2019 cohort

Joe Oliver – Maths Teacher

WHITE WORKING-CLASS BOYS AND HIGHER EDUCATION - How do three sessions promoting a growth mindset impact on underachieving year 9 white working-class boys' aspirations for higher education?

Setting the Scene

Only 18% of white working-class boys entered higher education in 2017/2018 second only to Gypsy/Roma/Traveller ethnic groups (Department For Education, 2019b). The reasons for this have been discussed in (Baars, Mulcahy, & Bernardes, 2016) and have been collected in to four different categories two of which are attainment and aspirations. It is quite obvious that attainment is the biggest barrier to entering higher education as white working-class boys are the lowest performing group in our educational system (Strand, 2014). In 2018 only 14.4% of Boys who receive FSM achieved a grade 5 or above in both Maths and English compared to 19.1% of girls reviving FSM (Department For Education, 2019a). In the same year 42.4% of boys not reviving a FSM achieved a grade 5 or above in both Maths and English compared to 49.8% of girls not reviving FSM (Department For Education, 2019a). This shows a great disparity between the achievements of students who receive FMS and those who do not, but also between girls and boys. Although we are not using FSM as a proxy for working-class there are close links and considerable overlap of students who receive FSM and are PP (Ofsted, 2012). With regards to aspirations Baars et al. (2016) suggest that working-class parents are more likely to have low aspirations for their children and also "parents and pupils are less likely to aspire to go to university compared to their middle class counterparts" (Baars et al., 2016).

In this study we will focus on the students attainment and aspirations linking this with the potential 'mind sets' of the students: whether the students possess a more *growth mindset* or *fixed mindset*. Students with a growth mindset believe that intelligence is malleable and can be developed by learning. Students with a fixed mindset believe that intelligence is something you possess and cannot be changed (Dweck, 2006).

The Research Project

The intervention applied in this study was closely modelled on that of (Yeager et al., 2019; Blackwell, Trzesniewski, & Dweck, 2007; Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2012) and was split into three 30-minute sessions. Some tasks were adapted from a growth mindset lesson plan (Khan Academy and PERTS, 2015). The first session focussed on neuroanatomy and neuroplasticity, introducing and discussing the role of neurons in the brain and reinforcing the analogy that the brain is like a muscle that needs training to become stronger. The session ended with a TED talk illustrating the power of belief and mindset. The second 30-minute session was delivered a week after the first where participants were then asked to complete a mathematics task using mini-whiteboards. This task, titled 'Four 4's', has been credited as a task that promotes growth mindset (Boaler, n.d.). Participants were encouraged to find as many different solutions as possible during the task and were asked to come up to the board to write 1

their solution on the board. If a participant wrote an incorrect solution they were encouraged to check their solution, hopefully learning from criticism. The third session was focussed on discussion and motivation. Participants discussed the significance of the fact that the brain can become

stronger with exercise and training. Personal stories were shared from teachers and participants of times when they had to work hard to achieve their goals. Many of these stories focussed on being inept at a task but through trial and error, training and failing they succeeded. This session closely followed that of (Blackwell et al., 2007) but on a smaller scale.

I hypothesised that the intervention would shift participants' perspectives towards a more growth mindset and that the shift would also modify the participants' aspirations to attend higher education.

To measure the effects of the intervention there were two questionnaires completed by participants. The first questionnaire was a baseline questionnaire which was based upon the Implicit Theory of Intelligence Scale (Dweck, Chiu, & Hong, 1995) were to assess if the participants possessed a fixed mindset or a growth mindset. There were also questions to gauge the participants' aspirations with regards to higher education. To compliment the questionnaires and to analyse any tangible effects of the participants potential shift from a more fixed mindset to a more growth mindset, maths homework data was harvested. This data will also be used to assess if the students attainment was effected with the potential shift to growth mindset.

Results

Participants. The study took place in a year 9 classroom in a secondary school situated in a deprived suburban area and was introduced to 18 low attaining year 9 students. Of the 18 students, all students were of white British declaration, 11 were boys 7 were girls, 13 were PP of which 8 were boys and 5 were girls. Consent was given by 10 students and due to the ongoing COVID-19 pandemic some of the consenting students had to self-isolate. Due to this only 6 participants were included in this study. Of these 6 participants 3 were male and 3 were female, 2 were PP and only 1 participant fell into the target demographic of white working-class boys. Due to only one participant being in the white working-class boys category this will greatly limit any conclusions that can be drawn from the effect of the intervention on this demographic. Some conclusions could be drawn as to the effect of the intervention on white working-class or low attaining white British students removing the focus on boys and/or working-class.

Findings. This study was able to analyse the impacts of the intervention on the stu dents mindset and their aspirations but students attainment was not accurately mea sured due to the limitations on the homework data. What can be said is that the intervention may have had a slight positive effect on the participants aspirations and expectations and also there is a correlation between participants mindset and their as pirations with regards to higher education. All participants with a more fixed mindset also had low expectations and aspirations with regards to higher education. Conversely, participants with a more growth mindset had higher expectations and aspirations for higher education corroborating the findings of (Degol, Wang, Zhang, & Allerton, 2017; Huang, Zhang, & Hudson, 2018; van Tuijl & Walma van der Molen, 2016; Liu, Robinson, & Xu, 2018).

References

Baars, S., Mulcahy, E., & Bernardes, E. (2016). *The underrepresentation of white working class boys in higher education: The role of widening participa tion*. Retrieved from https://www .cfey .org/wp -content/uploads/2016/ 07/The -underrepresentation -of -white -working -class -boys -in -higher -education-baars-et-al-2016.pdf

Blackwell, L., Trzesniewski, K., & Dweck, C. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78* , 246–263.

Boaler, J. (n.d.). *Day 1: Four 4's*. Retrieved from https://www.youcubed.org/ wp-content/uploads/2017/03/WIM-Day-1-gr-3-4-vF.pdf

Burnette, J., O'Boyle, E., VanEpps, E., Pollack, J., & Finkel, E. (2012). Mind-sets mat ter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin*, *139* , 655–701.

Degol, W., Wang, M., Zhang, Y., & Allerton, J. (2017). Do growth mindsets in math benefit females? identifying pathways between gender, mindset, and motivation. *Journal of Youth and*

Adolescence, *47* (5), 976–990.

Department For Education. (2019a). *Key stage 4 and multi-academy trust performance 2018 (revised)*. Retrieved from https://www.gov.uk/government/statistics/ key-stage-4-and-multi-academy-trust-performance-2018-revised

Department For Education. (2019b). *Widening participation in higher education, england, 2017/2018 age cohort – official statistics*. Retrieved from https:// assets.publishing.service.gov.uk/government/uploads/system/uploads/ attachment data/file/852633/WP2019-MainText.pdf

Dweck, C. (2006). *Mindset: The new psychology of success*. New York: Random House. Dweck, C., Chiu, C., & Hong, Y. (1995). Implicit theories and their role in judgments and reactions: A word from two perspectives. *Psychological Inquiry*, 6 , 267–285. Huang, X., Zhang, J., & Hudson, L. (2018). Impact of math self-efficacy, math anxiety, and growth mindset on math and science career interest for middle school students: the gender moderating effect. *European Journal of Psychology of Education*, *34* (3), 621–640.

Khan Academy and PERTS. (2015). *Growth mindset lesson plan*. Retrieved from https :// www .mindsetkit .org / topics / teaching -growth -mindset / growth -mindset-lesson-plan

Liu, Y., Robinson, M., & Xu, H. (2018). The effect of mindset on students' desire to work for big four accounting firms and on academic performance. *e-Journal of Business Education and Scholarship of Teaching*, *12* (2), 92–106.

Ofsted. (2012). *The pupil premium*. Retrieved from https://assets.publishing .service .gov .uk/government/uploads/system/uploads/attachment data/ file/413222/The Pupil Premium.pdf

Strand, S. (2014). Ethnicity, gender, social class and achievement gaps at age 16: intersectionality and "getting it" for the white working class. *Research Papers in Education*, *29* (2).

van Tuijl, V., & Walma van der Molen, J. (2016). Study choice and career development in stem fields: an overview and integration of the research. *International Journal of Technology and Design Education*, *26* (2), 159–183.

Yeager, D., Hanselman, P., Walton, G., Murray, J., Crosnoe, R., Muller, C., . . . Dweck, C. (2019). A national experiment reveals where a growth mindset improves achievement. *Nature (London)*, *573* (7774), 364-369.