

Title of research activity: The effectiveness of mixed ability groups.

Purpose: To gauge the effectiveness of mixed ability group tasks, with a focus on equity of participation.

Research question: When working in mixed ability groups do higher attaining pupils dominate while lower attaining pupils participate less?

Research dates: 3/2/2020 to 4/2/2020

Location: SchoolX

Introduction

The decision to look at the effectiveness of mixed ability group tasks was a collaborative decision made between the three researchers involved. It stood out as an area of interest due to its link to Donaldson's (2015) 12th pedagogical principle: "Good teaching and learning encourages collaboration". This principle describes the value of students having "the ability to function effectively as a member of a team". Group tasks are periodically utilised in the classroom as a method of learning and producing work. With the implementation of the new curriculum; increased collaboration between students is encouraged. For example, since the publication of "Successful Futures" (2015), many classrooms in SchoolX which traditionally would have had rows of individual tables have been rearranged into group tables in order to facilitate this move into more collaborative learning.

The issue of identifying whether mixed ability group work is effective interested me because it is something I'd become aware of during my own observations of lessons, and my own teaching experience. Previously, when students were required to work in groups there seemed to be issues in terms of participation. Inevitably some students would seem to be doing more of the work than others. My interest lies in attempting to identify reasons why this may occur and to develop and adopt methods of increasing student participation when working in groups. The research question looks at whether this inequity of participation can be linked to student's ability. Student ability in this case is their perceived academic capability based on prior attainment within subject specific assessments and the regular class teacher's formative assessments. Initial discussions between myself and my research partners regarding the expected outcomes of this study proposed that the higher ability child would indeed dominate whilst those of lower ability would participate less. The research question we devised reflects this hypothesis.

Research Context

In order to protect its anonymity, the school in which the research took place will be referred to as SchoolX. SchoolX is a mixed, 11-18, English medium, community secondary school. The school has a higher than average intake of pupils eligible for free school meals at 32.7%. The percentage of those with a special educational need is also higher than the national average at 35%. Around 70% of pupils are from a minority ethnic background and speak an additional language. At the time of the Estyn (2017) report there were 1,721 students enrolled, including 254 enrolled in the sixth form. Estyn rated the school as "Excellent" for current performance and 'Excellent' for prospects for improvement. Within SchoolX students are put

into sets based on their ability, however within these sets you still find that there can be a significant range of abilities.

Literature review

Mixed ability grouping is an educational issue that has witnessed a lot of debate in terms of how effective it is in raising the attainment of all students. For the purpose of this study the focus is aimed at mixed ability grouping on a smaller classroom scale rather than mixed ability classes/sets. Allport (1924) defines a group as any “aggregate consisting of two or more persons who are assembled to perform some task”.

Early studies by Allport (1924) “found that there was a distinct increase in the quantity and quality of individuals work when they were able to see and hear others working”. This finding was supported by further studies/observations conducted in the 1930’s such as those undertaken by Shaw (1932) who concluded that “individuals were more productive when they worked in groups than when they worked alone”. However, Allport’s conclusions were, in part, based on studies carried out in the early 1900s by Dr August Mayer. These studies participants consisted of “fourteen boys from the Volksschule of Wurzburg, Germany” and compared “the individual’s mental work in groups with his performance when working alone” (Allport 1924). The limited size of this study and the fact that the sample consisted of exclusively boys could mean that there are limitations in the interpretation of results. Allport himself states that groups in actual social settings “are far more complex in inter-relations of individuals than the experimental settings described”. The fact that these studies were undertaken in the early 1900s is also worth noting as conditions and attitudes towards education have changed since then and these findings may not be so relevant in a modern setting.

Dewey (1940) concluded that by interacting with others “children receive feedback on their activities, learn socially appropriate behaviour and understand what is involved in co-operating and working together”. This can be linked to Vygotsky’s (1978) zone of proximal development which looks at what a child can achieve individually and compares it to what the same child can achieve with guidance and encouragement from a partner. Group work allows this encouragement and guidance to come from the child’s peers. In mixed ability groups the ideal would be that the higher ability students use their knowledge and skills to increase the capability of the other children within the group. In contrast to Vygotsky, Jean Piaget believed that the “participation in an activity for which a child is not ready with a more knowledgeable partner leads mainly to imposing the partner’s views and will not affect the structure of the child’s actions” (Matusov & Hayes 2000). This idea of a lower ability child being overly influenced by the views of a higher ability peer becomes an issue when the content involves individual views and opinions. If the topic is of a more factual nature then this may become less of an issue as the learning is of a nature that cannot be contended.

Gillies and Ashman (2003: 56) have previously explored how “co-operative learning” can help to avoid “curriculum differentiation”. They summarise relevant research literature by stating that: “curriculum differentiation has no effect on average learning scores”; “High achieving students achieve better results in a system with tracking” and “low achieving students perform better in heterogeneous classes”. However, they do not describe the group compositions that were involved in these studies or the nature of the “curriculum differentiated” referred to. Nevertheless, Giles and Ashman (2003:60) do refer to a series of studies undertaken involving “440 to 810 students in 18 to 33 classes respectively”. These studies looked at the “effects of co-operative learning as a learning strategy” they also looked at this in relationship to the “differences in class composition”. One of the conclusions that they drew from these studies involves the complexity of determining the effects of co-operative learning. They conclude that

both “individual characteristics and social factors” influence the outcomes but “always in connection with the purpose, content and organizational context of the curriculum”. I anticipate that these overriding factors will also affect the outcomes of this study and indeed any study looking at the nature of group work or ‘co-operative’ work.

An advantage of students working in mixed ability groups recognised by Saaris (2019) is that “learners of all abilities are better served with more opportunities to discuss and share ideas.” Saaris also makes links to how mixed ability collaboration can help to challenge disparities between students created by racial and socioeconomic lines. They argue that such collaboration provides opportunities for students of “diverse socioeconomic and racial backgrounds to have access to academic talk that is all too often the exclusive purview of their wealthy peers.”

Methodology

The research took the form of three lesson studies. A lesson study is defined by Dudley (2014) as being “a highly specialised form of classroom action research focusing on the development of teacher practice knowledge.” Lewis and Hurd (2011: 2) describe 4 elements of a lesson study:

1. Studying the curriculum and identifying goals
2. Planning the research lesson
3. Conducting the research lesson
4. Reflection.

Within this research; each member of the research triad planned and taught one lesson whilst the other two observed and participated in the subsequent reflection. The focus on groupwork required the lessons planned to include at least one group task where student groups were chosen by the researcher, with the aid of the class teacher, prior to the lesson. In each of the lesson studies students were put into groups of 4-6 students; each group included a mix of students who had been identified as lower, medium and higher ability. This identification was made with the aid of the class teacher and was based on their own formative assessments and the students’ attainment in previous subject assessments. During the lesson observation the observers focused on three selected key students. Three key students were chosen for each lesson study (9 key students in total). These students were selected based on ability: lower, medium and higher. They were also invited to fill in a questionnaire immediately after the end of the lesson.

During the lesson studies, the two researchers observing acted as non-participant observers. We chose to use an adapted version of Ferre Leavers’ Leuven scale to look at the key students’ level of participation when working in their groups. The Leuven Scale is a “five-point scale that allows childcare practitioners to measure children’s ‘emotional well-being’ and ‘involvement’” (Cheqdin Childcare Software 2019). This scale was designed for use with early years but we deemed it applicable to secondary level within the scope of this research. For the purpose of this research we chose to focus on the scale of ‘involvement’ (See Appendix A.i). The scale looks at how engaged children are with an activity: it allows their involvement to be ranked from 1 (extremely low) to 5 (extremely high). However, the indicators involved in this scale do have a generalistic nature. For example, whether the participant is “motivated and challenged” can only be measured in the eyes of the observer, as such there is the risk of human error in their perception of the situation based on the false interpretation of a child’s actions. One other issue with the use of the Leuven scale is that it does not account for the

amount of time the child shows a certain level of engagement. For example, a child could be ranked as extremely engaged for the first 10 minutes of a lesson only to become less engaged from that point on. To try and account for this we have also included an additional comments section, as well as the scale, in order to provide additional information such as the consistency of the participants' engagement.

Immediately after the lesson studies, individual questionnaires were given to the three key students (See Appendix A.ii). The questions included were largely open ended and were designed to check the students' overall understanding of the lesson content, determine their opinion on working in groups and their thoughts on the overall experience. Four of the questions required the students to select a face on a scale that reflected their thoughts/opinions. Taber (2007) suggests that "scales should not have central points as it forces the respondent to make a decision about how they feel." As such, we ensured that the scales in our questionnaire did not have a central point and were even numbered. However, in retrospect, I realise that if a key student had genuinely had neutral feelings towards a question then this strategy would not allow for that to be expressed. Consequently, the chosen scale may not be fully representative of the student's thoughts.

We chose to use questionnaires to record the key students' reflections on the lesson as they allow the student to have more anonymity and a more personalised response. We considered conducting a group interview but disregarded this in favour of the questionnaires as we were interested in the key students' individual responses. Individual interviews would have also met this requirement but was also disregarded due to time constraints (we did not wish to keep students from their other lessons).

Reflections on the lessons were recorded using the typical lesson planning template provided by UWTSD. In particular these reflections were made in the 'Evaluation of the Learning Experience' section (See Appendix C.ii). In my case, these reflections were recorded after discussions between researchers which occurred immediately after the lesson.

Ethical Considerations

Prior to the undertaking of the research a full application for ethical approval form was completed and approved. Measures were taken to ensure that any research practices undertaken adhered to BERA (2018) Ethical Guidelines for Educational Research and UWTSD Research Ethics & Integrity Code of Practice.

Students were reminded of the voluntary nature of the project in their previous lessons and again at the beginning of the research lesson. Consent forms were sent home; these had to be signed by both the parents/carers and the student involved and returned in time for the delivery of the lesson (See Appendix A.iv). Along with these consent letters parents and participants were also provided with an information letter outlining the scope and purpose of the research (See Appendix A.iii). If the parent's/student's consent had not been given, those students could not be selected as a key student and their data could not be used within this study. The three selected key students had had to have returned their consent forms and have given their verbal consent on the day. They were reminded that they could withdraw their consent at any time without having to give a reason. They were also reminded that the questionnaires they completed were completely anonymous.

All of the data collected is anonymous and was stored on an encrypted, password protected USB drive. Any names initially recorded have been redacted in the appendices and all questionnaires completed by key participants cannot be traced back to them. Hard copies of

data collected are kept in a secure site in a locked drawer, after the study has been completed all raw data will be destroyed.

Lesson studies

Lesson study 1: (Taught)

Subject: Geography

Year Group: Year 7

Class Size: 32

Grouping: Six groups consisting of 5-6 students.

Students had previously looked at defining and explaining “settlement growth” by looking at Cardiff as an example. This lesson directly followed on from this topic, further developing students’ critical thinking skills by requiring them to identify what problems and benefits they thought could develop as a result of settlement expansion.

The first group task consisted of providing each group with a large sheet of paper and felt-tip pens (one for each student in the group). As there were six groups in total; three focused on creating a mind map of problems, whilst the other three focused on creating a mind map of benefits. After an allocated amount of time (5mins) the groups swapped papers then added to each other’s mind maps, this time with visual cues displayed on the board.

After a mini plenary, involving a class discussion of the benefits and problems identified, students were shown a plan for a new development north of Cardiff. Students had to decide, within their groups, whether they were for or against this proposed development. The second task then involved students composing a letter to the council stating their approval or disapproval by explaining what problems or benefits they think would arise as a result of this development.

I was very impressed with the way students worked on the first task which involved mind-mapping the problems and benefits associated with settlement growth. Students came up with far more problems and benefits than I had anticipated and many drew their ideas from content covered in previous lessons (See Appendix C.iii). Whilst circulating during this initial task I was pleased to hear the geographical discussions occurring and overall, I was pleased with the students’ level of engagements within their groups. The second task (composing a letter to the council regarding a proposed development) is something I will consider making an individual task in future lessons. Students debating their opinions showed their understanding of the topic, however the large majority of the groups did not finish composing their letters. I think the extended written nature of the task may be better suited to individual reflection following a group discussion.

In terms of the level of group involvement from the three key students: the medium ability student showed the highest level of involvement, followed by the low ability student then the high ability student (See Appendix B.i). These findings are in contrast to the hypothesised expected outcome of the study but may be attributed to the social dynamics of the group. Due to the dynamics of the class the high ability student was the only boy present in a group of

girls. He was observed as being visibly uncomfortable in his group which may explain his perceived lack of engagement. This was reflected in his questionnaire response where he stated that he “wasn’t keen on the groups”.

The low ability student’s questionnaire feedback indicates that they felt there was unequal participation within their group and that this was a point of frustration (See Appendix B.iii). Their own participation was ranked low to moderate on the Leuven scale. However, if they were frustrated by their peers seeming lack of involvement this may have negatively affected their own. The student with the highest ranking of involvement was the medium ability student. Interestingly, they also ranked the equal participation of their group members as being low but observation notes recorded them as being “motivated” and a positive contributor (See Appendix B.ii). In contrast to the low ability student, this student engagement did not seem to be affected by their perception of the unequal participation of the other members of their group.

Lesson study 2: (Observed)

Subject: Mathematics

Year Group: Year 7

Class size: 26

Grouping: 5 groups of 4-5 students

The task set required student groups to create a ‘helicopter’ out of paper and paperclips. Instructions were provided for the creation of said helicopter but students had to tweak the dimensions and utilise paper clips to try and maximise flight time. A prerequisite of the helicopters was that they also had to spin. Students were given 4 opportunities to test their creations by dropping them down the stairway, measuring fall time. Students then had to assess their helicopter’s performance and then make justified adjustments to their creation in order to attempt to increase the fall time for the next drop.

The students seemed to really enjoy the creative aspect of this task. Feedback from the key students’ questionnaires reflects this: “it was really fun”. (See Appendix B.vi) Giving the students role cards within their groups was largely effective: some groups ignored the role cards preferring to work on different aspects of the task but they still worked effectively. This was also reflected in the key students’ questionnaires where all students chose a high rating for whether they felt all members of their group were equally involved.

Out of the high, medium and low ability key students; the medium ability student showed the most involvement, followed by the high ability and then the low ability student (See Appendix B.v.). Studying the questionnaire feedback from the medium ability student may help to identify why they showed the highest level of involvement (See Appendix B.vi). Their response to the questions was very positive “it was really nice and amazing” and showed that they enjoyed the task. In comparison the high ability student’s feedback, although still positive, was more neutral. This may indicate that it was the student’s enjoyment of the task that had the greatest influence on their involvement. Although the low ability student also provided positive feedback in their questionnaire “it was really fun” their involvement was observed to be more limited and they were noted as being easily distracted. In this case, it would seem that it was the students’ enjoyment of the task that had the greatest influence on their involvement. Observers did note that only some students could leave the classroom to drop the helicopters and it was during this time when the other students were the most off-task or disruptive. Identifying a way to

involve all of the students in the testing of the 'helicopters could negate this issue as well as remove the need to have another member of staff in the room. However, restrictions due to the layout of the building makes this difficult due to the health and safety considerations involved in gathering 20-30 students at the top of a narrow set of stairs.

Lesson Study 3: (Observed)

Subject: Business studies

Year Group: Year 10

Class size:19

Grouping: 5 groups of 3-4 students

Student groups had to come up with their own business proposals, creating a joint business plan. This included developing a marketing mix. This lesson built upon previous lesson content, requiring students to apply what they had been taught about different business models.

Initially students were very reluctant to work in their selected groups and there was some resistance/disruption. This resistance towards working in groups they hadn't chosen was far more pronounced than in the other two lesson studies. This could possibly be attributed to their age. Being in Year 10, these students are 3-4 years older than the Year 7 participants in the other two lessons. The social dynamics of this group may therefore be more pronounced having had more time to develop relationships with each other, whether these are of a positive or negative nature. Another factor could be related to processes of adolescence that may have an impact on their willingness to participate and engage with peers that they wouldn't otherwise. The students' focus did increase over time, once they seemed to have accepted that they were to work in these groups and had been distracted by the task at hand. Interestingly despite the initial resistance, all of the key students rated their feelings about working in groups highly (See Appendix B.ix). However, one made an additional comment stating that they would have preferred to have chosen their own groups.

In this lesson study the high ability student showed the most involvement, ranking highly on the Leuven scale (See Appendix v.iii). They were consistently on task and contributing to the group work This is the only lesson in which the high ability student was indeed the most active participant within their group. However, the lower ability student also ranked highly on the Leuven scale. They were recorded as "taking control of the task" and being the "main contributor" towards the work.

The medium ability key student's questionnaire response had an overall negative tone. This student ranked very low on the adapted Leuven scale, and observation notes included that he was easily distracted and passive towards the activity. His response to the questionnaire suggests that he found the task difficult and felt that he didn't have enough prior knowledge to complete it. Written responses to the questionnaire included comments such as "I'm dumb" and "I didn't get anything". This negative reaction could be linked to Dweck's (2008) research into the growth mindset. This research looks at how a person's underlying beliefs about their own learning and intelligence can have an impact on their motivation and achievement. I would suggest that this key student's response to the questionnaire is indicative of a more fixed mindset. Their observed low level of involvement and tendency to be distracted may have

been because they were unwilling to engage and saw this as an opportunity to rebel/socialise with friends. Or it may also be a reaction to having already decided that he was incapable of doing the work due to his potentially fixed mindset. Only further observations of this particular student could ascertain the underlying issues responsible for his attitude towards the task. However, if his behaviour is a result of a 'fixed mindset' then ensuring that positive feedback is given when he does achieve may help to change his attitude towards his own capabilities.

Findings

In the first and second lesson studies the medium ability key students showed the most active involvement. In the third lesson study the key student that showed the most involvement was the low ability student. If you relate these findings back to the study question "When working in mixed ability groups do higher attaining pupils dominate while lower attaining pupils participate less?", it is clear that within this study that this was not the case. In all three lesson studies the higher ability students did not dominate during the group task.

Research findings indicate that level of participation shown by children and young people during group task seemed to depend much more on the social dynamics of the group rather than their perceived ability. Social dynamics have many parameters and can be very complicated. For example, in the first study, the high ability key student was the only boy within a group of girls. He registered very low on the modified Leuven scale, but when questioned during the lesson and by looking at his answers to the questionnaire (See Appendix B.iii) it was clear that he had a very clear understanding of the point of the task and the lesson as a whole. Both observers noted that this student seemed very uncomfortable in his allocated group. This perceived uneasiness may explain why this high ability student had minimal interaction with the others in this group. As such, the aforementioned ideal of higher ability students aiding their peers progress in their zone of proximal development is unmet. However, there was some evidence of this in the group including the medium ability key student. It was recorded within observation notes (See Appendix B.ii) that members of this group looked towards this key student for help. It was also noted that this student, in contrast to the high ability key student, seemed confident within their allocated group. This confidence and social ease may be what encouraged the other students to seek help from them. This observation suggests that it is more the personality of the individual rather than their academic ability that determines how the group interacts.

Gilles and Ashman's statement that "low achieving students perform better in heterogeneous classes" suggest that in mixed ability groups the low ability student would benefit the most. Across the three lesson studies the low ability student's involvement was ranked low in two lessons and high in one. In the third lesson study the low ability student had a high level of involvement. They were observed being actively engaged and taking control of the task. However, this seemed to be partially due to the fact that he seemed to be allocated this role by his peers who showed a much lower level of engagement. This was noted (See Appendix B.vii) during teacher questioning when he appeared to be put under pressure by his peers to give the group's feedback. When this student completed the questionnaire, he gave a low ranking for the equal involvement of members of the group. This reflects the notes made during observations recognising that the student was mostly on task despite the rest of the group not participating (See Appendix B.viii). As such, when based on their level of involvement, within this research there is little evidence of low achieving students performing better in mixed ability groups.

In none of the lesson studies was it recorded that the higher ability student totally dominated during the group tasks. Although, on the whole, those higher ability students were seen to have shown a high level of involvement it was largely proportional to the others in their groups. Linking back to Giles and Ashman's (2003:60) analysis of "co-operative learning as a learning strategy" this study also recognises that it is the "individual characteristics and social factors" present during student group work as well as the lesson content and organisation that influence the outcomes and effectiveness of such strategies.

Future Recommendations

The findings of this study have highlighted that when providing students with group work a more reactive style of teaching may be necessary. For example, within my own lesson study, I feel that in order to have maximised the high ability key student's involvement I should have moved them into a different group. This should not be a reaction to poor behaviour or a student's lack of willingness to try and interact with their group. However, when it becomes obvious that the student is not comfortable within their setting, action might be worth considering if the alternative is the student's withdrawal. Whilst being able to work with a range of different people is a key workplace skill, at this point in a child's development the aim is not to create a negative reaction towards group work.

Another point to note when setting group work is the availability of resources to all of the students involved. In the first lesson study, providing a felt tip pen to each of the students in the group resulted in more of them participating in the construction of their mind maps. In contrast, in the third lesson study, there were not enough pens for each member of the group. This is a factor that I feel may have contributed to a decrease in the equity of participation.

Organising the group members and table arrangement prior to the lesson was effective in terms of minimising disruption at the beginning of the lesson. Displaying the names of those in each group on the board as students came in allowed them to organise themselves relatively quickly. Although teaching timetables may not always allow for this to be done prior to the lesson efforts should be made where possible as it does save lesson time and student fussing.

One way of potentially increasing student participation when working in groups involves giving students roles within their groups. This was seen partially in Lesson Study One and more so in Lesson Study Two. In Lesson Study one the second task required students to allocate each other certain roles in order to complete the given task. Lesson two took this further by providing role cards, this made the allocating of roles seem more official and students engaged with this.

Conclusions

This study has highlighted that there is indeed "more to group work than sitting students in groups and asking them to work together" (Blatchford et al 2003). Taking this forward into my next teaching placement, I will endeavour to put more thought into the dynamics of student group work. This may include a mixture of allowing students to work with whom they choose and grouping students based on ability. However, when grouping students, I will try to take into account the social dynamics of the class in order to avoid isolating students or making them feel unnecessarily uncomfortable. Allocating student roles within groups is also something I will also attempt to implement in my lessons in order to try and increase student participation. This is something I felt worked well in the second lesson study and is therefore

a technique worth experimenting with. Having physical items such as cards or lanyards to allocate these roles may feel more official, gaining more of a response from the students involved.

The findings of this research indicate that when working in mixed ability groups you cannot assume those of higher ability will dominate over those of lower ability. Indeed, the patterns of participation in relation to ability varied from lesson to lesson and from group to group. A larger study, across multiple lessons, looking at how mixed ability group participants behave, would provide more qualitative data that could be used to further explore this dynamic. However, I still value the usefulness of mixed ability groups as a way in which to encourage students to develop their ability to work as a team, aiding each other in their learning in a way relates to Vygotsky's aforementioned zone of proximal development.

In terms of the study methodology, working in a triad allowed for joint observations. This was beneficial as it allowed observers to compare and contrast their observation notes. It was interesting and reaffirming to see that in each lesson study both observers ranked the key student's involvement similarly. Conducting the research in the form of a lesson study allowed the delivery of the lesson and subsequent reflections to be designed in a way that informs pedagogical practice. The experience has allowed me to reflect on and hypothesise ways of maximising the benefits of mixed ability group work. However, the lesson study model is not without its limitations. Any study that looks at a singular lesson provides limited scope for analysis. Although this research comprised of three lessons in total; three different classes were involved as well as the teaching of three different subjects. This means that the social dynamics in each lesson are completely different, this was particularly noticeable when looking at the year 10's reaction to the group work in comparison to the year 7's.

It should also be noted that due to the ethical considerations pertaining to the study that the study outcomes may be influenced by the Hawthorne effect. The Hawthorne effect explains that when participants are aware of being observed they will both consciously and unconsciously change their behaviour. This may be particularly pronounced within this study as students were also aware of the purpose of the study. Additionally, myself and the other researchers involved were known to the students. This potentially may have had an influence on the key students' questionnaire feedback as they may not have wanted to have appeared too negative. This same factor may have also unconsciously influenced my own actions and those of my fellow researchers, as we are familiar with these classes and would therefore already have our own preconceptions. Arguably, the results of such a study may be more reliable if conducted by an unfamiliar, neutral party.

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