

Does having students in ability setting affect classroom behaviour when compared to mixed ability setting in mathematics?

A small-scale action research project into the differences between ability setting and mixed ability setting when considering behaviour in mathematics classrooms.

Sean Webber
University of Chichester, UK

First Marker..... Karen Nanson

Second Marker..... Francis Duah

Word Count: 7677

Does having students in set ability setting affect classroom behaviour when compared to mixed ability setting in mathematics?

Contents Page	2
Acknowledgement.....	3
Introduction.....	4
Chapter 1 – Literature Review	5 - 10
Chapter 2 – Methodology	11 - 18
Chapter 3 – Findings	19 - 29
Chapter 4 – Conclusion	30 - 35
Appendixes	36
Tutorial Time.....	37
Ethics Form.....	38 - 57
Reference List	58 - 65

Acknowledgement

First I would like to thank Karen Nanson for giving me support during my time at University, not only as my academic adviser but also as my tutor for most of my modules and her invaluable help and guidance as my link tutor during my school placements.

I would also like to thank my other university lectures in the mathematic department as well as the education department as they have been there to give words of wisdom when needed through the last three years.

Finally, I would like to thank my friends both from university and from back home for being there for me when I needed help and support.

Introduction

I have made the decision to conduct my independent project analysing if when a student is placed into an ability set or mixed ability set if it has any relationship to their behaviour. I feel that it is a common misconception that students from top sets are well behaved and get on with the work, whereas lower sets are hard to handle and struggle to stay focused on the topic of mathematics that they are learning. This was a belief of mine until recently on my second-year placement where I noticed that this was completely contradicted. The bottom set that I had was well behaved, tried to do all the work with varying levels of success, whereas my 2nd set out of 4 were known for being difficult, didn't seem interested in doing the work and would often fail to do any of the work that they were set. This, at the time, confused me. I couldn't understand how this could happen, hence I will now be delving deeper into this issue to see if there is any correlation, finding out if there is, what the reasons could be and potentially how to combat the problem, and vice versa if there is no correlation, the reasons why a particular class are not as well behaved as another. I will also be discovering what both students and teachers believe about the behaviour in their mathematics classes.

Literature Review

Grouping students by ability has been a practice that most schools have adopted since it first came into fashion around the late 1860's (Vergon, 2018). Since then it has become a controversial issue with some teachers expressing that it is crucial for the progress of their students (Hallam and Deathe, 2002), explaining that it makes it easier for teachers to adjust the pace of their lessons. This, in turn, allows students to understand the content of the lesson better as teachers can also tailor instructions for their particular groups ability level. Others such as Oakes (1985), Ireson (2001), Hallam and Ireson (2003) and Boaler (2016) however, have found that grouping students by ability can have a detrimental effect not only on their abilities but also on their self-confidence, attitude towards school and, crucially for those around them, their behaviour in the classroom.

One issue that has been found when setting students dependent on ability level, is the students own belief about their abilities, *'beliefs about their own potential change in response to the groups they are placed into'* (Boaler, 2013, p.146). The journal suggests that children that are placed into lower ability sets and understand that they are in a lower ability set, have lower self-esteem which, in turn, can cause several issues in the classroom. Some students will use it as an excuse not to do work, not because they are not able to, but more because psychologically they see themselves as worthless (Gross, 2015). Students can also exhibit poor behaviour in the classroom as they do not see the point in doing the work that is set out for them, this could be again because they see themselves as stupid or worthless as students of all ages can comprehend if they are a higher or lower set (Boaler, 2013). According to research by William and Bartholomew (2004) children in the top sets are "the smart kids" and the

lower sets are seen as “the stupid kids”. A view that should be discouraged as it promotes the wrong image with students.

For this reason, some schools (mainly primary) try to disguise their setting by using colours or animals, some secondary schools use separate numbering systems or bands, e.g. set 1 is not always top set.

Drury (2018) suggests that we should move more towards a no-label culture as, by giving children a label, we place a ceiling on the learning that they can achieve. In this scenario by setting students by ability, we label those in the top sets as being able to do anything, whereas with lower ability sets some teachers may not challenge their pupils enough. Hargreaves (1982, p.66) argues that *‘ability labelling leads to destruction of dignity so massive and pervasive that few subsequently recover from it.’* This assumption implies that students in lower sets who are labelled as *‘not smart enough’* will consistently have this opinion of themselves, not only in mathematics, but also in other subjects and later in their life.

One of the biggest arguments against using ability grouping in schools is that it suggests that teachers do not believe in all of their students. Boaler (2016) talks a lot about giving students the opportunity to fail and grow from their experiences. These thoughts suggest that all students should be given challenging work, so that they all have the opportunity to learn from their own experiences. A mixed-ability setting can give those who normally struggle in mathematics the chance to succeed and those that are normally in a higher set to consolidate their learning. This is supported by the work of Chambers and Timlin (2019) who look into how, when students are paired up with someone of a higher ability, they excel either by being helped by those around

them, increasing their confidence, or by a '*sheer competitive edge that can develop through natural human nature*' (p.101).

There are however some positives to ability grouping students. As mentioned before teachers can tailor instructions for their particular groups ability level, then sub-differentiate work accordingly. This gives specialised help to those that need it while also letting those that are more able to flourish. On this point Muijs and Reynolds (2011) suggest that, in fact, results of ability grouping experiments tend to come out as having no effect at all, meaning that neither higher or lower ability groups get any worse from their experience, with some researchers suggesting that in fact for the higher ability students, their results improve (Tieso, 2003). This, however, is countered by Neihart (2007) and Preckel et al (2006) who both say that although the high stakes national testing results may not have changed or have had slight improvement, due to ability setting students, the mental well-being of the students is still being compromised. This therefore "*in the long term may have a detrimental effect on the student's well-being*" (Muijs and Reynolds, 2011, p.208).

Overall, ability setting in secondary mathematics can, given the right environment, be beneficial to some students, especially those of higher ability and Keg Stage 3 (William, and Bartholomew, 2004). The overarching opinion of researchers in education seems to be a negative one. Given the current climate of education, with exams getting harder and more pressure being put on students, ability setting seems to be causing more of a problem than a solution. As suggested before, ability setting students can have a detrimental impact on their mental well-being, this can cause other issues in the classroom. It can potentially affect the motivation of a pupil, it could affect the results that the student obtains, however one of the growing problems that we are seeing in our secondary schools is that of behaviour.

'Behaviour management is one of the most crucial elements a teacher needs to get right in order for them to be a successful teacher' (Rodgers, 2015). It is believed that strong behaviour management can lead to children becoming more engaged with the learning, this in turn making the students more able mathematicians (Crone, 2002). Therefore, pupils are able to achieve better mathematics results, which also has been shown to improve job prospects and future opportunities (Hodgen, 2013). Over the last decade behaviour management has been seen to be an issue in general in our secondary schools, getting talked about not only by people in the industry/Ofsted, but also in the national newspapers. In 2014, a report on behaviour, commissioned by Sir Michael Wilshaw, calculated that in some secondary classrooms pupils were missing out on up to 38 days a year of their education as a result of teachers dealing with low-level disruptive behaviour, because of this, in 2015 the common inspection framework highlighted that inspection procedure must change to judge behaviour and pupil attitudes.

However, in order to begin to solve these problems, first we must get to the roots of the issues that cause students to not behave appropriately in the classroom. McManus (1995) points out that troublesome behaviour cannot be understood without considering it in several 'spheres': individual, family, classroom, school, community and the whole society.

When looking at the individual, the student may have been through some personal trauma, this could potentially cause behaviour equivalent to attention seeking, students prefer positive praise, however *'some student will take any interaction with the teacher that they can get, positive or negative'* (Balaji, 2017, p.142). This idea can stem from the other 'spheres' a lack of attention in the family dynamic can lead to

students wanting better or more of a relationship with the next closest adult, in this case the teacher.

One of the biggest problem's teachers face in their own classrooms is trying to keep students in the classroom. This is mainly down to a lack of resilience and a culture of "can't do it". '*Student opinions of themselves has caused a society with a lack of resilience*' (Gray, 2019). This in turn has caused students to stop doing their own work and distract others causing low level disruption in the classroom. This however is not the only problem that causes low level classroom behaviour, some researchers have suggested that it is because classes are ability set.

Finley (1984), Hargreves (1967), Schwarts (1981) and Taylor (1993) suggest that '*Pupils in lower ability classes tend to have more negative attitudes towards school and often exhibit poor behaviour in the classroom which makes them more difficult to teach.*' However, as has been argued above, there are many other factors as to why student's behaviour tends to dip in lower ability classes. It is suggested by Rosenbaum (1976) that '*teachers of high ability groups tend to be more enthusiastic about teaching.*' when compared to those that teach a lower ability set. Teachers' attitudes towards their classes is crucial to set the tone for the students. If a teacher is not enthusiastic about their subject, then the students that they are teaching in their class will also be unenthusiastic, in turn causing more behaviour problems and making it harder to teach.

In conclusion, the impact of ability grouping on the behaviour in the classroom seems to be an important area of research, although lower ability classes tend to have a more negative opinion of school (as stated before) is this caused by being in a lower ability set, or are there other potential issues, for example social economic climate, family or

living situation, that is causing more of a detrimental impact on their learning. Also how does ability setting affect the higher sets, because they are more able, does that make them well behaved automatically or are there potential issues surrounding the higher sets as well.

Methodology

This section introduces the research methods that were used on this project, discusses the purpose of them and shows the reasons why these methods were used. This study was a mixed methods study. This method of using both qualitative and quantitative data allowed for a deeper understanding of how students and teachers perceived the behaviour in their school. It also showed what their own thoughts and feelings were when talking about the differences between mixed ability grouping and set grouping, while allowing them to express their opinions on issues that can develop in the classroom environment when thinking about behaviour and how to handle potential problems. This section will also look at where the project was conducted, how the project was designed and implemented, how the participants were sourced, how the results will be analysed and any ethical concerns that may have cropped up with clear guidelines on how this was solved.

Research questions

After careful consideration of the research found in chapter 1 (the literature review).

This action research attempted to answer the following questions:

- 1) Does mixed ability set or ability setting have the advantage when it comes to behaviour in the classroom?

- 2) Are there other areas in the classroom environment that are affected by having mixed ability or ability set classes?

- 3) What other considerations must be considered when looking at behaviour in the classroom environment?

Mixed method research

By using a mixed method study, the research gained the benefits of both quantitative and qualitative data. This is so the questions can be answered more comprehensively, allowing for better results when discussing the questions suggested above (Creswell, 2002). Another reason for conducting this research in this manner is because neither qualitative data nor quantitative data are sufficient by themselves to give the best possible answers. *“When used in combination, quantitative and qualitative methods complement each other and allow for more complete analysis”* (Green, Caracelli, & Graham, 1989, p.6) this is also backed up by more recent research by Tran (2019, p.4) who suggests that *“In projects that involve younger participants, mixed method studies allow children to express themselves in multiply ways.”* Ultimately, it *“produces an understanding of the problem based on multiple contextual factors”* (Miller, 2000).

Location and Participants

The school that will be the focus of this action research is an academy sponsor led, mixed gender, senior school in West Sussex which hosts 1398 pupils between the ages of 11 to 18. The mathematics department currently uses ability setting for their classes with years 7-9 split into 4 sets and years 10 and 11 split into 5 sets. The participants that are involved in the study were selected using convenience sampling. These were taken from classes that the researcher taught over the course of the placement. The ethical considerations and validity of this will be talked about later in

this chapter. The reason for using this sampling technique is mainly due to the restrictive time constraints on the project. By sampling this way, it allowed the research to be conducted quickly and efficiently (Sedgwick, 2013). However, sampling in this way can cause some concerns as to the validity of the study. The research is highly vulnerable to selection bias and influences beyond the control of the researcher. How the researcher has dealt with this issue will be made apparent in the validity section of this chapter. The participants that have been used in this study include: 30 year 7 students of mixed gender in set 2 out of 4; 28 year 9 students of mixed gender in set 3 out of 4 and 5 male year 11 students in set 5 of 5. There are also 6 mathematics teachers that are involved in the study. The plan for the study also included 20 year 10 students of mixed gender in set 4 out of 5 and 5 year 11 girls that were in the same class as the males stated above. These students were unfortunately unable to take part in the study due to the project being stopped early due to the outbreak of COVID-19 and the subsequent lockdown that took place closing the school where the project took place.

Data Collection and Procedure

The data for this project was collected using field notes made over the course of the 9 weeks, group interviews consisting of 3 students at a time with 1 group of 2, solo 1 on 1 interviews with teachers, questionnaires and data that they school already had on their Go4Schools (2020) website.

The field notes come from a collection of notes made by the researcher over the course of the 9 weeks, this includes passing comments by teachers and students, observation notes and general information picked up over the time spent in school.

Field notes are important as it allows the researcher to obtain information without students and teachers potentially feeling pressured into answering a certain way (Mulhall, 2003), the ethical considerations involved in using field notes will be discussed in the ethics section of this chapter.

From the classes that were used in this study, 9 students were randomly selected by lollipop sticks by the normal class teacher, they were then divided into 3 groups of 3 creating 6 groups over the year 7 and year 9 classes (one of the students was absent on the day of the interview hence there was 1 group of 2) The students were all asked to discuss, how they feel behaviour is dealt with by their mathematics teacher, what they think of the behaviour in their mathematics class when compared to other classes and what they believe is the main reason why the behaviour of their class is like it is. This data was recorded using a dictaphone and then later answers to questions were typed up, ethical considerations were made for this and will be discussed later. Interviews were also conducted with members of the mathematics teaching staff. These interviews were conducted on a 1 on 1 bases, the teachers were all asked 4 main questions: what they believed to be the best approach to teaching in mathematics, mixed ability setting or ability setting; What they believed to be the cause of any behavioural problems that present themselves in the classroom environment; which set they find the easiest to teach, the reasons why and finally what they think would change if the mathematics department changed from ability setting students to mixed ability setting them, ask firstly about any behaviour changes and then followed up by asking about any other changes that they think may happen as a result of the change. Again, these will be recorded on a dictaphone then transcribed later.

The questionnaires that were used consisted of 10 questions, all 10 questions used Likert scales from 1 to 5 with 1 being the lowest (meaning to strongly disagree with the statement) and 5 being the highest (meaning to strongly agree with the statement), the questions can be found in appendix 1 of this document. The questionnaires were given to 1 class of year 7's (30 students), 1 class of year 9's (28 students) and 5 year 11 students, before the questionnaires were given out the researcher left the room so that the normal teacher could assign numbers to the students involved, when the questionnaires were handed out this number replaced the name of that student as to keep it anonymous and so that a paper could be identified if the student decided that they didn't want to participate later on. The researcher then collected the questionnaires in after, hence the researcher was unaware of what student was what number and the main class teacher was not aware of what each student said.

Finally, the data collected from the Go4Schools (2020) website included quantitative data on what behaviour points had already been given out that year up to 1st April 2020, both positive and negative. The data that was obtained included the points collected by all students in years 7 to 11 in mathematics and English. The rationale for also collecting the results in English were to compare the differences between the two subjects, this was because where mathematics uses ability setting, English uses mixed ability setting and it was felt by the researcher that these were the closest two subjects in terms of academic requirement that had different ways of setting. This idea is also backed by the research of Towers et al (2020) who suggests that although the subjects are very different from an onlooker's point of view, that they actually have a lot of similarities in the classroom setting. They are both core subjects, they both involve long periods of sitting down copying from a board and they are both subjects

that students seem to love or hate, hence in general students should in theory behave in similar ways in these classes given the same conditions. At this school however there is a difference in the way that they are set, therefore any changes in behaviour could be the result of this.

Data analysis

The data that is collected will be analysed to answer the research questions above.

Firstly, by using the Go4School's data to create a baseline opinion about the school itself, in order to better understand the behaviour management strategies that are already in place. It is important to obtain this as "*baseline data should always serve as a starting point for research questions*" (Titheradge et al, 2019, p.2). This information will also start to suggest the answers to the research questions from a quantitative point of view. It will then be compared to the rest of the data to see if there is a trend between this data, the opinions of the participants involved in the interviews and questionnaires. The data itself will be analysed using Microsoft excel.

To answer the first question, the mean results from the behaviour points in both English and mathematics will be compared to see if there is a significant difference between them, after this interview questions and questionnaire questions referring to question 1 will be looked at and an overall summation of the two results will be made.

For question 2 a spearman's rank will be taken of the mathematics sets in each year half. If the results between the year halves are different it can be argued that the way in which students are setted may not be the only reason for problem behaviour in the

classroom. After this the evidence from the interviews and questionnaires will be looked at to create an overall conclusion to the question.

Finally, for question 3, the analysis will come from the interviews and questionnaire. The most common answers will be compared and the results of this will form the conclusion to the question.

Validity

For a study to be valid and trustworthy it must be shown to have been conducted without bias, have had appropriate measures put in place in order for the results to be considered just (including using scientific testing) and have repeatable results (if the same test was to be conducted the same results would be seen) (Kyngäs et al, 2020). Randomization will lessen external validity problems, but no method can be completely successful. Some of the data collected was at random, the interviewees were selected at random and although the questionnaires were all given to certain classes these were not chosen by the researcher hence there would be no bias from that point of view. Another way in which the researcher has shown to be unbiased is from the handling of the questionnaire, by numbering them rather than having names, the researcher can obtain the data without having to know which student the answers were coming from.

Ethical Considerations

Due to this study involving students under the age of 18 there has had to be many ethical considerations made for the project to go forward. All documentation including the names of the students, information about the student, voices of the students

(including the transcripts and voice files) and any signed documentation remained on the school site at all time kept in a locked cupboard. All transcriptions were typed up on school computers and saved onto encrypted memory sticks also kept in a locked cupboard in the school building. All voice recorded interviews were stored on an encrypted memory stick and only used in the school building. Information only left the school at the end of the placement after it had been checked that all names had been removed by another member of staff, only information and data relating to the study were included. During questionnaires and interviews students were all told what the study involved, what they needed to do and what they needed to do if they did not want to participate in the study, it also included what they would have to do if they said yes now but later did not wish to participate and another member of staff was always present while conducting these. All students and teachers involved were asked to sign a form stating that they had understood the information above. As a final point if field notes were used the teacher or student involved was made aware and a right to refuse the use of the information was given.

Findings

This chapter will show the results of the data collected over the course of the project, this will include the results of the information found on Go4Schools, a summary of the data collected from staff and students who participated in the project and the answers that the data suggest to the research questions. This chapter will also take each question and suggest an answer using the results that have been presented.

Go4Schools Data

Maths		Positive points					Negative Points					
Year Group	Set	Points (a)	Points (b)	Pos % (a)	Pos % (b)	Ave Pos	Points (a)	Points (b)	Neg % (a)	Neg % (b)	Ave Neg	
7	1	7652	9215	28.7%	34.4%	31.6%	127	254	4.1%	12.0%	8.0%	
7	2	6514	5142	24.4%	19.2%	21.8%	921	356	29.7%	16.8%	23.3%	
7	3	8941	7295	33.6%	27.3%	30.4%	536	254	17.3%	12.0%	14.6%	
7	4	3540	5101	13.3%	19.1%	16.2%	1512	1256	48.8%	59.2%	54.0%	
8	1	2864	5421	21.9%	36.5%	29.2%	614	812	10.2%	12.3%	11.3%	
8	2	3291	3925	25.2%	26.4%	25.8%	1245	1824	20.7%	27.7%	24.2%	
8	3	4152	3564	31.8%	24.0%	27.9%	1145	1169	19.0%	17.7%	18.4%	
8	4	2764	1945	21.1%	13.1%	17.1%	3014	2784	50.1%	42.3%	46.2%	
9	1	1721	1954	26.4%	38.4%	32.4%	258	521	21.7%	41.4%	31.5%	
9	2	1648	927	25.3%	18.2%	21.7%	165	452	13.9%	35.9%	24.9%	
9	3	1124	1028	17.3%	20.2%	18.7%	145	126	12.2%	10.0%	11.1%	
9	4	2021	1185	31.0%	23.3%	27.1%	621	160	52.2%	12.7%	32.5%	
10	1	891	457	33.4%	30.3%	31.9%	45	169	5.9%	22.5%	14.2%	
10	2	672	125	25.2%	8.3%	16.7%	212	156	27.7%	20.7%	24.2%	
10	3	372	245	13.9%	16.2%	15.1%	354	79	46.3%	10.5%	28.4%	
10	4	732	681	27.4%	45.2%	36.3%	154	348	20.1%	46.3%	33.2%	
11	1	524	467	23.8%	23.0%	23.4%	54	29	12.3%	6.6%	9.5%	
11	2	625	521	28.3%	25.7%	27.0%	62	112	14.2%	25.6%	19.9%	
11	3	245	425	11.1%	21.0%	16.0%	115	104	26.3%	23.8%	25.0%	
11	4	812	614	36.8%	30.3%	33.5%	207	192	47.3%	43.9%	45.6%	
English												
Year Group	Class	Points (a)	Points (b)	Pos % (a)	Pos % (b)	Ave Pos	Points (a)	Points (b)	Neg % (a)	Neg % (b)	Ave Neg	
7	A	3141	3154	22.8%	25.7%	24.3%	2752	3622	25.8%	50.1%	38.0%	
7	B	4611	2698	33.5%	22.0%	27.8%	2069	1502	19.4%	20.8%	20.1%	
7	C	3253	1718	23.7%	14.0%	18.8%	3749	1478	35.2%	20.5%	27.8%	
7	D	2745	4682	20.0%	38.2%	29.1%	2083	625	19.6%	8.6%	14.1%	
8	A	1744	3391	15.9%	30.4%	23.1%	564	1201	11.8%	34.9%	23.3%	
8	B	2418	1902	22.0%	17.0%	19.5%	2401	549	50.4%	15.9%	33.2%	
8	C	3707	3856	33.7%	34.6%	34.1%	684	951	14.4%	27.6%	21.0%	
8	D	3119	2009	28.4%	18.0%	23.2%	1116	745	23.4%	21.6%	22.5%	
9	A	886	1090	25.0%	28.1%	26.5%	2015	564	48.4%	27.0%	37.7%	
9	B	828	1119	23.3%	28.8%	26.1%	1205	627	29.0%	30.0%	29.5%	
9	C	797	629	22.5%	16.2%	19.3%	451	245	10.8%	11.7%	11.3%	
9	D	1036	1041	29.2%	26.8%	28.0%	489	654	11.8%	31.3%	21.5%	
10	A	946	1228	28.9%	38.1%	33.5%	124	206	18.9%	39.7%	29.3%	
10	B	724	711	22.1%	22.1%	22.1%	304	98	46.3%	18.9%	32.6%	
10	C	475	881	14.5%	27.4%	20.9%	154	106	23.5%	20.4%	21.9%	
10	D	1127	401	34.4%	12.4%	23.4%	74	109	11.3%	21.0%	16.1%	
11	A	245	635	11.8%	26.0%	18.9%	52	67	17.6%	37.6%	27.6%	
11	B	378	321	18.3%	13.2%	15.7%	45	20	15.2%	11.2%	13.2%	
11	C	491	1001	23.7%	41.1%	32.4%	97	54	32.8%	30.3%	31.6%	
11	D	954	481	46.1%	19.7%	32.9%	102	37	34.5%	20.8%	27.6%	

Key for Go4Schools Table

Year Group – The year in which the students are in

Set/Class – What Set (Mathematics) a student is in 1 being for higher ability and 4 being for lower ability, Class (English) shows which group a student has been put into, there is no ranking between A to D as the students are placed into mixed ability groups in English.

Points (a) – Shows the positive or negative points total for that year halves year x, set/class y

Points (b) – Shows the positive or negative points total for that year halves year x, set/class y

Pos/Neg % (a) – Shows the percentage of positive/negative points obtained by a single set/class out of the total points obtained by that year half

Pos/Neg % (b) – Shows the percentage of positive/negative points obtained by a single set/class out of the total points obtained by that year half

Ave Pos/Neg – Shows the average percentage between the 2 year half classes that are of the same year and set/class

Summary of Go4Schools Data

Some of the general trends that can be seen by this data are that points tend to appear more frequently in the lower years (KS3). This is one of the reasons that it was decided that a percentage would be the best way to analyse the data. This also became more apparent while observing lessons, teachers tended to give out more points (both positive and negative) during their lessons with years 7, 8 and 9. Another observation that was made while looking at the Go4Schools website was that English and mathematics tended to give out more points than any other subjects, because of this

English was partnered with mathematics for this research. One reason why this could be the case is because mathematics and English teachers see their students more often than any other subject with up to 10 lessons a fortnight.

Student Questionnaire Data

Interview Questions	Amount of students that answered					Interview Questions	Amount of students that answered				
Students	1	2	3	4	5	Students	1	2	3	4	5
Class: 7a2 Students :30						9b3 Students :28					
1) The behaviour of other children in my maths class is generally good	0	1	3	21	5	1) The behaviour of other children in my maths class is generally good	3	8	10	7	0
2) My behaviour in my maths class affects the learning of all the other students	0	5	2	18	5	2) My behaviour in my maths class affects the learning of all the other students	0	3	2	17	6
3) When other students misbehave in my maths class I struggle to get the best out of the lesson	0	4	6	15	5	3) When other students misbehave in my maths class I struggle to get the best out of the lesson	0	0	5	15	8
4) Behaviour is better in my English class than my maths class	0	1	2	15	12	4) Behaviour is better in my English class than my maths class	1	12	10	5	0
5) I enjoy my maths lessons	0	2	4	16	8	5) I enjoy my maths lessons	6	4	11	5	2
6) My teacher is always fair when awarding positive and negative points in my maths class	1	1	10	14	4	6) My teacher is always fair when awarding positive and negative points in my maths class	6	13	6	3	0
7) I try my hardest to earn as many positive points in maths as I can	0	1	0	21	8	7) I try my hardest to earn as many positive points in maths as I can	0	14	11	3	0
8) I try my hardest to avoid getting negative point in maths	0	0	0	25	5	8) I try my hardest to avoid getting negative point in maths	0	2	19	6	1
9) My maths teacher is enthusiastic when they are teaching me	0	6	12	10	2	9) My maths teacher is enthusiastic when they are teaching me	7	12	8	1	0
10) I understand the system that is in place for negative behaviour, (verbal warning, C1, C2, Removal)	0	1	2	17	10	10) I understand the system that is in place for negative behaviour, (verbal warning, C1, C2, Removal)	1	1	4	12	10

Summary of Student Questionnaires

Students were asked 10 questions related to behaviour in their mathematics and English classes. The students that were asked to take part in the study all seemed enthusiastic to participate, none of the participants refused to answer the questionnaire nor did any decide afterward that they no longer wanted to participate in the study. The general trend of the data shows a more positive picture in the year 7 (set 2) results than the year 9 (set 3) results. According to this questionnaire students in the higher set believed that behaviour was generally better, that their mathematics class was better behaved than their English class, that they tended to enjoy their

lessons more and that their teacher was enthusiastic about the lessons that they were teaching.

Summary of Student Interviews

During these interviews 3 questions were asked.

- 1) How do you feel behaviour is dealt with by your mathematics teacher?
- 2) What they think of the behaviour in their mathematics class when compared to other classes?
- 3) What do you believe is the main reason why the behaviour of your class is like it is?

Looking back through the transcripts, most of the students responded to the first question positively. Of the 17 students interviewed, 14 suggested that behaviour in their mathematics classes were dealt with well and although sometimes they disagreed with what the teacher was saying at the time, that normally the teacher would then explain what their reasoning was and why the original disagreed upon praise or punishment was deserved. The students all agreed that this was important for the class to understand what acceptable behaviour in their classes were. From this, some students lead into question two by suggesting that although this was done in mathematics, that not a lot of other lessons did this. Although this information did not help with the initial question of what is better mixed or ability setting it does give some information for the other research questions.

With question 2, again students tended to talk about mathematics in a positive light, some suggested other subjects that had behaviour that was not as good as their mathematics class. Although it was also highly commented that behaviour during PE lessons was normally better than mathematics. When asked why they thought this

was, some answered suggesting that PE was more fun or interesting and did not involve having to write lots down, others suggested that it was because their PE teacher was 'nicer'. During this discussion students also made comments that mathematics teachers tended to be stricter than their other teachers but that sometimes this was a good thing as it meant that they learnt more.

For question 3, many students began by suggesting certain individual students in the class were to blame. At this point it was made clear to the students that the questions' intention was not to pin blame on particular individuals but to express what the reasons for potential disruptions were. Many were unsure how to answer this question, some (from year 9) suggested that negative behaviour was because they did not understand what they were meant to do in class, another reason was that the work was too challenging for them. Not a lot was gained by this question and if the research were repeated it would be advised to adapt this question to make it more accessible for the students involved.

Summary of Staff Interviews

During these interviews 4 questions were asked.

- 1) What do you believe to be the best approach to teaching in mathematics, mixed ability setting or ability setting?
- 2) What do you believe to be the cause of any behavioural problems that present themselves in the classroom environment?
- 3) Which set they find the easiest to teach and the reasons why?
- 4) What they think would change if the mathematics department changed from ability setting students to mixed ability setting them?

Out of the 5 members of the teaching staff involved in these interviews, 3 concluded that ability setting was better, their arguments consisted of arguing that by having ability setting it was easier to teach students as the differentiation could be specifically tailored to the classes needs. It was also commented that when it came to GCSE classes (year 10 and 11) that mixed ability setting allowed teachers to focus on whether the class was taking the foundation or the higher paper. 1 of the teachers concluded that it was better to have a range of abilities in the classroom. Their reasoning for this was that it allowed those of lower ability to learn from those of higher ability, this made group work easier as at least one student from each group would be able to help the others out. This member of staff did, however, concede that by having mixed ability setting it would make their job harder as it meant that they would have to work harder to differentiate their activities accordingly, as to keep a balance of difficulty for all students to be able to succeed. 1 member of staff was undecided, they said that there were positives and negatives for both types of setting students.

When discussing question 2 none of the teachers involved commented that the way in which students were setted was a reason for any behaviour problems in their classrooms. However, all of them commented about the school's location and about how working in a socially deprived area develops students that are more difficult to control in the classroom environment. Other difficulties that they all talked about included the amount of SEND and EAL students in their classes. 3 of the teachers commented about how friendship groups (especially in the lower years) can cause problems. It was made prevalent that this had been a major problem across the school with the year 8's, not just in mathematics. Another issue that was brought up by 1 of the teachers was that students just seemed uninterested in mathematics.

Question 3 created discussion contrary to previous research done in this field. Previous research suggested that teachers tended to prefer working with higher ability sets, however out of the 5 teachers interviewed, 4 talked about how they prefer to teach the lower sets, suggesting that working with lower ability gave them a higher sense of achievement when they succeeded. They also commented on how they enjoyed the challenge of working with a lower set. This could also be seen when observing these teachers teaching, it could be suggested that they were more enthusiastic teaching the lower sets than they were the higher sets.

The main concern brought up in question 4 was that by changing to a mixed ability set format that it would increase teacher workload. Although 3 of the interviewees talked about how they were open to the change if the school decided to go in that direction. They also stated that they would only be onboard if they could be guaranteed that their workload would not increase. They also suggested that if this change was implemented, they would be concerned that students would not get the full benefits due to previous attempts to place higher ability students with lower ability students conducted a couple of years ago, this was done in support groups and not as a full scale change to the departments policy. However it was also suggested during this question that a change to mixed ability setting may allow students to feel more confident about themselves, by not having children set in abilities the staff suggest that students in lower set would not feel 'stupid' for being in a lower set. It was also suggested that it would stop some of the complacency held by higher ability sets.

Question 1: Does mixed ability setting or ability setting have the advantage when it comes to behaviour in the classroom?

To answer this question, the data from Go4schools will be used. Firstly, by creating a Spearman's rank of the mathematics classes data both in the positive points and in the negative points. By doing this we see if there is a correlation between the set a student is in and the amount of points achieved by each class. Then both the mathematics class and English class data will be looked at to see which classes achieve the most positive and negative points.

Year Group	Set	Pos % (a)	Pos % (b)	Ave Pos	Rank of S	Rank of A d	d^2
7	1	28.7%	34.4%	31.6%	3	5	-2
7	2	24.4%	19.2%	21.8%	8	13.5	-5.5
7	3	33.6%	27.3%	30.5%	13	6	7
7	4	13.3%	19.1%	16.2%	18	18	0
8	1	21.9%	36.5%	29.2%	3	7	-4
8	2	25.2%	26.4%	25.8%	8	11	-3
8	3	31.8%	24.0%	27.9%	13	8	5
8	4	21.1%	13.1%	17.1%	18	16	2
9	1	26.4%	38.4%	32.4%	3	3	0
9	2	25.3%	18.2%	21.8%	8	13.5	-5.5
9	3	17.3%	20.2%	18.8%	13	15	-2
9	4	31.0%	23.3%	27.2%	18	9	9
10	1	33.4%	30.3%	31.9%	3	4	-1
10	2	25.2%	8.3%	16.8%	8	17	-9
10	3	13.9%	16.2%	15.1%	13	20	-7
10	4	27.4%	45.2%	36.3%	18	1	17
11	1	23.8%	23.0%	23.4%	3	12	-9
11	2	28.3%	25.7%	27.0%	8	10	-2
11	3	11.1%	21.0%	16.1%	13	19	-6
11	4	36.8%	30.3%	33.6%	18	2	16
							1049.5
				Spearman's Rank	0.2109		
				$1 - \frac{(6 \cdot L_{23})}{(20 \cdot ((20^2) - 1))}$			
Year Group	Set	Neg % (a)	Neg % (b)	Ave Neg	Rank of S	Rank of A d	d^2
7	4	48.8%	59.2%	54.0%	18	1	17
8	4	50.1%	42.3%	46.2%	18	2	16
11	4	47.3%	43.9%	45.6%	18	3	15
10	4	20.1%	46.3%	33.2%	18	4	14
9	4	52.2%	12.7%	32.5%	18	5	13
9	1	21.7%	41.4%	31.6%	3	6	-3
10	3	46.3%	10.5%	28.4%	13	7	6
11	3	26.3%	23.8%	25.1%	13	8	5
9	2	13.9%	35.9%	24.9%	8	9	-1
8	2	20.7%	27.7%	24.2%	8	10	-2
10	2	27.7%	20.7%	24.2%	8	11	-3
7	2	29.7%	16.8%	23.3%	8	12	-4
11	2	14.2%	25.6%	19.9%	8	13	-5
8	3	19.0%	17.7%	18.4%	13	14	-1
7	3	17.3%	12.0%	14.7%	13	15	-2
10	1	5.9%	22.5%	14.2%	3	16	-13
8	1	10.2%	12.3%	11.3%	3	17	-14
9	3	12.2%	10.0%	11.1%	13	18	-5
11	1	12.3%	6.6%	9.5%	3	19	-16
7	1	4.1%	12.0%	8.1%	3	20	-17
							2200
				Spearman's Rank	-0.6541		
				$1 - \frac{(6 \cdot J_{48})}{(20 \cdot ((20^2) - 1))}$			

As can be seen from the data the positive points had a spearman's rank score of 0.2109 which shows a small positive correlation, therefore it can be concluded that the higher the set a student is in the more positive points that class achieves, although

with a small score such as this it could also be speculative that the abilities setting makes a difference.

The negative points show a strong negative correlation, hence it can be concluded from this that it is very likely that the lower ability sets receive more negative points. This information would suggest that lower ability sets have worse behaviour.

Now to compare this to the English classes in order to see if it can be suggested that mixed ability or ability setting is better for behaviour.

	Positive		Negative	
	Maths	English	Maths	English
<i>Year 7</i>	53400	26002	5216	17880
<i>Year 8</i>	27926	22146	12607	8211
<i>Year 9</i>	11608	7426	2448	6250
<i>Year 10</i>	4175	6493	1517	1175
<i>Year 11</i>	4233	4506	875	474

Looking at this data we can see that in years 7, 8 and 9 more positive points are given in mathematics than in English, in years 7 and 9 less negative points have also been given out in mathematics. From this data it can be concluded using the assumption that more positive point means better behaviour and more negative points means worse behaviour, that in Key Stage 3 (years 7, 8 and 9) behaviour tends to be better in mathematics than in English and therefore can be interpreted as ability setting is better for behaviour than mixed ability setting. However, when students get older and enter Key Stage 4 to opposite is true.

Question 2: Are there other areas in the classroom environment that are affected by having mixed ability or ability set classes?

To answer this question, data from the interviews from student and teaching participants will be used. Initially the research suggests that one of the reasons that ability set classes have behaviour issues is because they are aware of what set they are in. When talking to staff during interviews this finding was also seen, this combined with the field notes made during the research suggests that behaviour is not the only issue that comes up during this. The interviews suggest that lower ability set can sometimes feel stupid and inadequate because of the sets they are put into. In the same vein higher sets can get complacent with what they are doing hence, they will start to make poor mistakes in their work. This shows that as well as behaviour the mental state of students can be affected by having ability sets.

Question 3: What other considerations must be considered when looking at behaviour in the classroom environment?

Initial concerns that enthusiasm for teaching lower sets affected behaviour in the classroom were not seen in this research data. From the data that can be seen, teachers seemed to have more enthusiasm for teaching lower ability sets, however it could be argued that this has only been seen due to the low population size. However, one issue that came up in previous research was suggested by the participants in the study. Social economic problems were suggested as one of the reasons behind poor behaviour in the classroom, hence when looking into behaviour, the social economic climate of the school must be looked at too. When talking to students, they believed that the teacher in charge of the class was important when looking at the behaviour of their classes. Their attitude towards their classes has been seen to be very important.

If a student enjoys the lessons that they are a part of and have a good working relationship with their teacher then behaviour tends to be better in the class.

Limitations

Over the course of this study there were some limitations that must be considered. Firstly, the number of participants, the original plan for the study included many more participants however due to the COVID-19 outbreak the amount of participants had to be reduced. This may have impacted on the results of the study. One of the other limitations of this study was the school that was used. By using a school in a socially deprived area the results may be more weighted to that type of school, if the research was conducted in a more affluent area the results may differ and in turn affecting the validity of the results.

Conclusion

The final chapter in this research study will conclude the research questions that were discovered while constructing the literature review. This will be done by summarising the findings found in chapter 3 and linking the answers to current research that has been conducted in this field. It will also suggest whether the findings match what is being said already and if not the reasons why this could be. This chapter will also show any recommendations that can be suggested for future practice in the teaching profession.

The focus of this research study was to investigate whether students in ability set mathematics classes had differing behaviour when compared to mixed ability setting students.

Question 1: Does mixed ability setting or ability setting have the advantage when it comes to behaviour in the classroom?

The overall conclusions that can be made from the findings are that ability setting is better for behaviour for key stage 3 (years 7, 8 and 9) and mixed ability setting is better for key stage 4 (years 10 and 11). This links to research by Sands and Kerry (2020) who suggests that mixed ability setting is important when considering split exams (into foundation and higher) by having classes mixed, students taking the foundation paper are able to still experience the higher element that is included on their paper while also being helped out by those with a higher mathematical ability, this in turn assists with controlling the behaviour of a class as it allows for appropriate challenge for all students involved. This idea is also backed up by the research of Verma et al (2002) who suggests that in ability set classes students can feel the pressures of the exam

that they are taking. However, these results do go against research that has been conducted in this field. Kirkman et al (2002) makes the point that some students in this system will struggle due to the lack of challenge presented in lessons. This can suggest the converse would also be true that some students would feel lost and 'stupid' when the challenge is too great. This, in turn, causes behavioural issues in the classroom environment.

Although the previous statements do bring up another argument, why is this strategy less effective in key stage 3? One reason for this could be the move towards a mastery curriculum. In the school where the study took place, the idea of mastery was only being utilised in key stage 3 with the maths mastery program. Although all students are being subjected to the same material, having an ability setted system allows for the work to be pitched at the level that is appropriate for the specific students. "*a well-pitched lesson contributes to strong behaviour in the classroom*" (Mcgill, 2013, p.4 and Reynolds, 1998, p.156). It can however be suggested by the research of Ries et al (1992) that the whole idea of having a mastery curriculum is to have students that are all progressing at the same rate know matter what their mathematical ability maybe, therefore because all students are under equal challenge the earlier argument is invalid. This idea only seems to work on paper after looking at the findings of this research.

In conclusion, for this question neither approach seems to have a clear advantage for across an entire school mathematics department. For progress to be made it can be concluded that a mixture of both methods may have to be used to improve behaviour across all year groups.

Question 2: Are there other areas in the classroom environment that are affected by having mixed ability or ability set classes?

When analysing if mixed ability or ability setting classes affects behaviour, it became apparent that there were other areas that are affected other than behaviour. One area that was talked about in staff interview was the effect that ability setting classes had on the mental wellbeing of students. Results from this study showed that members of staff believed that some students in lower sets felt 'stupid' due to being in a lower sets, this impacted the work that they would produce due to their own opinion of themselves. It was also noted that higher sets were seen to at times be complacent and equally not complete the work. This idea is backed up by the research of Simms (2016) Boaler (2009) and Boaler (2015) who both talk in-depth about the importance for student's mental health in the classroom. *"I don't want to be a stupid person"* (Boaler 2009, p.109) this quote sums up the opinion that many students feel (especially those that are in lower sets) about mathematics. By students evaluating themselves in this way other issues can emerge, *"I have found that students in setted classes not only developed ideas about their own potential, but they begin to categorise others in unfortunate ways"* (Boaler, 2009, p.109). This is how these problems start to look like behaviour issues when there is a more psychological reason at work.

Another area that has to be looked at when discussing the classroom environment is the workload of the teachers involved. *"Teachers with a higher workload will not perform as effectively as those that have a lesser workload"* (Butt and Lance, 2005, p.420). In interviews with staff on this subject one of the main concerns with changing from ability setting to mixed ability setting was the amount of work that having to

differentiate for mixed ability classes would bring. This effect has a direct implication on the teaching conducted in a lesson (Easthope and Easthope, 2000).

This question can be concluded with a simple yes. There are other considerations that must be taken into account when discussing the advantages and disadvantages of mixed ability and ability set classes.

Question 3: What other considerations must be considered when looking at behaviour in the classroom environment?

One of the main considerations that was looked at on this question was teacher enthusiasm, research into this area suggests that teachers tend to be more enthusiastic when teaching higher ability sets, *“teachers who had direct experience of [ability set teaching] tended to hold more favourable attitudes towards it”* (Newbold, 1977 and Reid et al, 1982). This may be because pupils in lower ability classes tend to have more negative attitudes towards school and often exhibit poor behaviour in the classroom which makes them more difficult to teach (Hargreaves, 1967; Schwartz, 1981; Finley, 1984; Taylor, 1993). However, from the research seen in this study these opinions may have to change. It was seen from the findings here that teachers prefer to teach the lower ability sets due to the higher sense of satisfaction that this gives. This idea could be argued due to the low number of participants in the study.

Another consideration that must be taken when looking into behaviour in the classroom is the social economic area that the school is situated in. Many teachers' interviews discussed the problems that being in a deprived area caused in their

classrooms, they also discussed their work in other schools in more affluent areas where behaviour tended to be better. This is backed up by the research of Wilkinson (2005) who suggests that deprived areas have many additional problems including a lack of funding for schools, this problem can lead to less staff in schools which can develop into higher workloads, which have already been seen to have a detrimental effects on teaching in the classroom from the research above (Weinger et al, 2004).

To conclude there are a lot of other reasons why behaviour in the classroom environment may be affected, not only whether the class is set by ability or mixed. Many external influences can contribute to the behaviour in the classroom environment.

Implications for future practice

The results of this study show that when considering the way in which mathematics classes are setted that both ability setting and mixed ability setting has its advantages and disadvantages, it is important for schools to look at the students they have in-order to see what the best approach would be. However, what this study has also shown is the importance of looking at both the social economic area of the school that they are working in when looking into behaviour. What this means is that teachers must consider where the school is before condemning the behaviour in their classes. Teachers in the future should also consider their enthusiasm towards their classes. Although this research concluded that even with lower ability students' teachers remained enthusiastic, the findings from many other researchers suggest the opposite

therefore it is more important than ever to keep the enthusiasm for all classes they have.

Conclusion

The overall conclusions of this study are that behaviour is student dependent, each case should be taken on an individual basis, whether students are in mixed ability mathematics classes or ability classes. Although the way in which students are setted may influence student behaviour, there are many other contributing factors that need to be considered. The overall answer to the original question cannot be defined with a simple yes or no answer, both ways of setting mathematics students have their merits. Students can be affected by being in ability set classes both academically and mentally. However, students of mixed ability sets can also suffer in the wrong circumstances.

Appendix 1

Student Questionnaires Number.....

Gender

Year.....

Age.....

Class.....

Place a tick in the most appropriate column.

1 = Strongly disagree

2 = Disagree

3 = Neither agree or disagree

4 = Agree

5 = Strongly Agree

Statement	1	2	3	4	5
1) The behaviour of other children in my maths class is generally good					
2) My behaviour in my maths class affects the learning of all the other students					
3) When other students misbehave in my maths class I struggle to get the best out of the lesson					
4) Behaviour is better in my English class than my maths class					
5) I enjoy my maths lessons					
6) My teacher is always fair when awarding positive and negative points in my maths class					
7) I try my hardest to earn as many positive points in maths as I can					
8) I try my hardest to avoid getting negative point in maths					
9) My maths teacher is enthusiastic when they are teaching me					
10) I understand the system that is in place for negative behaviour, (verbal warning, C1, C2, Removal)					

4. RECORD OF INDEPENDENT PROJECT SUPPORT RECEIVED

Trainee: Sean Webber IP Supervisor: Karen Nanson

TIME LINE	Date of support	Nature of support / Summary of Discussion / Suggestions for a way forward	Action by Tutor	Action by trainee	Time used
1	21/10/19	Proposal			20
2	6/12/19	Literature review			30
3	2/2/20	Methodology – to talk about the contents and method of study			20

Signed: SEAN WEBBER (Trainee)
 (IP Tutor)

.....
 Your IP Tutor will be issued with this form to help account for your support over the year. Please assist them in ensuring the form is kept 'up to date' and that you have, indeed, received the support indicated upon it. Your IP Tutor will submit this form to the IP Module Co-ordinator when you submit your IP for assessment.

This record must be submitted with the Independent Project signed by both trainee and IP Supervisor

Application for Ethical Approval: For all applications for ethical approval (staff/PGR/Masters/UG)

This form should be used by ALL members of the University including undergraduate students, postgraduate research and postgraduate taught students, staff and those in visiting or emeritus roles who wish to undertake research involving human participants under the name of the University of Chichester. You do not need to complete this form if your research does not involve human participants directly or indirectly (e.g. observation studies) (see section 4.1 of the Research Ethics Policy (REP) for more information), however, you are expected to work within the Research Ethics Policy and Researcher Code of Conduct. The University does not conduct research on animals. If your proposed project involves animals in any way please seek advice from the Research Office before proceeding. Researchers wishing to use tissue cultures in their research should contact the Research Office in the first instance. Researchers should consider the provenance of tissue samples/cultures/cell-lines and associated growth media (or similar) and whether immortalised and/or animal-free alternatives are available.

THIS FORM MUST BE COMPLETED AND APPROVED by the relevant person(s) and if categorised as Category B it must be approved by the Research Ethics Committee (REC) prior to commencement of research. Full guidance on the Application process can be found in the body and appendices of the Research Ethics Policy.

REQUIRED DOCUMENTATION Each Application must be submitted alongside relevant consent forms, information letters/sheets, and debriefing sheets. This documentation should be version numbered and dated.

Categorisation of applications for ethical approval

Category A projects are less likely to involve participants from vulnerable groups (e.g. children, or persons with disabilities) and/or involve sensitive issues or areas/activities that entail a level of risk of distress or harm to participants or researchers. They only need to be approved by your supervisor and do not need to be considered by the Research Ethics Committee. The Research Ethics Policy provides further guidance on categorisation and areas of risk.

Category A+ for specific cases of withholding information / intentional deceit as occurs in single blind or double blind trials (as described above), where the only reason for identifying the project as a Category B is the withholding of information / intentional deceit. If there is any other aspect of the study that would lead to a Category B categorisation (e.g. the study involves a vulnerable group such as children, people with a disability, or those with a mental health problem, who are not persons with whom the applicant normally works: see clause 10.1.5 of Research Ethics Policy) then the exception does not apply and the application for ethical approval is classified as Category B and treated accordingly. The application would be approved by the line manager/supervisor (as with Category A applications) and also by an independent scrutiniser drawn from a pool of experienced researchers within the Institute/Department approved by its Head/Director. They do not need to be considered by the Research Ethics Committee. This would apply to category A+ applications from undergraduate students as well as staff and postgraduates.

Category B projects need to be considered by the Research Ethics Committee. The process of approval can take several weeks or longer depending on the number of applications being considered at any one time and the resolution of any issues that are raised by the Committee. It is fairly common for applications to be returned for further amendments prior to approval. The Committee expects applications from students to be of the same quality as those from staff. A helpful way to consider this position is to consider the research project from the point of view of the research participant.

Undergraduate or taught postgraduate student applicants: Your tutors and programme team will be able to advise you on how and when to complete this form. Your project supervisor is responsible for categorising your application as Category A, A+ or Category B and for authorising it.

Communications relating to Category B applications should be between the supervisor and the clerk to the Research Ethics Committee. The student should not contact the clerk directly.

The completed form will be kept for a period of five years after approval.

Postgraduate research students: Your PhD supervisor is responsible for categorising your application as Category A, A+ or Category B and for authorising it.

Academic Staff: Your line manager is responsible for categorising your application as Category A, A+ or Category B and for authorising it.

Emeritus or Visiting roles: The Head of Department of the area to which you are linked is responsible for categorising your application as Category A, A+ or Category B and for authorising it.

[this is a detachable front sheet, the form begins on the next page]

Section A: Basic Information

A1: Title of study:	Does ability setting children in mathematics effect behaviour		
A2: Name of Applicant: (in collaborative projects, just name the lead applicant)	Sean Webber		
A3: Position of Applicant (e.g. UG/Masters/PGR student, academic)	UG		
A4: Programme of study: (for UG or taught Masters students only)	BSC (Hons) Mathematics and Teaching KS2/3		
A5: Department of Applicant:	IEHSS		
A6: Checklist to ensure application is complete. Have you prepared the following documents to accompany your application for ethical approval, please tick the appropriate column for each of the following:			
Document			
Confirmation of Ethical Approval of any other organisation (e.g. NHS, MoD, National Offender Management Service)			
Recruitment information / advertisement (e.g. draft text for email/ poster/social media/letter)			
Information sheet for participants			
Information sheet for carers/guardians			
Information sheet/letter for gatekeepers e.g. Head teacher, teacher, coach			
Consent form for participants			
Assent form for younger children			

Documentation relating to the permission of third parties other than the participant, guardian, carer or gatekeeper (e.g. external body whose permission is required)			
Medical questionnaire / Health screening questionnaire			
Secondary information sheet for projects involving intentional deceit/withholding information			
Secondary consent form for projects involving intentional deceit/withholding information			
Debrief sheet to give to participants after they have participated			
Statements about completeness of the application			
For research involving under 18s or vulnerable groups, where necessary, a statement has been included on all information sheets that the investigators have passed appropriate Disclosure and Barring Service ¹ checks			
I can confirm that the relevant documents listed above make use of document references including date and version number			
I can confirm that I have proof read my application for ethical approval and associated documents to minimise typographical and grammatical errors			

Declaration of the applicant:

I confirm my responsibility to deliver the research project in accordance with the University of Chichester's policies and procedures, which include the University's '*Financial Regulations*', '*Research Ethics Policy*', '*Electronic Information Security Policy*' and '*Privacy Standard*' and, where externally funded, with the terms and conditions of the research funder.

In signing this research ethics application form I am also confirming that:

- The research study must not begin until ethical approval has been granted.
- The form is accurate to the best of my knowledge and belief.
- There is no potential material interest that may, or may appear to, impair the independence and objectivity of researchers conducting this project.
- Subject to the research being approved, I undertake to adhere to the project protocol without deviation (unless by specific and prior agreement) and to comply with any conditions set out in the letter from the University ethics reviewers notifying me of this.
- I undertake to inform the ethics reviewers of significant changes to the protocol (by contacting the clerk to the Research Ethics Committee (research@chi.ac.uk) in the first instance).
- I understand that the project, including research records and data, may be subject to inspection for audit purposes, if required in future, in keeping with the University's Privacy Standard.
- I understand that personal data about me as a researcher in this form will be held by those involved in the ethics review procedure (e.g. the Research Ethics Committee and its officers and/or ethics reviewers) for five years after approval and that this will be managed according to Data Protection Act principles.
- I understand that all conditions apply to any co-applicants and researchers involved in the study, and that it is my responsibility to ensure that they abide by them.
- For the Student Investigator: I understand my responsibilities to work within a set of safety, ethical and other guidelines as agreed in advance with my supervisor and understand that I must comply with the University's regulations and any other applicable code of ethics at all times.

¹ Working with under 18's or other vulnerable groups may require a Disclosure and Barring Service Check. Contact HR@chi.ac.uk if you are not sure whether you have an up to date and relevant DBS check or if you require more information. Do note that a DBS check may take several weeks to obtain.

Title of study: Does putting students into ability setting in mathematics effect classroom behaviour in mathematics?

Name of applicant: Sean Webber

Signature of Applicant: SEAN WEBBER Date:

.....

Section B: Authoriser assessment and approval

Where Applicants are students (undergraduate or postgraduate) supervisors should authorise this form; where applicants are staff members their line manager (or nominated signatory) should authorise this form.

B1: Name of Authoriser:	Karen Nanson
B2: Position of Authoriser: (e.g. supervisor, line manager)	Programme Co-ordinator
<p>AUTHORISER: Please categorise the application (A, A+ or B) ensure that the application form and all of the required documentation are complete before signing this application. Authoriser assessment: (tick as appropriate – see Section 10 of the Research Ethics Policy)</p>	
<p>Category A: Proceed with the research project. <i>Undergraduate and Postgraduate Taught Masters applications:</i> Form and documentation retained at Department level. <i>Research Masters, PhD and staff applications:</i> Form and documentation forwarded to the Research Office research@chi.ac.uk</p>	
<p>Category A+: (for studies where information is withheld/there is an element of deceit or similar see Appendix 13) Proceed with the research project. <i>Undergraduate and Postgraduate Taught Masters applications:</i> Form and documentation retained at Department level. <i>Research Masters, PhD and staff applications:</i> Form and documentation forwarded to the Research Office research@chi.ac.uk</p>	X
<p>Category B: Submit to the Ethical Approval Sub-group for consideration. research@chi.ac.uk</p> <p>Proceed only when approval granted by the Chair of the Research Ethics Committee</p>	
<p>Authoriser, please provide a comment on your assessment of the research project and for those projects involving vulnerable groups that you are authorising as Category A please justify this classification in the box below. As a further point, do make appropriate reference to any other codes of practice in your discipline particularly if you think that the proposed research may be in tension with those codes.</p> <p>For Category A+: the application would be approved by the line manager/supervisor (as with Category A applications) and also by an independent scrutiniser drawn from a pool of experienced researchers within the Institute/Department approved by its Head/Director</p>	
<p><i>Comment:</i></p>	

Authoriser's declaration:

- I have read the Research Ethics Policy and this has informed my judgement as to the category of assessment of this application.
- I understand that the applicant has taken account of the Research Ethics Policy and other relevant University policies in preparing this application.
- For Supervisors: I understand my responsibilities as supervisor, and will ensure, to the best of my abilities, that the student investigator abides by the University's Research Ethics Policy at all times.

Authoriser, please complete this table making it clear which version of the application form you are approving:

Version of the form (e.g. original version/ amended version following REC sub-group comments)	Signature of authoriser	Date

For Category A+ independent scrutiniser must also sign as authoriser.

For RO use: IF CATEGORY B: Signature of the Chair of the Research Ethics Committee.

Signature:

Date:

.....

Please note that the Research Office will retain all applications for ethical approval for 5 years after the research project has ended as stated in the University's Privacy Standard

SECTION C: Ethical Review Questions

C1. Does the study involve human participants?

Yes

Participants in research are taken to include all those involved in the research activity either directly or indirectly and either passively, such as when being observed part of an educational context, or actively, such as when taking part in an interview procedure.

NB: the University does not conduct research on animals. If your proposed project involves animals in any way (including animal tissue) please seek advice from the Research Office before proceeding.

C2. Why should this research study be undertaken?

Brief description of purpose of study/rationale

In the current schooling system some schools maintain that ability grouping students is better for their academic achievement as it allows teachers to focus learning to suit specific needs, however it can be argued that this can cause problems when it comes to behaviour management of those classes. My study will be looking into this effect to see if this is the cause of the issue of whether there are other external factors that can/could effect the students inside the mathematics classroom environment.

C3a. What are you planning to do?

Provide a description of the methodology for the proposed research, including proposed method and duration of data collection, tasks assigned to participants of the research and the proposed method and duration of data analysis. If the proposed research makes use of pre-established and generally accepted techniques, e.g. established laboratory protocols, validated questionnaires, please refer to this in your answer to this question. (Do not exceed 500 words). If it is helpful for the panel to receive further documentation describing the methodology then please append this to your application and make specific reference to it in box 3a below. For category B applications please include the data collection sheet as an appendix

To collect the data I will be conducting interviews with teachers and pupils in order to gauge their thoughts and feelings on the behaviour in their classrooms. I will also be looking at the school's behaviour policy to see how they deal with behaviour in general and how they keep records of persistent offenders. By looking at this data I can see if there is a specific concentration of these pupils in certain sets (specifically looking at mathematics classes). After this I will go and observe particular classes of interest and take field notes of my observations.

C3b. When are you planning to do it?

Please enter the anticipated start and end dates of your study (Consider at which point you will be involving human participants, this would typically be in the data collection/information gathering phase of the project but may be earlier):

I will start my study on 6th January 2020 and finish week beginning 16th March, Interview will be conducted week beginning 3rd February. Participants will be allowed to pull out of the research up until the 3rd March, If additional participants are needed, for example if too many pull out, further interview will take place week beginning 2nd March with a final pull out date of 20th March.

C3c. Is this research externally funded?

No

If, the answer yes, please name the research funder(s) here:

N/A

C4. Where will the research be undertaken?

Briefly describe the location of the study, provide details of any special facilities to be used and any factors relating to the study site/location that might give rise to additional risk of harm or distress to participants or members of the research team together with measures taken to minimise and manage such risks:

In a medium size academy school in a socially deprived area of West Sussex

C5. Who are the participants?

Please indicate the number of participants in each of the groups in the table below. If the precise number of participants is not known then please make an estimate. Please enter '0' in the 'Numbers in study' column for those groups that are not included in your study. Please note that the examples provided of different sorts of vulnerability are not an exhaustive list.

Participant	N u m b e r s i n s t u d y
Adults with no known² health or social problems i.e. not in a vulnerable group:	5
Children aged 16-17³ with no known³ health or social problems:	0
Children under 16 years of age with no known³ health or social problems:	5 8
<p>Adults who would be considered as vulnerable e.g. those in care, with learning difficulties, a disability, homeless, English as a second language, service users of mental health services, with reduced mental capacity⁴</p> <p>Identify reason for being classed as vulnerable group and indicate 'numbers in study' in next column adjacent to each reason (expand the form as necessary):</p> <p>.....</p> <p>.....</p>	0
Children (aged <18) who would be considered as particularly vulnerable e.g. those in care, with learning difficulties, disability, English as a second language	E A L , S

² Known to the researcher

³ A summary of UK definition of 'Child' : http://www.nspcc.org.uk/Inform/research/briefings/definition_of_a_child_wda59396.html

⁴ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224660/Mental_Capacity_Act_code_of_practice.pdf

Identify reason for being classed as vulnerable group and indicate 'numbers in study' in next column adjacent to each reason (expand the form as necessary):	/ S E N D
Other participants not covered by the categories listed above (please list): <i>List other categories here:</i>	0

C6a. Is there something about the context and/or setting which means that the potential risk of harm/distress to participants or research is lower than might be expected?

Answer: No

Consider if the study is part of routine activity which involves persons with whom you normally work in a typical work context e.g. Teachers working with children in a classroom setting, researchers in the performing arts working with performers, sports coaches working with athletes/players or research involving students in an academic setting.

Optional: Further information to justify answer to 6a

C6b. Are there any conflicts of interests which need to be considered and addressed?
 (For example, does the research involve students whom you teach, colleagues, fellow students, family members? Do the funders, researchers, participants or others involved in the research have any vested interest in achieving a particular outcome? See section 9 of the Research Ethics Policy (REP))

Answer: No

If conflicts of interest are envisaged, indicate how they have been addressed:

Some of the sample are children that I have worked with over the last few weeks. I will be conducting the interviews in a group conditions to ensure that children feel as comfortable to open up as honestly as they can

C7. How will potential participants in the study be identified, approached and recruited?

Please include details of:

- **Basis for selection of participants in the study: e.g. participants must be clinically obese adults; participants must be social workers over the age of 50; participants must have achieved Grade 5 in an appropriate musical instrument**
- **Any criteria for exclusions (e.g. participants declaring a heart problem will be excluded)**
- **How the selection criteria will be applied e.g. Health questionnaire completed prior to joining the study**

The means by which the participants will be recruited (e.g. through an advert, through a school, through a sports club), please be specific about the medium of the advertisement/recruitment information (e.g. poster, email, website, social media, word of mouth) and mention any third parties who may be involved in supporting the recruitment.

Selected based on Convenience sampling based on data from the school, this is so I can get a full picture of the behaviour over the whole of the mathematics department.

C8. Will any payment, gifts, rewards or inducements be offered to participants to take part in the study? See section 11 of the REP.

Answer: No

Please provide brief details and a justification:

C9a. Is the process of the study and/or its results likely to produce distress, anxiety or harm in the participants even if this would be what they would normally experience in your work with them?

See section 5 of the REP.

Answer: Yes

If you answered Yes to 9a, please answer 9b below:

C9b. Is the process of the study and/or its results likely to produce distress or anxiety in the participants beyond what they would normally experience in your work with them?

Answer: Yes/No

If yes this Application must be categorised as 'B'

Please provide details:

It may cause them stress as they may have mathematical anxiety

C9c. What steps will you take to deal with any distress or anxiety produced?

E.g. have a relevant professional on-hand to support distressed/anxious participants. Careful signposting to counselling or other relevant professional services. Other follow-up support.

If anyone has concerns, then they need to be sent to nurse/safeguarding

C9d. What is the potential for benefit to research participants, if any?

E.g. Participants may gain an increased awareness of some issue or some aspect of themselves.

none

C10a. Will the study involve withholding information or misleading participants as part of its methodology? (Please refer to sections 6.2 and 10 of the REP for further guidance)

Answer: No

Please provide details if this has not already been explained in section 3a:

C10b. Do you envisage that withholding information or misleading participants in this way will lead to any anxiety, distress or harm?

Answer: No

Please justify your answer to 10b:

It is the University Research Ethics Policy that all projects with the exception of double blind placebo trials (or similar) will be categorise as Category B. Double blind placebo trails (or similar) may be categorised as Category A+.

C11a. Does your proposal raise other ethical issues apart from the potential for distress, anxiety, or harm?

Answer: No

C11b. If your answer to C11a. was 'yes', please briefly describe those ethical issues and how you intend to mitigate them and/or manage them in the proposed study, otherwise jump to C11c.

C11c Does your proposed study give rise to any potential risk of harm or distress to yourself or other members of the research team? OR is there any risk that you could find yourself in a vulnerable position as you carry out your study.

Answer: Yes/No

If you answer 'yes' to either of these points please explain briefly what the risks are and what steps you are taking in order to minimise and manage those risks. For example does your study involve you in 1-1 interviews in a private setting that might suggest precautions need to be taken relating to lone-working (See section 9 of the REP), Have you considered the likelihood of a participant(s) disclosing

sensitive information to you about illegal or harmful behaviour and what actions you would take in such circumstances?

The research will be with another member of staff, interviews will be taken with a member of staff

C12. Will informed consent of the participants be obtained and if so, how?

Answer: Yes/No

See section 6 of the REP to help you answer this question. Section 6.3.1 covers research that involves observing behaviour in a public place where gaining informed consent may not be practical or feasible.

When and how will informed consent be obtained? Will it be written or oral consent bearing mind that oral consent will not be considered adequate other than in exceptional circumstances and must be appropriately justified in your application? NB: Ethical approval should, as a principle, be sought before research participants are approached.

A mixture of assent and consent dependent on students use, above 16 and below 16

C13. Is there anyone whose permission should be sought in order to conduct your study? E.g. Head teacher of a school, parents/guardians of child participants.

Answer: Yes

When and how will informed consent be obtained and from whom? Will it be written or oral consent bearing mind that oral consent will not be considered adequate other than in exceptional circumstances and must be appropriately justified in your application? If you are seeking to gain 'loco parentis' consent from a school rather than seeking individual parental consent please describe your reasoning.

Head teacher – this will be obtained with written consent

C14. Do you need to seek the permission of any other organisations, individuals or groups other than outlined in section 13? E.g. the Research Ethics Committee of partner or participating organisations. Organisations like the NHS and the Prison Service have specific systems for granting ethical approval for research.

Answer: No

Please note that all applications must go through the University of Chichester Application for Ethical Approval process and that they must meet the Research Ethics Policy (REP) requirements. Other prior approval will be taken into account but will not in itself be sufficient to gain University Research Ethics Approval. Each application must normally be accompanied by evidence (e.g. formal statement from the appropriate Ethics Committee) confirming approval by the external body (and any concerns/issues identified). In cases where an external body requires prior approval from the University Research Ethics Policy (such as some NHS work) the Research Ethics Committee (REC) may grant in principle approval pending written confirmation of ethical approval by the external body.

Please describe the permission that is required and how you will be seeking that permission: Please attach any relevant documentation e.g. letter, that relates to the seeking of the relevant permissions.

C15. It is normally required that a participant's data is treated confidentiality and stored securely at the outset of, during and after the research study. Will this be the case?

How long will data be stored before being destroyed?

Answer: Yes

If the answer is 'yes' please describe how you will be maintaining the confidentiality of participants' data. If the answer is 'no' please justify the exceptional circumstances that mean that confidentiality will not be guaranteed. See section 7 of the REP.

Please make reference to measures you are taking to ensure security of data from the point of data collection, transfer from notebooks/voice recorders etc., onto secure devices, to the point of analysis, sharing and final storage. If you are planning to store sensitive data on portable devices or media, you should only store such data if there is an immediate need and should remove these data when this immediate need no longer exists. All sensitive data stored on portable devices or media must be strongly encrypted greatly reducing the risk of the data falling into the wrong hands if the device or media is stolen. Actions should be in accordance with the University's Electronic Information Security Policy and Privacy Standard (please also refer to Section 9 of the University of Chichester's Data Protection Guidance for Staff). Signed consent forms should be stored in a locked cabinet for a period of 5 years.

Please provide details:

All data will be placed on a separate encrypted memory stick

C16. It is normally required that the anonymity of participants is maintained and/or that an individual's responses are not linked with their identity. Will this be the case?

Answer: Yes

If the answer is 'yes' please describe how you will be maintaining the anonymity of participants. If the answer is 'no' please justify the circumstances that mean that anonymity will not be guaranteed. See section 7 of the REP. NB: in group studies it is likely that each individual in the group will be aware that others in the group are participating in the study – they are therefore not anonymous to each other. However, their identity should not normally be associated with their individual responses. In some studies individual participants may not want their identity known to other participants and the study must be designed and undertaken accordingly.

Please provide details:

Each student will be assigned a number by the class teacher, that I will not know, they will place there number onto their interview sheet without my knowledge

C17. Will participants have a right to comment or veto material you produce about them?

Answer: Yes

Please give details and if your answer is 'no' then please provide a justification.

Anonymous reporting

C18. Does the project involve the use of or generation/creation of audio, audio visual or electronic material (e.g. Dictaphone recording, video recording) directly relating to the participants?

Answer: No

If yes, please describe how the collection and storage of this will be managed bearing in mind data protection, confidentiality and anonymity issues (see section 7 of the REP). If you are planning to store sensitive data on portable devices or media, you should only store such data if there is an immediate need and should remove these data when this immediate need no longer exists. All sensitive data stored on portable devices or media must be strongly encrypted greatly reducing the risk of the data falling into the wrong hands if the device or media is stolen

C19. How will the participants be debriefed?

It is expected that wherever possible all participants will receive some form of debriefing. This might be a verbal debriefing or a written debriefing depending on the context of the study. Debriefing provides an opportunity to remind participants of the procedures and outcomes of the research, and to provide further assurances on areas such as confidentiality, anonymity, and retention of data.

Projects that intentionally withhold information or deceive as part of their methodology must include a written debrief sheet. (Please refer to sections 6.1 and 6.2 of the REP for further guidance)

A document that contains information about 'what happens next' will be provided for the participants which they will need to sign to show they have understood what I will now do with the information.

C20a. Might the research entail a higher than normal risk of damage to the reputation of the University, since it will be undertaken under its auspices? *(e.g. research with a country with questionable human rights, research with a tobacco company. See section 9.3 of the REP). If a research partnership has been established with an industry partner please ensure that the University is not linked to claims made by that company regarding benefits of their products unless substantiated evidence of beneficial effects is available.*

Answer: No

C20b. If your answer to 20a was yes, please describe the potential risk to the University's reputation and how this risk will be mitigated. If no, please jump to C20c.

C20c. Does the research concern groups or materials that might be construed as extremist, security sensitive or terrorist?

Answer: No

If 'Yes' please describe how you will manage the research so that it is not in breach of the Terrorism Act (2006) which outlaws the dissemination of records, statements and other documents that can be interpreted as promoting or endorsing terrorist acts. For example, relevant documents, records, information and data pertaining to the research can be stored on a secure University server. Contact the Head of Research in the first instance if you are unsure as to how to proceed.

*If you answered **Yes** to question C20c then please complete the additional pro-forma available from the Research Ethics Moodle: **Approval to undertake research concerning groups or materials that might be construed as extremist, security sensitive or terrorist.** Please append the completed form to this application.*

C20d. Does your research fit into any of the following security-sensitive categories? If so, please indicate which:

-
- i. Commissioned by the military: No
 - ii. Commissioned under an EU security call: No
 - iii. Involve the acquisition of security clearances: No

If you answered yes to any of the above please provide further information

C21a. Will your results be available in the public arena? (e.g. publication in journals, books, shown or performed in a public space, presented at a conference, internet publication and placing a dissertation in the library) see *section 8 of the REP*.

Answer: Yes

If yes, please provide brief details:

NB: Please note that if participants wish to exercise their right to withdraw or request erasure of their personal data following collection and analysis this may not be possible having regard to permitted exemptions for research under data protection legislation i.e. where it would seriously impair the achievement of the research objectives. Notwithstanding the above, data subjects must still be advised of their rights to object in the information sheet, which can only be overridden if the "research is necessary for a task carried out for reasons of public interest.

Chi prints dissertation portal – which is only available to chi students and staff

C21b. Will your research data be made available in the public arena?

Certain research funding bodies require that research data is made Open Access i.e. freely available to the public. The University has a [Research Data Policy](#) that outlines the expectations and requirements for researchers at the University. Contact the Director of Research in the first instance if you are unsure as to how to proceed.

Answer: No

If yes, please provide brief details as to how the data will be prepared for public access including an overview of the meta-data that will accompany published data sets. Please also confirm that your intentions with respect to making data open access are clearly communicated to participants so that they can provide informed consent:

C22. Are there any additional comments or information you consider relevant, or any additional information that you require from the Committee?

no

[end of form]

Reference List

Balaji, G. (2017). Classroom behaviour of children – a study. Available at: <http://ijics.com/gallery/18-399-ijire-december.pdf> (accessed 22/10/19)

Boaler, J., Wiliam, D. and Brown, M. (2000) Students' experiences of ability grouping-disaffection, polarisation and the construction of failure. *British educational research journal*, 26(5), pp.631-648.

Boaler, J. (2009). *The elephant in the classroom: Helping children learn and love maths*. San Fransisco, Viking penguin.

Boaler, J. (2013). Ability and Mathematics: the mindset revolution that is reshaping education, *FORUM*, 55(1), pp.143-152

Boaler, J. (2016). *Mathematical Mindsets*. San Francisco: Jossey-Bass

Butt, G. and Lance, A., (2005). Secondary teacher workload and job satisfaction: do successful strategies for change exist?. *Educational Management Administration & Leadership*, 33(4), pp.401-422.

Chambers, C. and Timlin, R. (2019). *Teaching Mathematics in the Secondary School*. 3rd edn. London: SAGE Publications Ltd.

Creswell, J.W, (2002). *Educational research: Planning, conducting, and evaluating quantitative* (pp. 146-166). Upper Saddle River, NJ: Prentice Hall.

Crone, D.A., Hawken, L.S. and Horner, R.H. (2010). *Responding to problem behaviour in schools: The behaviour education program*. Guilford Press.

Drury, H. (2018). *Oxford Teaching Guides How to Teach Mathematics For Mastery*. Oxford: Oxford University Press.

Easthope, C. and Easthope, G. (2000). Intensification, extension and complexity of teachers' workload. *British Journal of Sociology of Education*, 21(1), pp.43-58.

Finley, M.K. (1984). Teachers and tracking in a comprehensive high school. *Sociology of education*, pp.233-243.

Green, J.C., J. Caracelli, and WF Graham, (1989). *Toward a conceptual framework for mixed-method evaluation designs*, pp.225-274.

Gross, R. (2015). *Psychology: The science of mind and behaviour 7th edition*. Hodder Education.

Go4Schools. (2020). *Behaviour point / All school / TLA* available from: <https://www.go4schools.com/> (accessed 05/05/20)

Hallam, S. and Deathe, K. (2002). Ability Grouping: year group differences in self-concept and attitudes of secondary school pupils. *Westminster Studies in Education*, 25(1), pp.7-17.

Hallam, S. and Ireson, J. (2003). Secondary school teachers' attitudes towards and beliefs about ability grouping. *British Journal of Educational Psychology*, 73(3), pp.343-356.

Hargreaves, D.H. (1967). *Social relations in a secondary school* (London, Tinling). *Hargreaves Social Relations in a Secondary School 1967*.

Hendrick, C. and Macpherson, R. (2017). *What Does This Look Like in the Classroom*. Woodbridge: John Catt Publications Ltd.

Hodgen, J. and Marks, R. (2013). *The Employment Equation: Why our young people need more maths for today's jobs*.

Kirkman, B.L., Rosen, B., Gibson, C.B., Tesluk, P.E. and McPherson, S.O. (2002). Five challenges to virtual team success: Lessons from Sabre, Inc. *Academy of Management Perspectives*, 16(3), pp.67-79.

Kyngäs, H., Kääriäinen, M. and Elo, S. (2020). The Trustworthiness of Content Analysis. In *The Application of Content Analysis in Nursing Science Research* (pp. 41-48). Springer, Cham.

Linchevski, L. and Kutscher, B. (1998). Tell me with whom you're learning, and I'll tell you how much you've learned: Mixed-ability versus same-ability grouping in mathematics. *Journal for Research in Mathematics Education*, pp.533-554.

McGill, R.M. (2013). *100 Ideas for Secondary Teachers: Outstanding Lessons*. A&C Black.

Mcmanus, M. (1995). *Troublesome Behaviour in the Classroom*. (2nd ed.). London: Routledge

Miller, D., (2000). Qualitative research course packet. *University of Nebraska-Lincoln*.

Mulhall, A. (2003). In the field: notes on observation in qualitative research. *Journal of advanced nursing*, 41(3), pp.306-313.

Muijs, D. and Reynolds, D. (2011). *Effective Teaching Evidence and Practice*. 3rd edn. London: SAGE Publications Ltd.

Nardi, E. and Steward, S. (2003). Is mathematics TIRED? A profile of quiet disaffection in the secondary mathematics classroom. *British Educational Research Journal*, 29(3), pp.345-366.

Newbold, D. (1977). *Ability grouping: the Banbury Enquiry*. Slough: National Foundation for Educational Research Publishing Company Ltd.

Nunes, T., Bryant, P., Sylva, K. and Barros, R. (2009). *Development of Maths Capabilities and Confidence in Primary School (Research Report DCSF-RR118)*. London: Department for Children, Schools and Families.

Plevin, R. (2018). *Take Control of the Noisy Classroom*. UK: Life Raft Media Ltd.

Reid, M.E., Clunies-Ross, L.R., Goacher, B., & Vile, D. (1982). *Mixed ability teaching: Problems and possibilities*. Windsor: NFER-Nelson.

Reis, S.M., Burns, D.E. and Renzulli, J.S. (1992). *Curriculum compacting*. National Research Center on the Gifted and Talented.

Reynolds, D. (1998). Schooling for literacy: A review of research on teacher effectiveness and school effectiveness and its implications for contemporary educational policies. *Educational Review*, 50(2), pp.147-162

Rickard, C. (2013). *Essential Primary Mathematics*. Berkshire: Open University Press

Rogers, B. (2015). *Classroom Behaviour a Practical Guide to Effective Teaching, Behaviour Management and Colleague Support*. 4th edn. London: SAGE Publications Ltd.

Rosenbaum, J.E. (1976). Making Inequality; the Hidden Curriculum of High School Tracking.

Sands, M. and Kerry, T. eds. (2020). *Mixed ability teaching*. Routledge.

Schwartz, F. (1981). Supporting or Subverting Learning: Peer Group Patterns in Four Tracked Schools 1. *Anthropology & Education Quarterly*, 12(2), pp.99-121.

Sedgwick, P. (2013). Convenience sampling. *Bmj*, 347, p.f6304.

Simms, V. (2016). Mathematical mindsets: unleashing students' potential through creative math, inspiring messages and innovative teaching.

Taylor, N. (1993). Ability grouping and its effect on pupil behaviour: A case study of a Midlands comprehensive school. *EDUCATION TODAY-LONDON-COLLEGE OF PRECEPTORS THEN COLLEGE OF TEACHERS-*, 43, pp.14-14.

The School Bus. Ofsted and behaviour management (unknown). Available at: <https://hub4leaders.co.uk/learning-hub/resources/ofsted-and-behaviour-management/ofsted-and-behaviour-management/> (accessed 14/10/2019)

Titheradge, D., Hayes, R., Longdon, B., Allen, K., Price, A., Hansford, L., Nye, E., Ukoumunne, O.C., Byford, S., Norwich, B. and Fletcher, M. (2019). Psychological distress among primary school teachers: a comparison with clinical and population samples. *Public health*, 166, pp.53-56.

Towers, E., Taylor, B., Tereshchenko, A. and Mazonod, A. (2020). 'The reality is complex': teachers' and school leaders' accounts and justifications of grouping practices in the English key stage 2 classroom. *Education 3-13*, 48(1), pp.22-36

Tran, B. (2019). The Nature of Research Methodologies. In *Advanced Methodologies and Technologies in Library Science, Information Management, and Scholarly Inquiry* (pp.552-563). IGI Global.

Weinger, M.B., Reddy, S.B. and Slagle, J.M. (2004). Multiple measures of anesthesia workload during teaching and nonteaching cases. *Anesthesia & Analgesia*, 98(5), pp.1419-1425.

William, D. and Bartholomew, H. (2004). It's not which school but which set you're in that matters: The influence of ability grouping practices on student progress in mathematics. *British Educational Research Journal*, 30(2), pp.27

Wilkinson, R.G. and Pickett, K.E. (2007). The problems of relative deprivation: why some societies do better than others. *Social science & medicine*, 65(9), pp.1965-1978.

Vergon, C. (2018). Ability grouping. Available at: <https://usedulaw.com/145-ability-grouping.html> (accessed 15/10/2019)

Verma, S., Sharma, D. and Larson, R.W. (2002). School stress in India: Effects on time and daily emotions. *International Journal of Behavioral Development*, 26(6), pp.500-508.

Yuan, X. (2012) 'How to deal with student misbehaviour in the classroom?', *Journal of educational and Developmental Psychology*, 2(1), pp143-150. doi:10.5539/jedp.v2n1p143.