Workshop

Exploring the Role of an Online Interactive Platform in Supporting Dialogue in Mathematics Classrooms

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ABSTRACT This is a report of an interactive workshop that was collaboratively designed and implemented by a researcher and a group of practitioners. To share theoretical insights and teaching practices concerning the use of an online interactive platform to support classroom dialogue in mathematics classrooms, this article presents the theoretical and research underpinnings of the workshop, the procedure and main activities, the observed outputs, and reflection and suggestions on designing and organising the hybrid format of workshops in this field.

Keywords: Digital technology; Classroom dialogue; Lesson study; Primary mathematics education.

1. Introduction

There is a growing body of research evidence showing that productive classroom dialogue is beneficial for students' mathematical attainment and mathematical thinking development (e.g. Howe et al., 2019; Mercer and Sams, 2006; Webb et al., 2014). Recently, research interest has been increasingly drawn to the role of digital technologies in supporting classroom dialogue. This is mainly because affordances of digital technologies for learning (e.g., multimodality, interactivity, revisability) are argued to have potential in *opening, expanding and deepening dialogic space* (Wegerif, 2007). Within a dialogic space, multiple perspectives are openly shared, critically and creatively linked and synthesised and new meaning collectively constructed (Major et al., 2018). However, the realisation of any perceived potential of digital technologies requires pedagogical intention and practice. A one-year design-based research with Chinese mathematics teachers in a primary school was conducted with the research interest in optimising the technological potential in classroom dialogue. Based on the iteratively developed teacher professional development programme, a group of four mathematics teachers explored teaching strategies for using an online interactive platform, *Zoomabc (全景平台)* to support classroom dialogue. This workshop was not

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only informed by the related theories including socio-cultural and dialogical theories, but also grounded in the exploratory teaching practices in actual classrooms.

The workshop, bridging dialogic theory and classroom practice, aimed to enrich participants' understanding of the role of online interactive technology in mathematics teaching and learning, from the dialogic perspective. Hence, the workshop introduced Zoomabc and focused on illustrating and explaining its potential affordances for supporting classroom dialogue. The second aim was to share the pedagogical framework derived from the research in conjunction with the teaching strategies exemplified by real lesson cases. In addition, the workshop highlights lesson study as a means to professional development to support the development of dialogic teaching with digital technologies. To systematically analyse and scrutinise and reflect on dialogic teaching practices, a coding scheme, the Teacher Scheme for Educational Dialogue Analysis (T-SEDA) (Hennessy et al., 2021) was introduced. It is worth stressing that the workshop was designed and implemented in a dialogic manner, hoping to draw participants into an open, critical, and ongoing dialogue about the workshop theme.

2. Procedure and Main Activities

Based on the aforementioned aims, Tab. 1 outlines the procedure of the 1.5-hour workshop and its activities.

Tab. 1. The workshop procedure and activities

Duration	Activity	Format
10 min	Welcoming and ice breaking: specifying the workshop's main aims and structure. Inviting participants to share their interests, experiences and expectations related to the workshop topic.	Short presentation Publicly sharing ideas on Padlet
20 min	Introducing the theoretical and research backgrounds of the workshop, the lesson study model and the T-SEDA coding tool. The presentation ends with a brief demonstration of Zoomabc in terms of its technical features and potential affordances for classroom dialogue.	Presentation
15 min	Sharing lesson case one: making two-digit numbers using counters on a tens and ones place value chart. Q & A	Presentation and interaction
15 min	Sharing lesson case two: areas of rectangles. Q & A	Presentation and interaction
20 min	Adapting a short lesson episode 'Areas of Parallelograms'. This activity ends with an open-ended question: what factors should be considered and addressed when attempting to foster classroom dialogue with the use of interactive technologies?	Lesson planning and discussion
10 min	Conclusion with the proposed pedagogical framework. Inviting final comments and questions. Inviting participants to share any ideas and questions on Padlet after the workshop.	Plenary

3. Outputs

This workshop was conducted in a hybrid format, aiming to engage participants from diverse backgrounds. The first 20-minute presentation enabled participants to learn about the theoretical and research backgrounds of the workshop and enrich their

conceptual and practical understandings of educational dialogue. Some participants posed questions and shared valuable insights online mainly regarding the disciplinary nature of classroom dialogue in mathematics classrooms.

Given the dialogic approach to the workshop, participants asked questions and proposed alternative teaching approaches related to the shared two lesson examples. They agreed that the use of Zoomabc facilitated students' wider and sustainable participation in dialogue, especially contributing to fruitful opportunities for individual students to express ideas publicly and engage with each other's ideas. However, they pointed out that students' online comments may not be so dialogic and lack criticality, and some comments were not relevant to the contributions (e.g., commenting on writing rather than content).

Facilitated by the interactive activity for adapting the lesson episode and the open question, the pedagogical framework (see Fig. 1) and the accompanying pedagogical strategies were discussed both in this research context and in the participants' own contexts.

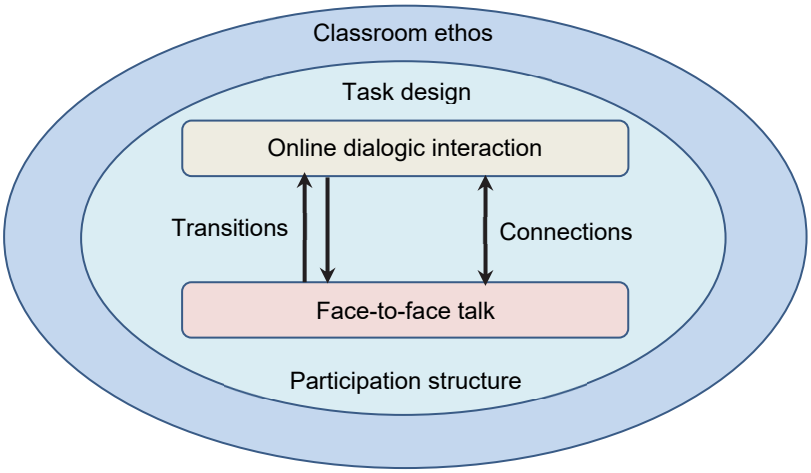

Fig.1. Pedagogical framework for fostering students' dialogic participation supported by using online interactive platforms.

4. Reflection and Suggestions

This workshop shared theoretical insights into the role of digital technology in supporting classroom dialogue and focused on the teaching practices concerning the use of Zoomabc, an online interactive platform. Taking the dialogic stance, the workshop enabled participants to share different viewpoints, raise questions, and co-construct understanding and knowledge surrounding this topic.

There are two aspects worthy of our reflection and suggestions. Regarding workshop content, it should be noted that the shared teaching practices and developed pedagogical strategies are situated in the specific context (e.g., the Chinese primary school, technological environment framed by Zoomabc). Hence, applying the

strategies to other contexts should be cautious, which requires contextual considerations. The intertwined inquiry between research and practice should be open, diverse and ongoing. Thus, it is hoped that the workshop as a catalyst can stimulate wider interest and encourage researchers from different contexts to further explore and investigate pedagogy for optimising the potential of digital technologies in supporting educational dialogue in mathematics classrooms.

The second aspect relates to the activity formats. To encourage participants' active, critical, and creative engagement, we designed hands-on and interactive activities. The dialogic approach to the workshop enabled us to create and develop an equal, supportive, open-minded, and co-constructive ethos. In corresponding to online interactive platforms, the use of Padlet enabled participants, both in person and online, to have a first-hand and authentic experience regarding how Padlet supported ongoing and cumulative dialogue across time and place. Therefore, future efforts may be needed to strengthen dialogic links between participants who are online and those who are physically present in the hybrid format of workshops.

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