7 CONCLUSION

This chapter reviews the central argument of the thesis, which highlights students' competence as Participants in their mathematics learning, and points to the potential that the study maintains for transforming mathematics education. In the first chapter, I described the origins of my motivation for conducting this study: how my experiences as a mathematics teacher led me to critically consider the established practices and discourses surrounding students and their learning, and especially the manner in which they directed my actions in the classroom. I described how my professional interventions, which sought to enhance students' participation, highlighted the need for a more rigorous study. In the second chapter, I detailed my embarkation on a search for a theory upon which to base this study, and established a theoretical grounding for the possibility that students could create their own mathematics knowledge. I established that shared epistemic agency is the quality that I wanted to emerge in my students, and identified the concepts of knowledge building and knowledge creation that would accompany this emergence, in order to give form to the kind of pedagogy that will enable this agency in a secondary school classroom. I synthesised six characteristics from the literature that substantiate my conceptualisation of shared epistemic agency. Researching existing transformative pedagogies suggested initial design principles, and revealed a gap in previous experimental designs which could be filled by an innovative pedagogy that would drive the student agency I sought. On the strength of this chapter, I realised the questions the study needed to answer were:

1. What are the indicators of shared epistemic agency in the mathematics classroom?
2. What sustains the emergence of shared epistemic agency in the mathematics classroom?

These two questions oriented the research towards describing the shared epistemic agency that was operational in my secondary school mathematics classroom in

England.

The following three chapters focused on answering these questions. The knowledge I gained from chapter 2 informed the pedagogic principles on which I based my design of the innovative pedagogy outlined in chapter 3. I put forward my justification for using a qualitative action research methodology to systematically identify the characteristics of the shared epistemic agency as they emerged amongst the Participants. This chapter on methodology presented my design for the pedagogy in terms of four-stage teaching cycles that allowed continuous adaptation to the pedagogy and two research cycles that allowed data collection and reflection to improve the next cycle. The chapter also discussed the measures I took to assure the quality of mathematics knowledge acquired by students, and the ability of the research to answer its questions: by my responses to reflection after each teaching cycle and after the first research cycle.

In Chapter 4, I introduced a method of analysis that, in combination with the research and pedagogy designs, forms one of my original contributions. I needed to find a systematic way of selecting from a huge quantity of video data. I developed the notion of an Episode of shared

epistemic agency (the unit of analysis) based on the six characteristics that I had synthesised from the literature. Chapter 5 developed a more nuanced characterisation of shared epistemic agency, and presented findings by analysing students' interactions. The findings of the study are summarised below.

Knowledge building

- Students can advance their individual and collective mathematics knowledge by epistemic interaction by which new knowledge is built in response to an identified or assumed unknowing.
- Students can take responsibility for their individual and collective knowledge advancement.
- During epistemic interaction, students seek to know from other students by asking epistemic questions, seeking affirmation, making requests, challenging knowledge, and articulating their unknowing. They explicate their mathematics knowledge by clarifying, affirming others' knowledge, telling, and explicating others' unknowing. They facilitate the learning of others by controlling the learning behaviour in the classroom, checking each other's learning, and managing the learning resources. The mutual relations that developed amongst participants were conducive for the advancement of mathematics knowledge.
- The students built new mathematics knowledge by appealing to procedural knowledge, a knowledgeable participant, conceptual

knowledge; or by a combination of two or all three of these appeals.

Positioning

- As students interact to advance their mathematics knowledge, they can be positioned flexibly as a learner, knower, or facilitator from moment to moment.
- The students can reflexively position themselves as a learner, knower, or facilitator; they can be interactionally positioned by others as a knower or facilitator; and can be institutionally positioned by the pedagogy as a facilitator.

Process authority

- Process authority emerges during epistemic interaction, and constitutes a blending of authority. This blending of authority arises from the mutual interdependency of the experiences and skills of the students and the teacher. Students controlled their dialogical and physical actions in the learning environment during epistemic interaction
- The student is an authority, and can influence the behaviour of other participants when in the learner position. The student is also knowledgeable in this position.

Epistemic authority

- Participation in a learning community is democratic, and proceeds without regard for the ability labels ascribed to students by the school. As students interacted to enact the innovative pedagogy,

their epistemic authority highlighted that mathematics knowledge was required for a participant to direct their agency towards Extension. Students enacted the pedagogy irrespective of the ability labels assigned to them by the school, and they took responsibility for their individual and collective knowledge advancement.

Finally, the innovative pedagogy that presumed the competence of its participants supported the emergence of shared epistemic agency.

Responding to the research question, in the sixth chapter, I reconceptualised shared epistemic agency from a set of discrete types of behaviour towards a more holistic view of student participation and community practice.

In the remainder of this chapter, I outline the potential contributions of this study, both to research and to educational practice in general. It is organised into four sections. In the first section I outline my contributions to the field of mathematics education, and how my contribution challenges current policy and practice. The second section discusses my contributions to research methodology, and in the third section I present the contribution this study makes to the theory of education. In the fourth section I discuss some limitations of the research and suggest avenues for further study.

7.1 A Contribution to the Field of Mathematics Education

In this section, I present my contribution to the field of mathematics education in two parts. In the first part, I present an alternative perspective of the Participant and Educator, and observe how these conceptualisations of the roles of student and teacher challenge current educational policy and practice. In the second part of this section, I present my innovative pedagogy that is purposeful for the emergence of the Participant in the Learning Community, and discuss how this Learning
Community presents a challenge to educational policy.

7.1.1 A Contribution – The Participant and The Educator

I present an alternative perspective on the student and the teacher in the mathematics classroom before the field of mathematics education. This study started with my desire to improve students' participation in their learning by breaking down the crystallised power-relations within the classroom that frame and limit students' participation in the secondary school classroom. Having now completed the study, I am now able to demonstrate that students can indeed transcend the confines of the conventional teacher-student roles and take charge of their learning. In doing so, they exhibit the power to change the existing notions of "student", "teacher", and "mathematics classroom". What emerged from this study is a transformative conceptualisation of the student as a Participant (see section 6.1.1), the classroom as a Learning Community (see section 6.1.2), and the teacher as an Educator (see section 6.3.1).

I identify the essential feature of the Participant in the Learning Community as their competence (see section 6.2.1). This Participant can be a learner, knower, or facilitator at any given moment in the interactions of the Learning Community as they seek to advance their knowledge and that of other Participants. Positioned as a learner, the Participant commands what they know and what they are yet to know. This command is the result of their reflexive positioning as a learner. A learner cannot be positioned as such by another Participant or by the discourse of schooling, but only by their own actions and reifications. One of the most significant insights from this study has been my claim that the Participant is an authority in this position

– not just because they are knowledgeable in their awareness of what they do not know, nor because they can control how they seek to extend their knowledge; rather, their authority is sustained by their ability to set in motion the actions and reifications on the part of their fellow Participants that lead to knowledge creation. The learner is productive because as they position themselves as learners, they position another Participant or cause another Participant to position themselves as a knower. Unlike the learner position, which is always reflexive, a Participant may either position themselves as a knower or be so positioned by another Participant. Taking up the position of a knower in response to the positioning of a learner, the Participant demonstrates the interdependence of the two positionings; they also further show they can be relational in the learning community, recognising and responding to the epistemic needs of other Participants. The knower has epistemic

authority in the Learning Community as they explicate their mathematics knowledge. However, I have shown that this Explication does not stupefy the learner, because, unlike in classrooms implementing the typical teacher-student relationship, in the Learning Community the learner and knower treat each other as being of equal intelligence; they see themselves in each other, having themselves taken up the positions of learner and knower that circulate amongst Participants. This positioning as knower and learner then forms the basis of a process of epistemic interaction (knowledge building) that leads to the creation of New Knowledge.

A Participant may position themselves as a facilitator, or may be so positioned by another Participant. Unlike other positionings, the Participants were also positioned institutionally by the design pedagogy as facilitators of learning. In this position, they exercised process authority in controlling how the learning was organised in the Learning Community. In this position, the Participants continuously negotiated process authority with other Participants, including myself. My own role as a participant and my authority were open to negotiation within the Learning Community, leading to a blending of authority that recognised our interdependence; it was negotiated lesson by lesson, moment by moment, and was not rigidly determined either by the design or by fiat.

Through negotiation, a practice emerges in which all Participants take control of the dialogical and physical interactions necessary for the advancement of mathematics knowledge; in this way, authority circulates amongst participants. This practice, in which Participants control their own

epistemic interactions, stands in contrast to the conventional practice, in which students sit in silence working independently, or in which they only briefly undertake group work orchestrated by teachers. The control that circulates amongst Participants lies in their production and management of spontaneous movements or dialogues that fulfil an immediate epistemic need.

In addition to my reconceptualization of the Participant, I contribute from my reflections (see section 6.3) the possibility of conceiving of the teacher as an

Educator. The Educator's role is to draw out the Participants' latent potential. The Educator recognises that Participants behave in unpredictable ways; thus, the rules and regulations that underpin conventional educational policy and practice are recognised as being ultimately provisional, and unable to account for differences in individuals and environments; the Educator, who does not rely on such conventions, is rather required to possess situational understanding, and consistently making contextual judgments in order to empower Participants to take responsibility for their own advancement. The development of the Participant, I discovered, is conditional on presence of the Educator, who constantly verifies their capabilities. In my position as an Educator, I participated as a learner, knower, and facilitator (see section 6.3.1), but assumed these positions in a manner different to that in which other Participants did so. As a facilitator, I made situational judgments of my actions and reifications at every moment to ensure that, while fulfilling my ethical role as a teacher – as a knower – I also validated the epistemic

authority of other Participants by refusing to exert my authority over theirs; most importantly, however, I positioned myself as a learner, and learnt to trust in Participants' competence as learners, knowers, and facilitators

I describe the Participant and the Educator as interdependent equal partners on an educational journey; each was knowing, each was learning, and each was facilitating the advancement of mathematics knowledge. The teacher brought their experiences, while the students brought their capacity to renew, revise, and transform mathematics learning. Contrary to the notion of mathematics learning as the presentation by the teacher of a fixed set of rules to be memorised and practiced by the student, I present a picture on which mathematics knowledge emerges within a Learning Community, in a manner that is unique to the subjectivities of the participants (see section 6.3.1.1), and which belongs to both the teacher and students as they blend their epistemic authority. Through my experience I believe it is possible to bring about a widespread reconceptualization of all students as Participants.

7.1.1.1 A Challenge to Educational Policy

The notion of the Participant challenges the dominant discourse of the subjects of education in the UK. I have characterised the Participant as competent and an authority as a learner, knower, and facilitator in the Learning Community. However, the dominant discourse of the learner used to describe the subjects of education is construed in terms of a deficit (see section 6.1.1.1.3). Educational policy contributes to the notion

of the student as being equated with “stultification’ (see section 6.1.1.2.2), as it presents the pupil as of lesser intelligence compared with the teacher, and as incapable of taking responsibility for directing their learning.

The National Curriculum for England Mathematics program of study, which uses the term “pupils” to describe the subjects of education, aims for pupils in England to become fluent in the fundamentals of mathematics, to reason mathematically by following a line of inquiry, to develop an argument, justification, or proof, and to solve problems (Department for Education, 2014). What I consider a missed opportunity is that the curriculum does not describe the desired behaviours of the pupils who are the subject of the document. A description of the pupil could influence the discourse in schools, or at least start a much-needed conversation about how those in education can nurture the pupil the policy desires for the UK.

In addition, policy undermines the importance of the role of the Educator as vital for the empowerment of the Participants, as demonstrated in this study. Rather, it is explicit in its demands for instituting the supreme authority of the teacher. My search of recent government documents identified one that focused on pupils' behaviours in schools; however, rather than assuming a sympathetic view of the pupil and their potential empowerment in their education, the policy was explicit in prescribing behaviour policies for schools, and explained the powers that members of staff have to discipline and to manage their behaviour both inside and outside of school (*Behaviour and Discipline in Schools*, 2016).

In contrast, the Scottish Government considers learners' desired behaviour in its curriculum for excellence (Curriculum for Excellence - A Statement for Practitioners from HM Chief Inspector of Education (August 2016), n.d.). The document explicitly uses the term “learners” instead of “pupil” to "signify a major change in relations between children and young people, their teachers and the curriculum" (Reeves, et al., 2013). In the document, a successful learner is described as a person "with enthusiasm and motivation for learning, determination to reach high standards of achievement, openness to new thinking and ideas, and able to: use technology for learning, think creatively and independently, learn independently and as part of a group, make reasoned evaluations, link and apply different kinds of learning in new situations" (Curriculum for Excellence - A Statement for Practitioners from HM Chief Inspector of Education (August 2016), n.d.). While the motivation for using the word “learner” in the document is to represent the student as actively involved in their learning, the document does not indicate how those in the profession of education can or ought to nurture this learner. Observing its detailed descriptions of the responsibilities of the teacher, I contend that educational policy in England and Scotland inadvertently contributes to a deficient view of the student, and, in this way, that it hinders the development of the competent student whose emergence the government nevertheless appears to desire in mathematics education.

This study started from a supposition of the competence of students to participate in all aspects of their learning. This supposition – that the students already possessed the agency that the study sought to produce

– informed the structure of the innovative pedagogy. Enacting this pedagogy successfully led to the emergence of the student as a multi-faceted Participant who is both competent and an authority in the Learning Community. Thus, my contribution to policy is the recommendation and imploration, supported by my research, that it presupposes the subject of education as competent. This presupposition could change the dominant discourse of the learner, pupil, student towards one that recognises their empowerment and agency. I hope to have shown that that this empowered learner can emerge, and that this emergence does in fact and improve mathematics learning.

7.1.1.2 A Challenge to Educational Practice

In presenting this Participant as Competent rather than incapable, I cast into question practices by which teachers take responsibility for the learning process, such as through the exposition of subject knowledge, classroom differentiation, and determining the role of questioning in the classroom.

In schools in England, the language of government policy positions the students as incapable of directing their learning by recommending questioning as a teaching strategy to develop pupils' "higher-order thinking skills" (Great Britain Department for Education and Skills, 2004, p. 3). Research shows that children as young as 2 years old exhibit these skills, and children of this age are attested as even asking a series of questions on a particular topic; they are able to build on the answers they receive to pursue other lines of inquiry, refine their ideas, and build up

their stock of information about the world (Harris, 2020; Wellman, 2020). They actively seek explanation and when dissatisfied with an answer, will repeat their original question, disagree with the response, or provide their explanation. In a familiar setting, they ask more questions. Children also learn from both the explanations they give to others and the explanations they receive (Wellman, 2020). However, from around 10 years old, children are no longer avid questioners (Kuhn et al., 2020). This decline could be because schools today seek conformity and instruction from children, rather than eliciting the autonomy that encourages them to ask questions.

In conventional pedagogies, teachers use questions to access students' knowledge. This use of questioning conforms with the discourse in which students are considered to be incapable and needing the teacher in order to learn, and in which the teacher is positioned as knowledgeable, gauging the extent to which the student can feed back what has been imparted to them; the students are positioned as performers, merely displaying their knowledge (Oyler, 1996b).

The GOV UK Education inspection framework: Overview of research (Ofsted, 2019,

p. 15) that oversees school inspection included, as part of the research that underpins their inspection framework, a section on effective questioning. While the section acknowledges the various sources of questions in class, including those delivered by student to teacher and student to student, there is both a lack of information on techniques for elicit more questioning from students, and an emphasis on teacher-directed questioning; these two factors direct schools away from their

focus on students' spontaneity and towards a policy of conformity to teachers' instruction. The Rosenshine principles of instruction (Rosenshine, 2012), emanating from Ofsted and used for teachers' continued professional development, states that "the most successful teachers spent more than half of the class time lecturing, demonstrating, and asking questions" (Rosenshine, 2012, p. 33). In addition, the structure of the conventional mathematics classroom that views as competent whomever gets the answer right or works fastest, can further position the student who questions as ignorant. In my experience as a teacher, this mitigation of students' spontaneous questioning has resulted in students shying away from asking questions in class; they do not what to appear "dumb" in front of their peers. In this study, Participants asked questions spontaneously as they continuously sought to extend their existing knowledge; questioning presented itself as an inherent reality of the classroom, in which competent students sought information. The conception of the student as incapable has infiltrated the discourse of education and impacted recommended strategies; while these strategies seem to act in order to improve the education of "incapable" students, they can, as in the case of questioning, arrest children's natural propensity to learn. The mathematics Program of Study (Department for Education, 2014) that aims to have pupils reason mathematically and apply their mathematics knowledge, needs students who are aware of their unknowing and seek to know. Students who are creative in extending their knowledge in adaptable ways interact with others to create knowledge and create a learning community wherein

everyone's knowledge is advanced. It is my contention that this student is in every classroom, in front of every teacher, ready to be empowered.

7.1.2 A Contribution – The Innovative Pedagogy

I contribute a pedagogy purposeful for the emergence of the Participant who is competent and an authority in a Learning Community. The pedagogy is a full-time everyday pedagogy that 14-to-15-year-olds can enact in a secondary school mathematics classroom in England. It is based on the knowledge creation metaphor that depicts learning as occurring when individuals collectively create New Knowledge in the form of conceptual artefacts. I refer to the pedagogy as innovative; this is because it sought to change the established teacher-student power relations, transform the mathematics learning environment by demonstrating the interdependence of authority, redefine learning as a community endeavour, and challenge the existing discourse that defines the practice of mathematics learning. The pedagogy demonstrated the mutual interdependence of the authority of teacher and student in its expectation that the students participate fully in the advancement of their mathematics knowledge. This expectation informed the pedagogy design, in which the student took on responsibilities for their learning that are usually the preserve of the teacher, such as selecting their mathematics topic, planning the learning, sharing this knowledge with their peers in the mathematics classroom, and reflecting on their actions and reification. Being allowed to take on these responsibilities, the Participant emerged as competent in directing their learning. The Educator emerged as necessary for developing the Participant and

validating this competence. The Educator contributed their experience, referred to as mathematics knowledge for teaching, and the Participants brought to the Learning Community the knowledge of their capacity to learn and the ways they can direct their learning and that of other Participants. The pedagogy demonstrated that authority in the classroom does not need to be imposed by the teacher; it demonstrates Benne's notion of anthropological authority (Benne, 1970) (see section 2.3.2.1) that focuses on negotiation and consent, and considers the relationship of authority in the learning environment to be flexible and fluid. This mutual interdependence of authority empowers the Participants, as it points to learning as co-participation; both the Participant and the Educator see Expertise in each other (as facilitators), continuously learn (as learners), and continuously seek to support each other (as knowers) to reach beyond their existing knowledge.

I have demonstrated through this study that students in a mathematics class in an English secondary school can interdependently control their classroom learning while raising their achievement in conventional assessments. This capacity corresponds to a monumental transformation, as it shows that mathematics learning need not and should not be based on the one-way conveyance of knowledge from the teacher to the students; instead, it demonstrates that learning occurs during both student-teacher and student-student epistemic interactions. The pedagogy that points to such co-participation transforms mathematics learning from an individual endeavour into a community endeavour. It substitutes the image of the individual student striving to

acquire (master/memorise through practice) mathematics knowledge for their benefit with the image of a community in which each individual student's knowledge is available to every other member of the classroom, and each student is accountable to the task of advancing their knowledge and that of their peers. This Learning Community sustains participation by its redefinition of competence. This redefinition of competence as valued participation in the community's practice of learning mathematics causes Participants to emerge that belong to the community and who are accountable to the advancement of the community knowledge.

The pedagogy that defines learning as a community endeavour wherein participation in epistemic interaction constitutes competence is essential in mathematics education, especially in light of the common continuation or desire to continue with Mathematics study beyond secondary education. In a Learning community where students' identity of belonging fosters accountability (see section 6.2.2) to the practice of learning mathematics, this sense of belonging can reduce exclusion from mathematics. Research has shown that identities contribute to exclusion in secondary school mathematics education; this is particularly the case of the low number of girls that continue with the study of mathematics beyond secondary education, regardless of their high performance at GCSE mathematics (Smith, 2014; Solomon, 2007). I argue that inclusion in mathematics is more decisive than ability when deciding upon participation in its learning, and call for a redefinition of what constitutes "success" and "failure" in mathematics classroom; I also argue for the need to shift focus away from the individual student and their personality

as the cause of their “failures” in mathematics, and towards how educators can address the endemic “failure to belong” (Boaler et al., 2000) to the community of mathematics.

7.1.2.1 The Learning Community as a Challenge to the Educational Policy of Mastery

The notion of mathematics mastery was brought to the fore in compulsory education in England following the publication of the Programme for International Student Assessment (PISA) rankings in 2012. A small group of high-performing East Asian countries consistently dominated the top of positions in these international “league tables”. This publication led to a move for England to emulate the teaching methods and approach to mathematics mastery of practiced in these Asian countries. Accordingly, after Shanghai ranked 1st out of 65 countries in the PISA 2012 mathematics rankings, the Teaching for Mastery (TfM) programme adopted by the

National Centre for Excellence in Teaching Mathematics in the UK was influenced by Shanghai's mathematics teaching approach (Boylan, 2019). As a secondary school mathematics teacher, I have noticed that the implementation of this programme is no longer a government priority, and this could be due either to its impact on learning progress being of negligible effect (Demack et al., 2017) or the difficulty in its enactment by teachers; the discourse is ambiguous (C. R. Morgan, 2017).

The notion of "mastery", either in the discourse of the students' "learning for mastery" or of the teachers' "teaching for mastery" (Boylan, 2017), originates with the idea that a student can simply learn all of a subject's content and store it in their mind. This idea is conceptually obsolete in this age in which mathematics knowledge is advancing and diversifying at a pace with which learners could not hope to keep up. In practice, the mathematics mastery programme aims to teach individual students the curriculum contents up to a certain standard, with periodic assessments to measure competence. Competence becomes a measure of what is in their minds; individual students focus on their knowledge and acquire as much as possible. I question whether it is realistic or desirable to expect individual students to learn and know everything in a subject's curriculum, as is the current expectation. Learning occurs through interactions; (Bereiter, 2002; Bereiter & Scardamalia, 2011; Moss & Beatty, 2011); other people's knowledge helps clarify and improve what one knows, as with mathematicians in the professional community (Bereiter, 2002). A deep constructivist approach posits that schools must acculturate students into the real world of professionals, wherein knowledge creation occurs as one takes someone else's knowledge further through active epistemic interaction, not individual mastery. In this sense, mastery discourse contradicts the evidence of students' creative and innovative abilities to problem solve and reason mathematically. If students do not learn to problem solve and reason authentically in classroom activities, where they can seek to solve their mathematics problems and support in the solution of others, it would be unreasonable for educational policy to expect

students to develop these skills. This study proposes that as students actively participate in what matters, such as the Participants of my mathematics class participated in learning mathematics as competent mathematicians, they built on each other's knowledge, supported each other's learning, and collectively made progress. I contribute the notion of a pedagogy that creates a Learning Community as essential to develop the student necessary for success in mathematics education and beyond school.

7.1.2.2 The Pedagogy as a Challenge to Educational Practice of Ability Differentiation

The view of Participants as having the capacity to advance their collective knowledge through enacting the pedagogy stands in opposition to the discourse of ability prevalent in UK secondary schools. The basis of this prevalent discourse is the ideology according to which students have inherent, fixed, context-independent cognitive abilities (Oakes et al., 1997) over which the teacher has no control. In this discourse, assessments and ability settings place students on an ability spectrum in mathematics classrooms (see 1.1.3.1). Teachers consequently view students as “able” at one end of the spectrum, as of middle ability, and at the other, as of “low ability”. Most UK schools, as reported by (OECD, 2013), teach 95% of 15-year-old students in subject-specific ability groups.

However, labels or the ideology of ability do not in themselves reduce attainment in students. It is teachers’ belief in the labels and the ideology

that reduces attainment (Hallam & Ireson, 2003; Marks, 2016), altering teachers' behaviours towards the students, for example, through their interactions with and expectations of the students. The discourse of ability also limits the mathematics made accessible to the students (cf. Morgan, 2013; Smith & Morgan, 2016).

While some research shows that positioning students by means of these ability labels or other differences can lead to low student confidence at both ends of the spectrum, especially in students positioned as of "lower ability" (cf. Boaler et al., 2000; Snell & Lefstein, 2018), other Educators believe that differential instruction holds positive benefits (Konstantinou-Katzi et al., 2013) to students. The rationale is that "students learn best when their teachers effectively address the variance in students' readiness levels, interests, and learning profile preferences" (Tomlinson, 2005, p. 263). While addressing the variance in readiness levels, students' interests, and learning profile preference sounds laudable, if it can at all be achieved in a whole class setting, it calls for the teacher to subjectively decide what mathematics is made available to each particular student, thereby limiting the mathematics to which some students are exposed. In my experience, these decisions are based on students' social behaviours or performance in previous assessments, both of which are not accurate indicators of an individual's ability to learn something. Objects of knowledge that have not yet been encountered offer a new opportunity for individuals to engage with them, and individuals should always have such opportunities, rather than being limited to what a teacher allows them to access.

In designing the pedagogy, what I took from my experience were the beliefs that the student has the competence to make decisions about their learning and that the proper purpose of schools is to verify this competence. I did not consider ability; I had learnt from a prior experience of going wrong in my expectations of a student (see section 1.1.3.1) that any notion that places students in a knowledge hierarchy, be it a criterion of differentiation or of ability, can be unfair, and that "It is ignorance of this 'knowledge of inequality' that is supposed to prepare the way to reduce inequality" (Bingham et al., 2010, p. 4). The outcomes of this study confirm that, without any reference whatsoever to presumed ability labels, students can democratically and competently take responsibility for their mathematics knowledge advancement.

I do not naïvely deny that some students have barriers that prevent their learning from easily progressing. My point is rather that as an Educator, I should not start from a presumption of the abilities of all students based on an ability spectrum which defines how I behave towards them or what knowledge I make accessible to them. Instead, I should presume that *most* students can learn and make sense of knowledge. The design of the pedagogy and the relations within the learning community can make a difference to how students relate to mathematics.

7.1.2.3 The Pedagogy as Empowerment

The Pedagogy of Trust that presupposes competence (see section 6.3.2), was purposeful for the emergence of the Participant and the emergence of

the Learning Community. I contend that this emergence can be construed as a process of empowerment. The empowerment lies in the development of a democratic community and the relationships within it (see section 2.2.2.5), and in the power relations (see section 2.2.2.6) the Participants exercised in enacting the innovative pedagogy – hence, resisting and transforming the prevailing discourse of a conventional mathematics classroom.

Participation in the Learning Community was democratic and productive of mathematics knowledge (see section 6.1.2). The four stages of the innovative pedagogy specified what the students were expected to do (see section 3.1.1). However, to fulfil the principles that underpinned the innovative pedagogy (see section 2.4.3), that required the students to take responsibility, the pedagogy did not specify *how* it was to be enacted neither did it specify the *student behaviours* that were required for its enactment. This lack of specification was empowering as it gave the students' the freedom to bring their authentic selves to the enactment and to express their uniqueness. That the students could bring their authentic selves to the learning of mathematics was a validation of their intrinsic worth and competence in the act of learning mathematics (Macmurray, 1950). This empowered student emerged as a Participant that participated more democratically in the Learning Community. Participants' freedom of expression and freedom of behaviour (see section 5.2.2.2), the relationships of trust (see section 5.1.2.4), equality of participation (see section 5.2.3.2) and responsibility for each other's

knowledge advancement (see section 5.2.3.3) were evidence of the democratic community.

The Learning Community was not forced into existence, but was a consequence of Partcipant's freedom and it points to a pedagogy that empowered students to became authors of their own world (Ellsworth, 1990, p. 309).

Participation in the Learning Community was interactive and productive of mathematics knowledge. As the Participants interacted with each other, power relations were at play that structured their actions and reifications in the Learning Community (Foucault, 1978). In taking responsibility for the circulation of mathematics knowledge in the Learning Community, the Participants were no longer only subject to the thoughts and actions of the teacher. As vehicles of power, they could control their own actions and reifications and could determine how to apply their will towards the process of the community's mathematics knowledge advancement. That the actions and reifications of each Participant acts upon the actions and reifications of others in the Learning Community; as they positioned and were positioned by each other (see section 6.1.1), negotiated authority (see section

6.1.1.3.2), and defined competence and accountability (see section 6.2), is evidence of their productive relationships of power (Foucault, 1982). Ultimately, the Participant in the Learning Community transformed the view of the students from a dependent, constrained and passive receptor of mathematics knowledge to a Participant, who can take responsibility

for what they know and don't know and acting on this awareness, take control for their process of learning mathematics as a community.

7.2 A Contribution to Theory

The construct of shared epistemic agency originated from a study undertaken in the context of undergraduate collaboration (Damşa et al., 2010). In the outcome of this research, agency was defined as the "capacity that enables individuals, groups or collectives to make appropriate judgments, to make plans and to pursue these through purposeful action, in order to achieve the construction of knowledge" (Damşa, 2014, p. 446); the study presented an overview of epistemic and regulatory actions that indicate this construct. My research provides an opportunity to observe the interaction of secondary school students to develop its own derivative conceptualisation in this context.

In light of my wider reading, I synthesised six characteristics of shared epistemic agency that shaped my analytic framework. Through my empirical actions, I have refined, operationalised, and made the construct relevant to a secondary school classroom. I offer these contributions to theory.

7.2.1 Shared Epistemic Agency is a Manifestation of Who the Participants

Become

I have transitioned, in the course of this research, from seeing shared epistemic agency as a set of discrete types of behaviour to a more holistic view of student participation and community practice that involved 14-to-15-year-old students and their teacher as they enacted an innovative pedagogy for learning mathematics over one year. I have shown in chapter 6 that one of the themes that emerged from the study's findings was a new conceptualisation of the student as a Participant. This Participant emerged as distinct from the conventional notion of student with which my class started at the beginning of the academic year – suggesting that the emergence of shared epistemic agency changed the mathematics students into Participants, and myself as the teacher into an Educator.

This becoming can be explained in terms of Wenger's (1998) discussion of identity. He suggests that our identity is a product of our lived experiences of participation in specific communities; he describes it as a "layering of events of participation and reification by which our experience and its social interpretation inform each other" (p. 151). As the Participants participated in enacting the pedagogy as learners, knowers, and facilitators, and as their relations with other Participants reified their competence, they began to see competence in themselves, making them accountable to the practice. This accountability drives further competent participation that other Participants reify; this reciprocal, iterative process of participation, layered over time, develops students' identities into those

of mathematics Participants. This identity is flexible; it is constantly being negotiated through competent (or non-competent) participation.

An alternative way of conceptualising this change is offered by the positioning theory of Davies & Harré (1990). This theory recognises how discursive practices are directed, how individuals are positioned, the context of these practices, and how these positions affect the individual. Who we become manifests in social interaction through how we are positioned or how we position ourselves. Once a Participant takes up an available position, they see the world from the vantage point of that position and in terms of the discourses and behaviours directed towards them due to the position. Applied to the findings of this study, the flexible positionings are a result of Participants' interaction. This interaction constitutes and reconstitutes the Learning Community and the Participants that reify the various positions of learner, knower, and facilitator. Therefore, who a Participant becomes shifts in line with the positions they take up in the practice. As Participants are positioned as learners, knowers, and facilitators repeatedly, they begin to clearly see themselves as learners, knowers, and facilitators in these moments. Thus, mutually-inquiring agents in an epistemic community becomes who they are.

Both Wenger's description of identity and Davies & Harré's positioning theory are consistent with each other, and germane to the purpose of describing the becoming of the Participant. While the emphasis is not on the equality of positions, Wenger focuses on how participation in the practice of a community can lead to a change in individuals' identity and

who they see themselves to be; at the same time, the explanation presented by positioning theory points to the discourse practices of the community (this includes how it defines and reifies competence) that open up positions for individuals.

This contribution extends the original construct of shared epistemic agency to include the continuous and spontaneous interactions that take place in a secondary school classroom enacting a knowledge creation pedagogy, in a contrast, Damşa et al.'s construct, which was based on the collaboration that occurs during specific group activities. I put forward terms that indicate this distinction between the two constructs of shared epistemic agency: collaboration and interaction. I propose that Damşa's construct, which is observable in the context of group collaborations to produce a knowledge object, be referred to as epistemic agency through collaboration. On the other hand, this research has identified a different kind of shared epistemic agency that applies within a secondary school context wherein students are engaged in spontaneous interaction to create New Knowledge. I propose that the construct identified by this research should be referred to as "shared epistemic agency through interaction".

7.2.2 Shared Epistemic Agency is the Practice of a Type of Learning Community

When applied to a secondary classroom, shared epistemic agency through interaction suggests a specific type of Learning Community. This

Learning Community is not fully described by the construct of communities of practice I presented in chapter 2, but goes beyond them: it suggests a Learning Community that is both interactive and democratic, as described in chapter 6. While Wenger's community of practice could be extended to render it democratically interactive, my stipulations are not specific requirements of a community of practice.

Interactivity is more than the Participants' spontaneous and continuous actions and reifications, which are the bases of epistemic interactions and knowledge creation. The interactivity also needs to include the idea of freedom – the freedom of participation. This freedom of participation recognises the capacity of Participants to make decisions about how they should act in the classroom for knowledge creation, and, equally, the freedom of the teacher to make situational decisions regarding how to participate in the learning community. This idea of freedom is not freedom from societal oppression (cf. Freire, 1970), nor the emancipation of the individual from social inequalities (Rancière, 1991). It acknowledges that unique individuals with unique experiences, skills, and personalities, and diverse ways of knowing exist within each Learning Community. Hence, within each Learning Community, a different practice should emerge of its own accord. The idea of freedom that I posit as necessary for the Learning Community is the freedom from the unilateral authority of the schoolmaster, and requires a blending, and freedom of the teacher from the authority of the conventional and normative discourse of pedagogy, allowing situational judgments.

The Learning Community suggestive of shared epistemic agency through interaction also requires that participation be democratic. In this study, democratic participation resulted from a recognition of the interdependent capabilities of Participants rather than of mathematics ability measured in terms of a hierarchy of performance.

Research into how to sustain student agency has focused on developing a classroom culture that can sustain student interaction. Some research has explored more open-ended learning designs to support student inquiry (Zhang et al., 2018), while others have focused on the use of technology such as “knowledge forum” (Scardamalia & Bereiter, 2014), an online platform where students can collective discuss ideas, AsCRA, a reflective assessment tool (Yang, Chen, et al., 2020), and ITM, a time-line based inquiry structuring platform (Zhang et al., 2018) to develop a community culture in the classroom that sustains and develops students’ agency over a period of time. I contribute to this research, demonstrating that shared epistemic agency through interaction can be sustained by a Learning Community in which freedom of participation and democratic participation are maintained, and which does not require the development of special technologies.

7.3 A Contribution as a Teacher-Researcher

Having completed this study, I advocate action research as a methodology suitable for teacher professionals to undertake in order to transform their classroom practice and the educational profession at

large. As noted in chapter 1, I am a mathematics teacher who recognised how the conventional mathematics pedagogy I employed excluded students from bringing their agency and capacity for independent thinking to mathematics learning. This limited their capacity to solve mathematics problems logically. I sought to improve my students' participation in their learning and hence their relationship with mathematics.

In the same vein, as a secondary school teacher, I felt excluded from contributing my personal knowledge (McNiff, 2017), gained from years of developing strategies to improve student's learning, to the profession. Personal knowledge is often tacit, subjective, and intuitive, coming from contact with the world. It can be difficult to articulate and rationalise; sometimes, we just know what we know. However, this study is testament to the fact that, just as the Participants in this classroom as an interactive community demonstrated the capacity to explicate others' tacit knowledge (see section 6.1.2.1.1), a culture of action research amidst a community of professionals could enable teachers turn their personal knowledge into knowledge that can be shared.

I am of the opinion that the teacher in the classroom has the agency and competence to transform the conventional pedagogy, and I believe that this is already happening in classrooms such as mine. I present action research as a methodology that can enable teachers to make knowledge claims and present the adaptations they make to their practice as theoretical interventions. Sharing what we know can transform our practice and how our young people learn from within the educational profession, without relying on policy and external research.

Being a teacher-researcher necessitated the selection of a methodology that would allow me to study the transformation of my existing practice while still fulfilling my ethical responsibility as a mathematics teacher. My contribution is a particular action research methodology that is dynamic, as it allows for change and improvement; participatory, as it values the contributions of the Participants; and empowering and authentic (the inverse of a top-down approach to change), as it legitimises the combined contributions of my practice and my research towards a knowledge claim.

7.3.1 A Particular Action Research Methodology

Action research has been described as a meta-methodology (Attwater, 2014), allowing flexibility in its cyclical oscillation between the action and reflection. This flexibility allowed me to design a methodology wherein I could use my personal knowledge or trial and error to implement changes to the classroom practice within the action research process.

My research design, which repeats itself within each action research cycle, consists of one or more teaching cycles (TC) (see Figure 7.1). It can be thought of as cycles within cycles.

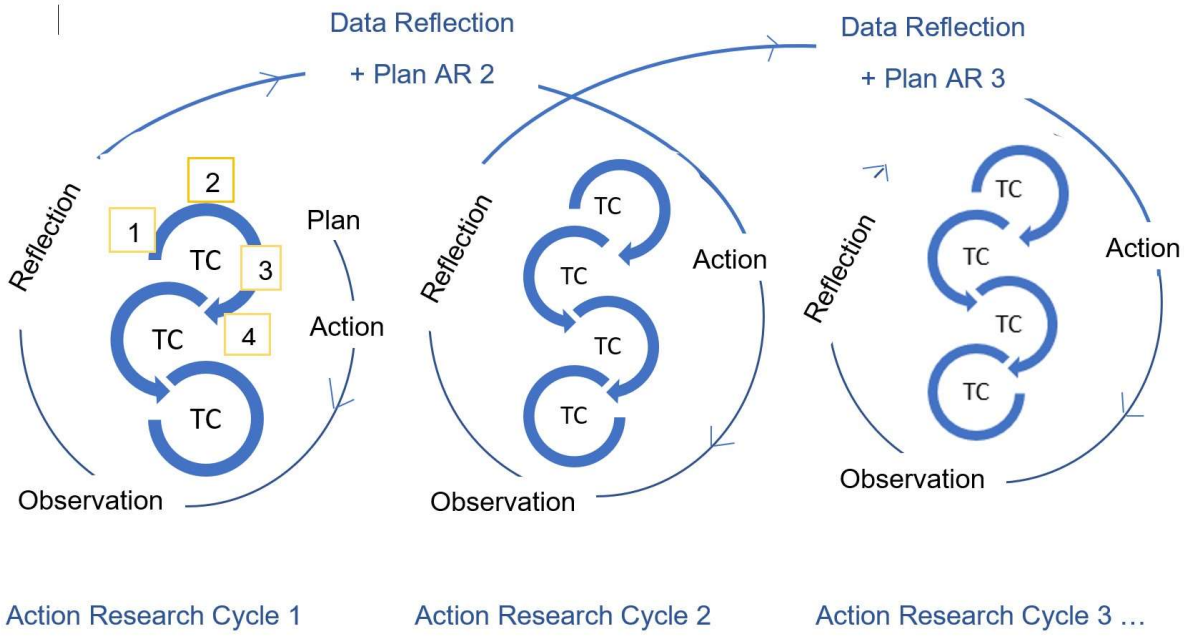

Figure 7.1 – My action research cycles inclusive of teaching cycles

Within each action research cycle, I nested miniature teaching cycles that were structured by the typical action research spiral of iteration and improvement. Each teaching cycle was designed based around the change I wanted to make in my classroom. The teaching cycle allowed me to (1) Plan, (2) Act, (3) Observe, and (4) Reflect on what I observed (see section 3.2.2). The duration of each teaching cycle is flexible in this type of study. In the case of this study, the duration of each teaching cycle was based around the requirement that each student have a turn as a teacher participant. However, in principle this structure can be adapted to fit the aims of innumerable types of research. For example, the teaching cycles could be weekly or could coincide with a mathematics topic or teaching module.

The final teaching cycle in each action research cycle was the data collection cycle. The first four stages of this teaching cycle aligned with the stages of the research cycle (see section 3.3). In the fifth stage, all

data collected was reflected on, and any changes to the next research cycle or to the pedagogy were planned. Following the reflection stage of each teaching cycle, the participants and I acted to implement changes to the pedagogy for the next teaching cycle. The changes were based on the tacit knowledge I had of teaching, the participants' responses and explicit input, our context, and the aims of the study. Having a number of teaching cycles within each action research cycle allowed me employ such knowledge and make changes to the subsequent teaching cycles. In this way, I was a researcher adapting to the demands of the setting of my study, but also a teacher who could still act to fulfil my responsibility and ensure that the pedagogy served my students.

Working in a school environment is open to uncertainties from many directions.

These includes structural uncertainties such as the length of teaching time needed for a topic, school closure days, assessments, illnesses, interruptions that can alter planned schedules, and uncertainty caused by undesired outcomes of plans. In the complex classroom environment, in which there are 18 co-participants whose agency impacts situations, it is not easy to predict and judge the outcomes of events. However, the methodology, arranging the research in spirals of self-contained teaching cycles, allowed for adaptation to parts of the research and pedagogical designs. I could make changes to best meet my ethical responsibilities as a professional while also answering the research questions. In a complex environment such as a classroom, it is often difficult to foresee the impact of actions until one engages with them; in addition, "you cannot understand a system until you try to change it" (Schein, 1996). Following Lewin (1946), Schein argued that it was a fundamental error

to think that the notion of a diagnosis can be separated from that of an intervention. It is by engaging with the situation that one can determine what works and what does not. Having teaching cycles within each action research cycle, I could evaluate what worked in our classroom context and what did not, again and again, within each teaching cycle, learning and preparing for future stages as the innovative pedagogy was enacted.

The flexible nature of the methodology was beneficial to myself, the participants, and to the research outcomes, because I was able to be part of the research. I was not an outsider studying the setting or participants, such as in a phenomenological approach wherein the researcher seeks to thoroughly capture and study another's “lived experience” (Patton, 2015, p. 115). I was researching my own practice and bringing my experiences as an intelligent professional to the research. I could initiate changes during the research process and reflect on their impact; the possibility of effecting change through reflection was always reserved. Elliott (Elliott, 2011) referred to this type of reflection as “reflexive”, and considers it to be an essential part of the practical science of any professional (see section 3.2.1). This methodology allowed me to be reflexive, as the reflection was highly personal. As I reckoned with my own place in the research, the assumptions, experiences, and beliefs that underpinned my practice, along with my practical attitudes towards my profession, became open to reconstruction, and revealed possibilities for further intelligent action as a professional. The flexible nature of the methodology enabled me to improve my day-to-day practice as a professional and, ultimately, to

make my systematic inquiry public (Stenhouse, 1981) to the field of mathematics education in the form of this project.

7.3.2 An Authentic and Empowering Methodology

The methodology can be captured by the designation “authentic methodology”, as I designed it ad-hoc to meet the research purpose; I chose to insert the uniqueness of this study and my creativity within the existing framework of my professional relations and within the research norms of academia (Kreber, 2011; Taylor, 2018). Bound by a professional obligation to do what is right for students, and the courage to seek to change what needed to be changed, this methodology legitimised my actions. I put my courage at the disposal of my students, availing us of the possibility of immediate benefit to the current practice rather than waiting for the research to be completed to effect change.

As opposed to positivist methodologies, wherein theoretical protocols dictate methods for designing the research and collecting and analysing data, in the action research methodology that legitimised my experience, my increasing knowledge had a recursive effect on my experience, which positively impacted the research. My readings of the literature enabled me to understand the history and original motivations of my practice, and therefore to consider alternative possibilities and approaches. Over the single year it took to complete the data collection, this knowledge impacted the thought process that underpinned my actions in the classroom and the research. I became both a better professional and a better researcher; as my knowledge and experience improved, I was able

to design the data analysis to fit the research design that had changed in the course of the research. The unit of analysis that I developed, the Episode (see section 4.1), set my research apart from that of Damşa et al., in which actions were the unit of analysis.

This difference was due to context; Damşa et al. studied collaboration between undergraduates, while I studied my secondary school students' interactions (see section 6.1.2.1.1). In Damşa's case-study approach (Yin, 2014), she sought to observe and analyse the behaviours of groups of undergraduates as they collaborated to produce a knowledge object; in this research, on the other hand, the context was more flexible (see section 7.2.1), and the students and I were continuously interacting in different groupings towards the production of New Knowledge. In addition, as we engaged in enacting an innovative pedagogy that was changing who we were, our classroom actions also changed.

Interactions in the classroom went beyond our individual actions, and it was the products of our intersubjective experiences that impacted the research and required analysis. As I see it, these contrasts highlight the fact that my original approach has particularly much to offer to other researchers concerned with epistemic agency.

Finally, I note that my research methodology, which legitimised my authenticity as a continuously evolving professional with a developing understanding and discerning application of theory, is both professionally and personally empowering. Indeed, my knowledge continues to grow in the wake of my discoveries; I have personally moved from seeing shared epistemic agency through interaction in terms of a set of discrete types of

behaviour towards a more holistic view of student participation and community practice – for example, I am determined, in future practice and theoretical interventions, to go beyond thinking of the Episode as the unit of analysis, preferring an analytical method better suited to this change in commitments.

7.3.2.1 A Participatory Methodology

The methodology that legitimised my experiences also gave a voice to the 18 Participants of my classroom, and, by its advocacy, to students at large. As they enacted the innovative pedagogy, my students made it meaningful and purposeful for them. To make it meaningful and purposeful for mathematics learning, they adapted their performance, contributing to the adaptation of other Participants' performance; cycle after cycle, their participation spoke through the chapters of this study. My students' voices, hence, their participation, came through in the dialogical and physical communications and reifications they made every day throughout the academic year. Their participation is woven into the field notes, the video recordings, and the transcripts of Episodes. In this way, they too were included in the transformation of how they (and hopefully others) learn mathematics in their classroom.

Researchers such as Schon, 2008; Stenhouse, 1981 have canonically called upon teaching professionals to conduct research to improve and change their practices (see section 3.2.1). Engaging in research is even more crucial in mathematics education if students are expected to be fluent in the fundamentals of mathematics, reason mathematically by

following a line of inquiry, develop an argument, justification, or proof, and solve problems. Mathematics teachers need to adopt an alternative to the conventional pedagogy that is typical across England (see section 2.3.1) to promote the emergence and sustenance of problem-solving and agency in the mathematics classroom (Boaler & Greeno, 2000; Wright, 2021). However, it would be especially difficult to bring about this change in mathematics pedagogy if teachers themselves are not engaged in research to effect change. Change to the classroom's day-to-day practices comes from a teacher's belief that such change is needed, and their ownership in implementing this change (Beck & Young, 2005). Moreover, a top-down approach from policy or academia may make it difficult for changes to be enacted and or sustained in the long term (Ball, 2003, 2012). A lack of ownership of change could explain why conventional school mathematics has remained largely the same in the UK, despite the seemingly numerous reforms to the national curriculum (C. Morgan, 2010). Extending the argument that teachers as professionals need to be involved in changes to their profession if the change is to be impactful, students as subjects of the change also need to be involved, and even direct the change, as it is ultimately, they who will benefit.

As a teacher-researcher, I present a methodology that positions the teacher as an intelligent professional, that allows them to bring their authentic selves to the research, and that recognises the necessity of hearing the voices of the students if the outcome of the research (both in academic and professional contexts) is to be transformative for the

mathematics student. My contribution is a particular action research that separates the cycles of the pedagogy from the research cycles so that changes to the pedagogy can be implemented as an action immediately while still carrying out the research.

7.4 Limitations and Suggestions for Future Research

This study has explored how shared epistemic agency through interaction can emerge in a secondary school Learning Community driven by a purposeful pedagogy built on the assumption of the interdependent competence of the Participants. This definition builds on and advances Damşa et al.'s (2010) descriptive concept of SEA through collaboration.

The data collection and analyses were focused primarily on the interactions that occurred as Participants enacted the Share stage of the pedagogy in the mathematics classroom. The other stages of the pedagogy were not analysed in the same manner. This was a consequence of the limited data collection methods that were available for making this stage visible, and the data is as such not reflective of all the learning that occurred as the Participants enacted other stages of the pedagogy. Additionally, the recordings were only of three teaching cycles. I opted to record every other teaching cycle (excluding the first) – the third, fifth, and seventh. I also made assumptions about the collaborative stage of the pedagogy, that is, the Plan stage, believing that since the teaching Participants produced a conceptual artefact, and that its later

sharing represented shared epistemic agency through interaction, their collaboration could also be said to represent shared epistemic agency through collaboration. This is conjecture on my part, and it is possible that, if more comprehensive data on collaboration during the Plan stage had been collected and analysed, different findings than those of shared epistemic agency through collaboration may have been produced.

I did not analyse the learning that occurred through reflection at the end of each teaching cycle; neither did I analyse how this learning influenced the Participants; nor did I look at changes in the Participants of the learning community. I acknowledge that there is much more to be learnt from this study, and further opportunities for improving education for young people and making them feel that they are indeed good at maths.

In chapter 3 I highlighted how the camera positionings (see section 3.4.4.1.1) and my student interview techniques (see section 3.4.4.2) limited the data collection. The position of the camera during teaching cycle 7 limited the number of recordings made available for analysis. Further recordings from this teaching cycle in a different classroom setting may have provided evidence of how different environments impact shared epistemic agency through interaction. I excluded the student interviews from systematic review, and limited my analysis of data to what was observable on the camera recordings of the Share stage (see section 3.4.5.1.1). Student interviews at the end of the action research cycles, when Participants would be able to reflect on their entire enactment of the pedagogy, may have further supported the findings of this study, or evidenced other findings.

An area of further research that I put forward is the link between institutional authority and student's authority. In my experience, discipline in schools is imposed on students by teachers and by the institution of schooling's view of how students should behave to learn. In this research I found that in giving student authority, there was a reduced need for the conventional view of discipline in the classroom. In taking process authority, students negotiated classroom behaviour. Anecdotally I believe that giving the students process authority, reduced undesirable classroom behaviour. Or it could be that there is a divergence in what students view as undesirable behaviour in the classroom compared with teacher'++s view. Therefore, there is scope for further research into a revised view of discipline in schools.

An area for further thought is how I can be a true participant if I am not learning what the students are learning, can I really establish equity if they are seeking to gain their mathematics qualifications and I am in service to this?

Nevertheless, and in spite of the limitations, further research or thought, by the undertaking of this study, I have shown as a counterexample what is possible in a secondary school mathematics classroom in which authority circulates amongst the participants. The student emerges as a competent individual who forms a community with other students who, through their agency, advance their collective mathematics knowledge. It presents the mathematics classroom as a democratic community in which

both the teacher and the students can learn, know, and facilitate each other's education, with each bringing their unique skills and experiences in a blending of authority.

This has implications for how the students in the study viewed the field of mathematics education and education in general. The conventional view of the teacher as a necessary authority is fundamental to the discourse of schooling, and reflects the beliefs that most potently informs government policy, professional development, and teacher training. Against this, the views of the student and their competence advanced in this study relate a call for reforming of the pedagogy and the institutional ways in which teachers interact with students in classrooms and schools. It also raises the question of what further potential may be possessed by our students, waiting to be drawn out.

To answer this question requires other teacher-researchers to carry out similar research in their classrooms; I believe I have shown that it is more than possible to transform the pedagogy within the structures of the mathematics curriculum in a secondary school. While the uniqueness and narrow focus of this study may lead to its non-replicability, I believe that within the body of evidence that I present, sympathetic teachers and researchers can decipher the principles of my pedagogy and adapt them to their contexts, bringing about a comparable pedagogy of trust designed to be enacted by students who already own the qualities it aims to produce – a pedagogy that, in an appropriately egalitarian manner, believes in the competence of students, allowing this competence to emerge in its own way. Thus, I call on teachers to become researchers, as I believe that the

process of applying the principles of this study to further research areas will provide yet more evidence of the immeasurable competence of the young people we teach.

My hope is that “not only scholars of teaching but also those whose learning experiences they intend to support, would seek to renew our common world” (Kreber, 2011, p. 866). To this end I hope that this study contributes a kind of answer to the question that educators persistently ask of themselves: “What works, what is and what is possible?” (Hutchings, 2000).