematics teachers towards problem-solving following curriculum reform. Twelfth Congress of the European Society for Research in Mathematics Education (CERME12), Feb 2022, Bozen-Bolzano, Italy. fhal 03744277ff

HAL Id: hal-03744277

<https://hal.science/hal-03744277>

Submitted on 2 Aug 2022

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Investigating the concerns of post-primary mathematics teachers

towards problem-solving following curriculum reform

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Keywords: Teacher concerns, problem-solving, curriculum reform.

Background to the Research

In line with an international trend of curriculum reform towards a greater focus on problem-solving and mathematical literacy, significant reforms of mathematics curricula have taken place in Ireland in recent years. A new secondary curriculum was introduced in 2010 representing a comprehensive overhaul of content, assessment, and teaching and learning practices (Johnson et al., 2020). Incorporated in this reform was an attempt to move towards a more problem-solving approach to teaching mathematics. In 2015 the mathematics curriculum was revised once again for the junior cycle (ages 12/13 – 14/15). Classroom-based assessments (CBAs) were introduced representing a dramatic change in teachers' roles assessing their students' learning, as formal assessment in Ireland has traditionally been anonymous and centralized without any input from a student's teacher.

Teachers play a central role in the adoption of curriculum reforms and the successful enactment of reform depends on the teachers who will interpret and implement it (Spillane, 1999). However, educational reforms can aggravate teachers' concerns (Charalambous & Philippou, 2010), thereby influencing the implementation of reforms. Identifying and attending to the concerns of teachers can contribute to the successful implementation of educational reforms (Christou et al., 2004).

This research intends to gain an insight into the nature of Irish secondary mathematics teachers' concerns about problem-solving and asks the question: What is the nature of Irish secondary mathematics teachers' concerns with regards to problem-solving and the associated classroom-based assessment following recent curriculum reforms?

Methodology and Theoretical Framework

Hall et al. (1977) proposed seven "Stages of Concern" (SoC) which teachers experience as they implement a reform: awareness, informational, personal, management, consequence, collaboration, and refocusing. More recent studies have identified these stages of concern in teachers' interpretation and implementation of reform (Charalambous & Philippou, 2010) and found a pattern where teachers move through these stages, though not necessarily linearly, as a reform is introduced, implemented, and becomes established (Johnson et al., 2020). It has been suggested that the success of a reform depends on this development of concerns (McKinney et al., 1999).

This research uses a qualitative approach to generate data on teachers' concerns around problem solving and the CBAs. Semi-structured interviews were conducted with 12 mathematics teachers, representing a range of teaching experiences (e.g. gender, mathematical background, years of experience etc.) and school contexts (e.g. urban/rural; single-sex/co-ed; small/large pupil population etc.). The SoC framework informed the design of the interview and data analysis is being undertaken

using this same framework. The anonymized transcripts are being analysed through qualitative content analysis with the seven stages of the SoC framework serving as "a priori" codes.

Preliminary Findings

Following the initial phase of data analysis, the research provides a snapshot of participating teachers' concerns in each of the seven stages of the SoC framework. All participants demonstrated management concerns, most of which were related to time pressures with regards to classroom time within an already over-loaded curriculum.

Mary: It's just being able to facilitate [problem-solving] in the classroom under the time constraints seems to be a serious challenge to me.

Collaboration was a dominant theme. It was highlighted as a source of support but there was also an explicit desire for more collaboration with colleagues.

Cillian: I think having more opportunities there to engage with other schools around and share practice there would be the biggest thing.

Findings from this research will feed into the design of a specific teacher development initiative, where curriculum materials will be developed in order to provide targeted support for mathematics teachers enacting these reforms.

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