

How do Mathematics learners at FE colleges describe their experiences of ability sets at secondary school?

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This paper investigates the impact of ability sets at secondary schools on post 16 resit Mathematics learners' long-term attitudes and learning apprehensions at FE colleges. In particular, I wished to study resit Mathematics learners' experience of ability sets. I also included interviews with Mathematics teachers from secondary schools and FE colleges to understand the situation better. I interviewed 16 resit Mathematics learners from different vocational areas using focus group interviews. To further assess and understand the problem, I arranged semi-structured interviews with Mathematics teachers from different secondary schools and the FE colleges. The results indicated that the way learners are treated in low ability sets creates apprehensions for them, including experiencing feelings of upset, shame, and inferiority. Adopting a growth mindset, I suggest that such learners might be termed slower developing. I recommend that learners in lower ability sets be treated fairly and provide an equal chance to progress.

Keywords: ability sets; steaming; low-attainers; resit mathematics

Introduction

Resit Mathematics learners at Further Education (FE) colleges are usually considered 'lower-attaining' students. At the FE level, the 'low attainers' are the ones who did not achieve GCSE Mathematics at its benchmark grade of C/4. These are the learners commonly from the low ability sets from secondary schools (Francis et al. 2020). It is common in schools in England that learners are placed into different ability level groups or settings (Lopez, 2021). This distribution of learners into groups or sets is usually based on their prior attainment or special learning needs (Waterman-Smith, 2021). Regardless of the privilege of the National Curriculum for all (Department for Education England, 2016), the learners placed in low ability sets are taught according to the expectations of lower levels of GCSE examinations (Watson, 2021). Learners from low ability sets are also known to encounter prejudicial Mathematics learning experiences at school (Klusmann et al. 2021).

Problem statement

In secondary school, it appears that Mathematics anxiety is directly proportional to Mathematics performance. It reaches its maximum in year 11 because learners have to face GCSE exams (Watson, 2021). The learning behaviour in Mathematics, especially among school leaving age learners, is becoming a concern for the education providers and the government (Russell, 2014). Similarly, Luttenberger et al. (2018) also emphasized on continuous increase in Mathematics learning behaviour issues at secondary school level. These behaviours become even more challenging at the FE college level once the learners fail their GCSE Mathematics at school leaving age

(Anderson & Peart, 2016). Then these learners are expected to prepare and resit GCSE Mathematics exam or equivalent Mathematics qualification with their chosen vocational course at FE college.

Greany et al. (2016) criticised the England's emerging decline in learners' positive behaviour towards learning and achieving Mathematics at school and then FE college level. Additionally, the resit GCSE Mathematics pass rate is 19%, stated in the Ofsted annual report 2018, which is low (Ryan, 2019). Thus, practical solutions are required to improve learners' behaviour and achievement in Mathematics besides minimising the impact of different apprehensions faced by Mathematics learners.

Ability sets

In England, schools' subject ability sets allocations are performed by classifying learners into groups. The ideology behind this classification is to separate learners according to their past performance in the subject to better support them. This classification is also known as subject streaming/ tracking of learners into different sets judged on their past subject performance (Sukhnandan & Lee 1998; Francis et al. 2020). In the US, 'tracking' is the word used to refer to streaming and setting of ability groups (Taylor et al. 2017). Although, mixed-ability classes are also the norm in France and Finland, primarily until 16 (Mazenod, 2017). In England, Taylor et al. (2017) identified that most secondary schools are reluctant to practice mixed attainment sets due to the fears of difficulty to handle and risk on overall school attainment outcome. Papachristou et al. (2022) highlighted that learners show more behaviour issues in low ability sets as compared to mixed ability settings. Additionally, in England, secondary school ability settings for Mathematics practice a most rigid way compared to other high-performing countries (Boylan & Povey, 2020).

Misallocations in 'Ability sets'

The focus of ability sets at secondary schools assumes that the ability to learn Mathematics varies from person to person. Mostly this ability setting is seen as determining a person's future achievement through an individual pace of understanding and learning Mathematics (Boylan & Povey, 2020). The proposed intention behind 'ability grouping' is to stream learners into the same ability level groups to meet their individual learning needs more effectively (Taylor et al. 2017). However, the OECD (2012) argued that setting students into ability sets should be avoided as it influences unfairly negatively on learners' long-term achievement.

Social inequality is also observed with an overrepresentation of learners from lower socio-economic backgrounds in low ability sets (Mazenod et al. 2019). Additionally, Connolly et al. (2019) identified that learners from lower social-economic backgrounds and different genders are more likely to be misallocated to both the lower set and upper set. It is commonly perceived that learners from lower ability sets are expected to perform least and are taught with a restricted curriculum by mostly less qualified or inexperienced teachers. As a result, it leads to a broader GCSE Mathematics grade variation among students from lower and higher ability sets (Boylan & Povey, 2020).

Mathematics anxiety in ability sets

The prejudicial classroom-based classification of learners into ability sets, particularly in English schools, limits learners' achievement and reduces fairness due to a fixed ability mindset (Boaler, 2013). Once these disadvantaged learners from low ability sets fail their GCSE Mathematics at their school leaving age, these low-attainers join a vocational course at FE Colleges with an obligatory GCSE Mathematics resit course. These low-attainers encounter limited, time-consuming, and complicated progression opportunities compared to the high-attainers from higher ability sets (Velthuis et al. 2018; Lupton et al. 2021). Thus, Johnston-Wilder et al. (2020) argued that it instigates Mathematics anxiety in low-attainers, resulting in an enduring detrimental impact on these learners' well-being and progression and limiting their individual contribution to broader society.

Research questions

My study remained focused on following questions to elaborate my understanding of low attaining learners' experience of ability sets at secondary school. These questions throughout this study enabled me to remain focused on the long-term impact of ability sets on low attaining learners of Mathematics.

How did learners feel about learning in Mathematics ability sets?

Did learning experiences in ability sets influence Mathematics understanding, attitudes, and achievement?

Research methodology

I used qualitative research methods to gain a deeper insight into the situation from the learners' own experiences. The interpretative paradigm of humanistic approach supported this study to gain detailed learners' perspectives through their personal, collaborative, and circumstantial dimensions (Angus et al. 2015). I organised focus group interviews for the FE college learners and semi-structured interviews for the Mathematics teachers.

Sampling

I purposively selected learners from the resit Mathematics course. I organised user-friendly, activity-based focus group interviews with resit learners to obtain detailed data from learners compared to individual interviews. I used three two-staged focus group interviews with different participants. This strategy helped my study gain better insight into the problem. To select Mathematics teachers, I used convenience sampling because the intention was to choose Mathematics teachers from different schools and the college. This study only required further discussion on learners' mathematics experiences from low ability sets with the mathematics teachers. Mathematics teachers were inquired to affirm, reject, or some additional comments on the situation from their experienced viewpoints.

Discussion

I purposively selected learners from the resit Mathematics groups at FE college. These learners revealed that their experience within lower ability sets at secondary school was unfair. Shockingly, four out of five participants expressed that they hated

their Mathematics teachers at secondary school. Additionally, they said their teachers were harsh, over strict, and did not know how to teach. They claimed that their Mathematics teachers themselves lacked confidence in teaching Mathematics. At times, their teachers were not prepared to teach and pass lesson time. Teachers used to distribute worksheets to learners without explaining the topic.

In discussion, learners described their overall Mathematics learning experience as frustrating and damaging at secondary school. Learners faced teachers with a lack of teaching and subject expertise in their Mathematics lessons. They expressed that most teachers were finding it hard to control classroom behaviours. The majority of learners experienced that most of the learners with them in Mathematics lessons did not want to learn and mess around during lesson time. The nonserious classroom environment made it nearly impossible to concentrate and learn, especially for those few learners who wanted to learn and to pass their GCSE Mathematics. They further explained that often Mathematics teachers were not fully equipped and supported in controlling these behaviours. As a result, some motivated students also gave up like others in the class and felt attending Mathematics lessons was pointless and frustrating.

Learners also discussed that, for the most part, their teacher did not teach or explain the topic adequately. Still, the learners were expected to practice Mathematics quietly using worksheets during the lesson. These teachers did not care whether learners needed help or any actual learning in class time. Few learners added that some teachers had good subject knowledge but lacked teaching skills or might not want to teach us.

Mathematics teachers confirmed that schools usually concentrate more on high ability sets and achievements and tend to ignore low ability groups. The low ability sets are provided less chance to improve and are generally supplied with new, less experienced teachers or supply staff to cover the lessons.

This study also reviewed the impact of learning in Mathematics ability sets at secondary school and then in a resit Mathematics course at FE college. It found nearly all the learners described the resit Mathematics course as an unnecessary burden inflicted on them. At college, when low attainers resit the same Mathematics course, they feel it like a pointless burden with the demands of their chosen vocational course.

Conclusion

A general justification behind practising ability settings in schools is to provide different ability learners' with a favourable learning environment to cater to their learning needs. However, this learning arrangement should also support their psychological needs for their course progression. It should not only be a way to tag learners with fixed mind ability that lower set learners are not good enough to pass the course. The class learning environment should provide equal opportunities to every learner and is dependent on a combination of the teacher's subject knowledge and teaching skills (Kaiser & König, 2019; Klusmann et al. 2021).

The learning environment created by the teachers plays a significant role in learners' learning experience and resulting achievement. At FE college, learners' self-evaluation of their own abilities in learning Mathematics and their previous negative experiences contribute to their attitudes towards Mathematics learning and achievement. Festinger's (1957) cognitive dissonance theory argues that there is an internal strength inside everyone, which keeps control of all attitudes and beliefs and prevents disharmony (or dissonance).

Learners from different cultural backgrounds and personal circumstances may have different levels of dealing with dissonance and achieving harmony. There is also a need to improve learners' abilities with a growth mindset instead of a fixed mindset to avoid unfair allocation of learners into lower ability sets. They should be provided an equal chance of learning and should be motivated through fair learning opportunities. There should be set examples of promoting learners from lower sets to higher sets. Generally, regular support and commitment towards learning Mathematics can make anyone at least basic level numerate. Human cognitive and social capacities are not fixed (Yeager & Dweck, 2012). The Mathematics teachers' belief in their learners' abilities with learners' belief in their abilities play a vital role in learners' growth mindset. There should be high expectations sets for all, allowing everyone to access the entire curriculum, focus on current efforts and future attainments instead of past performance, and achievement should be set for all. Thus, there is a desperate need to work on the psychological impacts that may predict Mathematics levels of engagement and motivation across secondary and college levels.

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