

## Is Streaming an Equitable Practice? Students' Experiences of Streaming in the Middle Years of Schooling

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Streaming is a well used practice in mathematics classrooms premised on a pragmatic belief that it supports the teaching of mathematics. This paper draws on interview data from Year 9 and 10 students who discuss their experiences in streamed classrooms. The students' responses indicate that streaming enhances the learning for the high stream students and restrains the learning of students in lower streams. It is proposed that streaming in mathematics classrooms has the potential to widen the gap between groups of learners rather than to offer more inclusive learning environments that meet the needs of the learners.

Common to many mathematics classrooms is the practice of streaming where students of perceived similar ability are grouped together. As a practice, streaming has been shown to be widely supported by teachers (Chen & Goldring, 1994). The explicit intention of this practice is that students can be exposed to content that matches their levels of understanding and, as a consequence, appropriate learning and scaffolding can be developed to move the students on to greater levels of understanding and competence (Slavin, 1990). Furthermore, some teachers also argue that the hierarchical nature of mathematics makes it most amenable to streaming (Ruthven, 1987). In some cases, such as the UK, streaming (or "setting" as it is known in that context) is mandated and controlled by state systems (Boaler, 1997b). In other cases, such as Australia and New Zealand, streaming is more insidious and can be implemented at the school level or classroom level. In the case of these countries, streaming becomes more apparent at the secondary school level, whereas at the primary level it is in a more ad hoc fashion. Mathematics appears to be the subject most prone to streaming, often with other subject areas remaining as mixed ability. In both contexts, the practice of grouping students into three broad bands appears to be a common practice whereby students are grouped in classes where high achieving students are exposed to extension activities, middle band students receive the standard curriculum and lower band students receive remediated or low level work. Where students have significant learning difficulties they are often withdrawn from classes and placed into special groups. However, the practice of streaming, in whatever form, is conducted by the individual schools or teachers, rather than from a system's directive.

Part of the rationale for grouping students according to ability is that it makes teaching more effective – in terms of outcomes for students since the curriculum can be better targeted to their levels of understanding or performance but also in terms of making planning and delivery more streamlined for teachers. Lessons can be conducted at a pace that suits the students. In studying elementary schools, (Mason & Good, 1996) claim that the more diverse classes made teaching more complex and challenging for the teachers. Underpinning the justification for streaming is a belief in the underlying notion of an innate ability whereby the students' abilities in mathematics is the major reason for the performance in mathematics (Lorenz, 1982).

In spite of the widespread use of streaming in schools, there appears to be little support for the practice of streaming. On one hand, studies on streaming indicate that placement of students into ability groups widens the gap between the groups beyond what would

normally be expected (Slavin, 1990). Gamoran (1993) and Boaler (1997b) argue that the nature and quality of interactions in high and low streamed classes are fundamentally different. Furthermore, the literature on mixed groupings shows that there are qualitatively different and richer experiences where mixed groupings are used.

### Ability Grouping as a Practice

In the UK there has been a strong support of streaming (or setting) where it had selective schooling until the recent past when challenges were made to the elitism of the high ability schools. In more recent times, practices have seen setting as a practice within schools through mandated practices set by Government. In their comprehensive review of ability grouping literature, Ireson and Hallam (1999) claim that there is no conclusive evidence to support or dispute the value of streaming in increasing academic achievement.

In a large-scale study of American youth, it was found that ability grouping helped the advanced, harmed the students in the low streams and overall, had a negligible effect (Hoffer, 1992). In her study of middle school mathematics classes, Burkes (1994) noted that students from the high ability classes were more likely to view mathematics positively, engage in appropriate behaviour and to undertake homework than their peers in middle or lower streams. This enabled the students to perform better in mathematics.

The most comprehensive study of ability grouping in recent times has been that of Boaler. In her intensive study of two UK schools, Boaler (1997a; 1997b) shows the impact of setting on motivation, achievement and perceptions of students in such classes. She claims that ability grouping can have a negative effect on both high and low streamed students due to the expectations of the teachers, the pacing of the lessons and the overall content to be covered. Unlike other studies where there is some support for ability grouping in terms of the gains for upper streams, Boaler reported difficulties for students in all sets in terms of qualitative experiences. Boaler indicates that in the high set classes students felt that the teachers rushed through the content of lessons too quickly without giving them a chance to develop deep understandings because they were seen to be capable of doing the mathematics. In contrast, the students in the low set classes found the work boring and lacking substantial content with the teachers assuming that they were unable to cope with the more rigorous forms of mathematics.

From a teachers' perspective, teaching in the lower streams is often a challenge. Teachers often bemoan the behaviour management in low stream classes, often placing the blame on the students for the disruptive behaviour. Offering a counter-explanation, Rutter, Maughan and Ousten (1979) suggest that where there are too many students unlikely to succeed in school as a consequence of streaming, there is a greater risk of the students developing an anti-authority peer group. They contend that placing groups of students into one class where they are likely not to succeed, there is a strong risk of excessive behavioural problems.

### *Mixed Ability Grouping*

The antithesis to ability grouping is mixed ability grouping. This approach is more amenable to the what is seen as "good practice" in contemporary mathematics – it encourages dialogue. (Linchevski & Kutscher, 1998) compared data from ability and mixed ability settings and found that there were significant gains for students in the mixed ability settings at the middle and lower levels and negligible gains for students in the upper levels. Similarly, Petersen (1989) reported that student from remedial classes learned more

in advanced classes than in the classes designed for them. Where changes were made to whole class teaching in which diversity in the class was seen as fundamental, (Mason & Good, 1993) note that greater achievement was attained by student when ability grouping was conducted within class than through fixed within groups.

In studying the impact of interactions in group work, (Good, 1990) reported students in work groups were more active learners and more enthusiastic and motivated about mathematics than students who are placed in achievement groups. In a study of computer use, Hooper (1992) reported that there are higher achievements when students work in pairs than alone, but the quality of interaction and achievement gains are influenced positively when students are in high-ability pairings.

These two diverse areas of study indicate that the practice of streaming may enhance the learning of students in the high ability groupings but at the expense of the students in the lower streams. In contrast, it was found that where mixed ability groupings were undertaken, there were greater gains in achievement for the students in the lower streams when placed in mixed ability settings. The quality of interactions and motivation were enhanced when in mixed ability settings.

The literature reviewed comes from sites outside Australasia and hence the question is asked as to whether in a country where there is greater sense of egalitarianism than in the UK or USA, whether the practice of streaming produces similar responses. The research question for this paper is:

What are the qualitative experiences for Australian youth in mathematics classrooms?

### *Method*

Using semi-structured questions, 128 students from 8 schools were interviewed. Students were in Years 9 and 10 and attended a cross-section of schools in a region of Australia. 8 students from each year level were interviewed. Teachers were asked to nominate the students based on their cross section representation of the year – to cover high and low achievement levels and high and low motivation levels. The interviews consisted of a set of 12 questions designed to cover aspects of their experiences in mathematics classrooms – teaching, content, links to assessment, worlds beyond schools, and so forth. The questions were open-ended so that students were able to discuss a range of issues. Interviews were transcribed.

Although streaming was not initially planned as a focus of the study, what clearly emerged from the data were the qualitatively different responses offered by the students in the upper streams as opposed to the students in the lower streams. As the responses were open, it was not possible to undertake a quantitative analysis of the responses as often one response could span a number of questions. However, the responses offered clearly fell into two distinct categories when considering the experiences of the students – the upper streamed students reported favourably on their teaching, learning and assessment, whereas the middle and lower streamed students reported qualitatively different experiences. Interestingly, there was no real differences in the types of responses offered by the girls to the boys, and none on the basis of schools. This suggests a common experience for gender and school type. The responses that are offered in this paper represent typical responses offered by the students from across all schools.

## Students' Experiences of Streaming

In analysing the data, several key themes emerged from the responses. Names of students and schools have been altered with the year level being indicated. The system of assessment in Queensland is five point – VHA (very high achievement), HA (high achievement); SA (sound achievement); LA (limited achievement) and VLA (very limited achievement). The first three are considered in the pass range, whereas the other two indicate failed grades.

### *Experiences of Teaching*

In considering their experiences of teaching, students commented on the levels of support the teachers offered in class, the ways in which the teachers taught, the pacing of the lessons and so on. The students in the high streams often had the more experienced teachers, and as can be seen from Annie's comment below, that this was often the Head of Department. As evident in Annie's comment, this was seen as a positive thing.

Sarah: I think we're lucky in this class because we get the best teachers. I can see the others in the lower classes and the teachers they get can't even control them so they get no work done. (Beechwood, Yr 10)

Annie: Well, I am just so glad to be in this class. We have got the head of Department so he is really good. I know there's a lot of mathematics that sort of say 'Oh yeah that's nice' but he sort of comes over and says, 'well, how did you do this one. It is exactly the same as this one, except that there's two more step' and he'll go over it and after it, if you're not right with it, he'll go 'Do you want me to do another one with you?' (Huon Pine, Yr 10)

The students in the lower streams reported different experiences with their teachers, often not seeing them in a favourable way. They offered comments that described the teachers as being unsupportive and being acutely aware of the restricted learning that was resulting from the teaching in these classes.

Travis: It's hard to do the problems on the board if you don't understand them and you don't get help. Like if you can't understand them, she just tells you to do them and if you can't do them, you just leave them. That's not really learning much. (Huon Pine, Yr 9)

Jodie: It's just boring and stuff, the things we do. How he's just talking the whole time and we're not doing anything interesting and involved. He's just telling us the same things over and over again and it's boring. (Pine Bark, Yr 9)

The difference in the responses offered by the students in the two different streams is quite stark with most students in the lower streams offering similar comments to these. In four cases, students reported that the style of teaching in the lower streams was helpful to them, but recognised this was not a widely held perception among their peers. They commented that the slower pace was particularly useful as it helped them to consolidate their thinking.

### *Pacing of the Lessons*

The pacing of the lessons was seen to be an important component of the upper stream as the students recognised that they had significant work to cover and to allow time for revision in order to prepare for the senior years.

Vicki: I like my teacher. She explains it really, really well. I like being in the top maths class because we move through the work fast enough so that we can do revision and cover all the work that's necessary for Year 11 and 12 Maths. (Beechwood, Yr 10)

While most students felt that the pace suited them, there was a recognition that some of the students in the class struggled with the content and/or pacing and that this had the potential to slow the rest of the class down.

Mike: It is good that in this class that everyone moves along quite quickly so you're not slowing down. [But] some of them just lose their way and don't try too hard and sometimes disrupt the ones that are trying to work quite hard (Pine Bark, Yr 10)

In the following quote, David recognises that he is one of the students who is struggling with this aspect but also recognises the value of being in the upper stream.

David: I find it a bit difficult, just the amount of work we're being set and the hardness of the work [but] I suppose we are getting taught at a higher level so we could get higher marks than the rest. I think we have a higher potential. I mean we have to get higher marks than the rest as we are the top class (Huon Pine, Yr 10)

In contrast, the students in the lower streams reported that the classes were often boring and slow. This was a consistent theme throughout the responses in this cohort of students. However, a limited number of students did recognise the value of the slower pace of the lessons and that this supported their learning:

Corinna: Good things [about being in this class] are that it's more to my capability than everyone else's because some of the Maths classes are really hard and this one they do it slower so you can all soak it in. (Melalucca, Yr 9)

From these selected comments it is evident that the students were aware of their qualitatively different experiences in the mathematics classrooms, from the ways in which the content was delivered through to the status of the teachers who were assigned to teaching them. Not only did the higher streamed student receive "better" teachers, the pacing of content allowed them to cover substantially more material, while the lower streams were given "poor" teachers whose pacing restricted the content to be covered. Students realised that the amount and type of content covered in class had consequences for their potential achievement in examinations, along with the overall ethos of the classroom.

### *Classroom Ethos*

All students in all classes recognised that there were qualitatively different learning environments for the upper streams than for the lower streams. The upper streams were more on-task whereas there were considerable behaviour management issues in the lower streams. Students were mindful that these very different learning environments impacted significantly on their potential to learn mathematics. The higher stream students commented that they were very pleased not to be in the lower streams as the students "mucked around" too much and this was detrimental to learning.

Steven: I prefer to be in the higher class because you don't get interrupted all the time by all the idiots. There are not as many idiots in it [the classroom] that muck around all the time. It's harder compared to what it would have been for the easier class. We're not allowed to talk as much. We don't get away with much talking compared to other classes, like the lower classroom (Pine Bark, Yr 10).

In his comments, Steven implicitly recognised that the teacher had particular expectations of the students in the higher streams – no talking, keeping on task – which were not evident in the lower streams. Similar comments were expressed by other students who saw the lower streams as sites for considerable off-task behaviour.

Michael: It is very different [in the lower streams]. I know friends in the lower classes and it's just misbehaving students that don't want to be there and it kind of wrecks it for the one that are just trying to get into higher classes. (Pine Bark, Yr 10)

The comment offered here by Michael indicates that he is aware of how the off-task behaviour in the lower streams impacts on the students who are wanting to leave the classes and move into higher streams. The students in the lower streams also were mindful that their behaviour impacted on their capacity to learn mathematics. Some students expressed anger at those students who hindered their learning:

Evan: Well in the class that I am in for maths there's a lot of noise and distractions and stuff ... I mean there's a few guys that just keep talking, talking and you really can't get your work done. (Beechwood, Yr 10)

Jasmine: Well the naughty people usually get really annoying because they keep like doing really stupid stuff to take the teacher away from what she was thinking about and we don't get taught as much as we should be and all that (Pine Bark, Yr 10)

Aside from the off-task behaviour and as Jasmine notes, the ways in which students deliberately bait the teacher to keep him/her from not teaching mathematics, there was also a recognition that the content was significantly lower than the higher stream classes as evident in the comment by Sam.

Sam: We work more at our own rate and I think it's a lot easier than what the other kids [in the higher streams] are doing. I don't really like the people that are in there [my class], because if more people did more work than me and my friends would do more work, but it's because everyone else is slacking off that we all slack off, and so our class is just really lazy and I don't like it. ... I reckon it's different [in the other classes], because all my friends, they seem to understand the Maths, but I'm sort of more, I don't know. (Beechwood, Yr 9)

Alicia: Good things [about being in this stream] are we don't do too much work that's too advanced for us, and a bad thing would be the other people that are failing bring you down as well. (Huron Pine, Yr 9)

These comments indicate that the ethos in the lower streams is a hinderance to quality learning – and is identified by students in both high and low streamed classes as being such. The students who were the instigators of the “mucking around” often recognised their implication in the hindering of learning. In some cases, students recognised that the school was attempting to support students – such as Pine Bark – where they allocated two teachers to the lower streams, but there was still a recognition that there was a lower expectation of the work requirements for this group of students. Students were quick to realise that with the lower content and expectations of the lower streams, this effectively excluded them from participating or moving out of their current grades. Furthermore, students realised that the behaviour of their peers reduced what could be achieved in these classes.

Natallie: I suppose we get a little bit more help because we have a teacher that comes and helps us. We've got two teachers helping so we get more help understanding the work. There probably isn't too much wrong except maybe we don't do as much work as the rest of the classes, like they're doing extension and they're a bit ahead so you feel like you are behind. (Pine Bark, Yr 9)

Corinna: Good things are that it's more to my capability than everyone else's because some of the Maths classes are really hard and this one they do it slower so you can all soak it in, but some bad things about it, like you can't concentrate because there's a lot of people in the class that don't take it seriously enough and they just mess it up for the rest of them. (Melalucca, Yr 9)

From the range of comments offered by students in both streams, the ethos in the lower streams acts as a significant barrier to learning mathematics in terms of the depth of knowledge being presented as well as the disruptive behaviour.

### *Assessment*

The lower expectations were also evident in assessment practices. Students in the lower streams were exposed to a restricted curriculum so that when they came to sit the Year level exams, they encountered new content and could not work out the problems, thereby restricting the grades that they could achieve. This was recognised by both the higher streamed students (such as Thomas below) and those in the lower streams.

Thomas: Some of my friends who are in different classes have said that they do really easy work and they don't do hard work, so when the hard work is on the test they just can't do it because they haven't learnt it. (Huon Pine, Yr 10)

Students in the lower streams clearly recognised how their restricted curriculum hindered their potential to move into the upper levels.

Simon: In our revision for the test we only cover the easy questions as the really hard questions are for the smart kids. They don't even have to do the process questions on the exam as they already have got an SA for maths so they can go straight to the hard ones. We don't even get taught that stuff so can't even do it on the exam. The most I can get is a SA. (Pine Bark, Yr 10)

In this comment, Simon recognises that the most he can achieve in mathematics is a pass, whereas the students in the upper streams already have this grade before they enter their exam so that the exam becomes a ground on which they can seek to improve their grades. In the following comment, Simon expresses his frustration with the processes of streaming and how the classes within which he has been placed restrict what he can achieve and is frustrated by the perception that students are to blame for their own failings.

Simon: Most of the time the stuff on the exam we haven't covered. Most of the time she says that it is not her fault that we haven't done the stuff on the exam. [She says that] it is our fault that we didn't get to cover it. I get really pissed off with that. (Beechwood, Yr 10)

It is hardly surprising to witness this frustration given the comments offered by the students in this study. There are qualitatively different experiences for the students depending on their placement in different streams. The practices noted here by the students indicate that the streaming of students in mathematics produces very different learning environments of which the students are acutely aware. While some responsibility may be placed on the students for their off task behaviour, it is also equally responsible that access to quality learning environments be provided to all students. Where students see themselves as recipients of an inferior learning environment, there may well be some justification for their frustration. Their experiences in such classrooms result in a strong sense of alienation from the discipline so that it is little wonder that they are unable to appreciate mathematics:

Simon: The only thing you could do with maths to make it better would be not to do it! (Beechwood, Yr 9)

Matt: Nothing – you just can't make maths better it is just so bad. (St Michael's, Yr 10)

In light of the comments offered by this cohort of students when discussing their experiences of school mathematics, it is concerning to note the differences in the qualitative experiences of streamed classes. These responses suggest that the practice of streaming is seen to be a positive one for the high streamed students with the converse

being the case for the lower streamed students. It raises concerns as to the long-term consequence of learning mathematics – both cognitively and affectivity – particularly for students not in the high-streamed classrooms. Questions about equity and access need to be posed for this large group of students.

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