

Participation and Non-Participation in Mathematics Classrooms

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Abstract

Active student engagement in mathematics is promoted in several contemporary policy documents. Recent international reports (Organization for Economic Cooperation and Development [OECD]) and national, (Department of Education, Training and Youth Affairs [DETYA], 2001) emphasised the need to improve mathematics teaching with a focus on learning and participation. The mathematics results from the Program for International Student Assessment [PISA] 2003 (OECD, 2004) the practices utilised in schools had a “substantial” (p. 26) effect on student learning and participation in mathematics. To understand how the practices affect student learning and participation, this paper discusses the use of critical discourse theory and a social theory of learning. In doing so, the important elements of these theories, that is, discourse, discursive practice, and subject position, have been linked to identity, participation and non-participation in classrooms. This articulation serves as a framework for understanding the complexity of practices in mathematics classrooms. It also serves as the platform to further understand the practices influential to participation and non-participation in and from such learning communities. The paper draws on several accounts from a larger study of students’ accounts of their experiences of learning mathematics. At the time, the students were enrolled in a Youth Reconnected Program. This program was designed to re-engage students with education.

Introduction

Improving student participation in mathematics in Australia is now the focus of governments and policy makers. Several national and state policy statements and discussion papers reflect concerns about student engagement in mathematics (see for example, Goos, 2004; Luke, et al., 2003; Ministerial Council on Education, Employment, Training & Youth Affairs, 1998). These discussions emphasise improving student engagement and participation in mathematics. The *National Goals for Schooling* (Ministerial Council on Education, Employment, Training & Youth Affairs, 1998) highlights the need for teachers to develop in learners “the capacity for, and skills in analysis and problem solving and the ability to communicate ideas and information, to plan and organise activities and to collaborate with others” (p. 3). The *Queensland Schools Reform Longitudinal Study* (Luke, et al., 2003) strongly recommends a renewed focus on student participation, and improved social outcomes and productive classroom practices. These documents provide the context for this paper that presents a social theory of learning and critical discourse theory as useful for understanding participation and non-participation in classrooms.

Learning, Participation and Identity

Learning and participation are considered to be social experiences that occur in social communities where students and teachers are the participants (Goos, 2004). In these communities, learning occurs as students engage with one another and in the tasks they are expected to perform. Participation is a complex process but one that is critical to successful learning in classrooms. It affords students a wide range of opportunities to be active members of classrooms. Students are required to develop the necessary skills of communication, negotiation, and decision-making when participating. Participation provides the setting in which they can construct and shape identities as members of a classroom (Wenger, 1998). Sinclair (2004) indicates that participation is *multidimensional* (p. 108) and distinguishes between passive and active participation. Active participation infers that students have reason to believe that their involvement can make a difference. Passive participation relates to being listened to or being consulted. Participation then, implies social inclusion.

Whilst student engagement is not a new idea in the research literature (see for example, Cobb & Yackel, 2001; Munns & Woodward, 2006), the emphasis is now on the practices that work to encourage students to actively engage in their mathematics learning. Engagement in this sense refers to reflective involvement in deep understanding, valuing what is being done and actively participating in mathematical tasks (Munns & Woodward, 2006). Thus, through student engagement and participation, comes a substantive sense of satisfaction and investment in learning. Students construct an identity in relation to mathematics learning.

An identity of participation is understood to be the ways with which students contribute to, and engage with others in the enterprise of a community (Wenger, 1998). In such a community, identities of participation are practised over time, and are considered works in progress constructed by the individual and collectively with others that gain coherence through participation (Klein & Saunders, 2004; Lewis & Ketter, 2004). Through this continued process, students relate with one another and with their teachers in a group or classroom. In doing so, an association develops whereby the experiences that are constitutive of an individual are applied through social interaction with others, in order for the student to be identified and recognised as a member of that community (Goos, 2004; Wenger, 1998). However, where students are unable to make sense of that community, and engage in the discourse they are more likely to be unable to participate effectively in its social life (Klein & Saunders, 2004; Sfard & Prusak, 2005). In such cases, they may be said to develop an identity of non-participation for that particular setting. In consequence, they risk marginalisation, exclusion, or withdrawal from their classroom learning.

Discourse, Discursive Practice and Subject Positioning

Critical discourse theory enables an exploration in greater depth of the discourses and discursive mechanisms traced in students' accounts of their learning experiences. This is not to say that critical discourse theory and critical discourse analysis [CDA] are principally concerned with communities or participation. However, they provide a way for these elements to be analysed more effectively. The term discourse, is defined in a number of ways (Chouliaraki & Fairclough, 1999). Chouliaraki and Fairclough (1999) define discourse as "the construction of some aspect of reality from a particular perspective ..." (p. 63). It can be thought of as ways of representing some aspects of reality (Rogers, 2004). Fairclough (2001) makes links between discourse and language, stressing that "language is a form of social practice" (p. 18). This usage of discourse echoes Lemke's (1995) description of discourse as the social activity of making meaning with language in social situations. That is, discourse is a social practice that constitutes and constructs meaning through language. The practice of discourse, is discursive and discursively represented (Chouliaraki & Fairclough, 1999). It constitutes situations, the social identities of, and relationships between people and groups (Fairclough, 2001).

Discursive practices are particular ways by which people produce the social, in work, play or the classroom. Through social interaction new social forms, that is, new social relations, new social identities, and new social structures are forged. The generative and emerging qualities of social interaction are crucial to gaining an insight into relations and identities that are produced socially (Chouliaraki & Fairclough, 1999). Discursive practices are both means and medium. They mediate experiences, relationships and interactions and offer possibilities to and impose constraints on learning across social spaces. They imply participant structures, ways of participating, and available identity positions (Hirst, 2004).

Within a discourse type such as mathematics, subject positions are constructed (Fairclough, 2001). In a sense, through occupying these positions, teachers and students are what they do – they become teachers and students (Fairclough, 2001). Discourse type refers to an element of discourse associated with social institutions (Fairclough, 2001). Participants are constrained to operate within the subject positions set up in discourse types. In one sense they are

passive, however, it is through being constrained that participants are able to act as social agents and can be creative (Fairclough, 2001). Creativity emerges through the combinations of ways that discourse types are used to meet changing demands and the contradictions of social situations (Fairclough, 2001). Through discourse, identities are constructed (Fairclough, 2001).

Identities are shaped through participative experiences where individuals share in the joint enterprise and mutually engage with others in communities, thus making sense and negotiating meaning contributes to shaping an identity (Wenger, 1998). This aspect echoes Fairclough's (1992) argument that identities are set up in discourse, that is, through meaning making in social practice. This argument reinforces Klein and Saunders (2004) assertion that through classroom practices and the positioning of students as mathematics learners, identities are established and created. Individual and collective identities are constructed through the discourse drawn upon. The relations with people are then shaped by the discourse/s in which and with which they engage to explain and understand their world and experiences.

Constructing an identity requires negotiating the meanings of the experiences of membership in social networks or communities. What people bring to communities reflects their social relations that are then understood through participation. In turn, their identities are shaped by belonging and participating in a social community. The conceptual framework constructed from this process of articulation provides a way for understanding student identities of participation and non-participation in mathematics classrooms. Understanding identity, participation, discourse, discursive practice and positioning provides a way to investigate how students locate themselves in discourses of participation and non-participation in classrooms.

Description of the Program and Participants

The study from which this paper draws was conducted at a small campus of Technical and Further Education [TAFE] located in Queensland, Australia. The campus offers education and training programs for a range of people wanting to access further education and or training. This campus offered the Youth Reconnected Program. The Youth Reconnected Program was a Commonwealth funded program designed to support early school leavers who had not attained a Year Ten Certificate. The program aimed to improve their literacy, numeracy, and life skills. However, young people who achieved a Year 10 pass were enrolled in this program as it provided them with access to further education and training. All forty-three students interviewed were enrolled in the Youth Reconnected Program at the college. Their accounts of their experiences stem from their participation at a college of TAFE and secondary school.

Analysing Accounts using Critical Discourse Analysis

Critical discourse analysis was applied to an examination of the students' accounts relating to mathematics education. This analysis allowed for constructing meaning from their experiences as students. It allows for ascribing meaning to such experiences. The identities dimension of discourse involves the speaker's authority about reality and how it is represented (Fairclough, 2001, p. 104). The modality of the speaker's evaluation is key to understanding this aspect. The ideological interest is in the authenticity of the claims or knowledge evident in forms of modality. Evaluation refers to the explicit or implicit ways that speakers or writers commit themselves to values (Fairclough, 2003). Evaluative statements are about desirability and undesirability, and or what is good or bad. This dimension serves as a framework for employing particular textual features to trace particular elements of discourse. The textual feature, deictic categories, was used. Deictic categories refer to the identification of who and what is included and excluded from a text. In doing so, the categories worked to socially organise who is included by time, distance, and the position of people "with reference to the 'position' of the speaker" (Smith, 1990, p. 56). This feature was used to locate who was present in the following account and to establish this student's identity as a learner in the program.

I just put my hand up and ask the teacher, and she, she just says if I'm stuck on something she'll do it for me, ah not really we both do it together and then she will make me do like three of them. She'll just write and do them, and then I get the hang of it and then she'll leave. (Interview, Cam, Program Student)

Who was present in the text can be identified by the use of the personal pronouns, *I, my, she, we, and me*. In doing so, they worked to construct this student's particular sense of self. This can be further explained through the identification of terms that worked to socially organise who was present in the text. The terms included, just, up, on, do, together, make, and leave. These terms worked to socially organise by space and time, the actions of the teacher and student. For example, the term, just, worked to indicate a moment in time, "I just put my hand," "she just says if I'm stuck on something she'll do it for me," and "she'll just write and do them." The terms mentioned above also worked to indicate spatially the social organisation of the teacher and student. For example, "we both do it together," worked to socially reference the teacher in relation to the student. This identification is important as it works to bring into focus the discursive practices used in the context, and the relations that worked to establish the student's identity. This construction worked to reinforce a definition of participation in the program. An identity of participation was traced in the following account by Robert. He indicated how he identified himself as a mathematics learner in the program.

It was difficult, like I was more immature then than what I am now, so difficult I would just switch off, and just not do it but now like we got them booklets here, and I just sit there and take as much time as I want, stay back, take the books home. The first book I copied a few things out of the back, and then I thought aah what is the use of doing that because I want to get into a cabinetmaking course. (Interview, Robert, Program Student)

The establishment of an identity of participation was traced in the evaluative terms, now good, and never been good. These terms indicate a high degree of commitment about his version of his learning. The first term worked to show a tacit sense of achievement in completing the textbook, and an incentive for shaping his identity as a cabinetmaker. However, this level of commitment was not the case for all of the students, as Diana indicates. Diana's account showed a high level of commitment to her particular version of the program. One presupposition from Diana's account is that given the negative claims that the student made about the program, opportunities to construct an identity of participation were less likely to occur because of the lack of organisation in the social situation of the classroom. Further, such an identity of non-participation was less likely to connect with learning, which means limited opportunities to access the program discourse.

Here at TAFE it is just really too easy for me at least and it is just so disorganised. The teachers have no control over the kids or anything; I would prefer to be in school. Yeah, I don't know at school, I didn't like it because they were strict and that but now that I am here I realise why. (Interview, Diana, Program Student)

This account worked to establish Diana's discontent with the program. The discontent was traced as oppositional to the program discourse. That is, where the program discourse was found to be supportive of the students' learning, the account showed that this was not the case for Diana. The opposition was traced through the use of intensifiers such as, too, just, just so and no, to indicate a high level of commitment to her particular version of the program. The intensifiers worked to affirm her preference to be at school regardless of her previous school experience. An identity of participation was traced in Leanne's account of her school experiences. In doing so, such an identity worked to indicate a sense of belonging to her class.

Yeah, in my classes I felt the belonging but it was just if you behaved or like I don't know. If you're not behaving you don't learn. It was a bit of both because I usually

contribute in class, like put my hand up and answer questions and that. Like I wasn't scared to do that at all but um. I also got along with everyone and everything else.
(Interview, Leanne, Program Student)

Expressive modality can be traced in the above account. The modal auxiliary verbs *do not*, and *was not*, worked to indicate a commitment to her version of her learning. In particular, that her sense of belonging in class was associated with appropriate behaviour that supported her with her learning. This commitment was further reinforced through how the student identified herself in relation to participating in and with her class. Participation was identified through the phrases "I usually contribute in class," "put my hand up and answer questions," "I wasn't scared to do that," and "I got along with everyone." These phrases worked to determine in part her participation in her learning at school. However, this was not the case for other students. The discursive practices of a discourse were traced as determining student access to that discourse and the kinds of identities constructed. This access and its consequence for a student's identity can be found in Jasmine's account of her secondary school experience.

It was okay but the teachers did not really explain it that well to the class. Like the teacher that we had. Hardly anyone in our class understood what we were doing. We would ask them but, we just had one big textbook so we would have to go to the beginning of the textbook and reread how to do it and that. ... Yeah, but still got a lot of questions wrong. ... Hate it. ... Oh, because I didn't understand any of the questions and just wrote down what I thought it was. ... Just the person that was sitting next to me, but they didn't really know much more than me. I belonged in the way that no one else really understood anything that we were learning anyway. (Interview, Jasmine, Program Student)

Expressive modality is useful for understanding this student's version of reality further. In particular, the modal auxiliary verb, *would not*, and the intensifier, *just*, worked to identify the negative relations between the teacher and student, for example, minimal interactions and explanations about the mathematics to be learned. In doing so, the identity of the student as a mathematics learner was further reinforced in the phrases, "hate it," and "I did not understand," thus indicating participation on the margins of her class.

Conclusion

This paper has presented the discursive and one element, discourse, that shapes student participation and non-participation. Critical discourse theory has been articulated with a social theory of learning. Particular characteristics of this theory, that is, discursive practice, discourse and subject position, have been linked to identity, participation and non-participation in classrooms. This articulation serves as a framework for understanding the complexity of classroom interactions in mathematics classrooms. It also serves as the platform to further understand the discursive practices influential to participation and non-participation in and from such learning communities. Articulation refers to the bringing together of elements of both theories to examine discourse.

This articulation provides an effective means of understanding the relations of power how they are achieved through the discursive practices of mathematics as identified from students' interpretations of classroom events and practices. In doing so, it makes transparent the relations between discourse, discursive practice, and social structures. Thus, it enables a deep reading of the students' accounts. Here, students' spoken accounts are considered evidence of the construction of social identities and how social relationships are set up in classrooms. Through this approach, insights are gained into the generation and reproduction of the different social practices that have been institutionalised in settings such as primary classrooms.

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