PRO BONO ECONOMICS

In partnership with:

Villiers Park Educational Trust

Assessing the impact of the Scholars Programme

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Executive summary

Villiers Park Educational Trust (Villiers Park) is a national charity that works to support social mobility in the UK. The Trust helps young people from disadvantaged backgrounds develop a passion for learning and reach their full potential. There is extensive evidence showing that children in this group tend to underachieve relative to their peers from more advantaged backgrounds.

Villiers Park seeks to tackle the underlying barriers to social mobility through a range of programmes that are targeted at secondary aged young people. This study focuses on the Scholars Programme, which is a 4-year programme designed to help highly able students aged 14-18 from less advantaged backgrounds to reach their full academic potential.

Study scope and aims

Villiers Park asked Pro Bono Economics to assess how students benefit from participation in the Villiers Park Scholars Programme. We have looked at the impact of the programme on the following three outcomes:

- Development of the 'soft skills', such as self-management, team working and independent thinking targeted by the programme.
- Academic attainment at key stage 4 and 5.
- Success in gaining a place at a leading university.

Our study is based on data gathered by Villiers Park on the academic attainment of students who participated in its Scholars Programme during the academic years 2016 and 2017. We also assess the impact of the programme on students' soft skills development using survey data for a sample of Scholars in 2017/18.

Summary of findings

- Surveys of participants on the Villiers Park's Scholars Programme indicate that the programme has a positive impact on soft skill development. Over 80% of students felt they have seen some or significant improvement across a range of soft skills including self-confidence, communication skills, teamwork and resilience.
- Students identified self-management as the area in which they had made most improvement. This is also the area identified by students as their biggest weakness at the outset of the programme.
- We find evidence of a large positive impact on GCSE attainment for students participating on the Scholars Programme. Villiers Park pupils achieve around three quarters of a grade higher for each GCSE subject than might have been expected had they not they participated in the programme when compared to other students from disadvantaged backgrounds.
- We find tentative evidence that Villiers Park's programmes may have an impact on educational attainment at A-level. Our assessment suggests that A-level results for those participating in the programme are slightly higher than we might have expected given their GCSE results. However, when we account for the positive impact of the programme on GCSE results, our analysis suggest that A-level grades may have been boosted by upwards of 1.5 grades per subject taken.

- Around 80% of Scholars go on to attend university, with two-thirds of these studying at universities in the top third of institutions. This is well above the national average for pupils from low income backgrounds studying at Key Stage 5, which is 47% for those attending university, and 12% for those attending the top third of institutions.

1 Introduction

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Structure of the report

The remainder of the report has the following structure:

- Section 2 sets out our logic model for how Villiers Park fosters cognitive and non-cognitive skills and evidences how this leads to students' self-improvement
- Section 3 explains why soft skills are important to social mobility and outlines how Villiers Park helps young people from disadvantaged backgrounds.
- Section 4 considers how participation in the Scholars Programme helps improve students' academic attainment at KS4.
- Section 5 considers how participation in the Scholars Programme helps improve students' academic attainment at KS5.
- Section 6 assesses how the Scholars Programme helps young people to gain a place at a leading university.

Annex 1 comments on several aspects of data collection by Villiers Park.

2 The Villiers Park Approach

Background

Social mobility in the UK is very low compared to other countries. This deep-rooted problem has been recognised by the Social Mobility Commission, which has presented compelling evidence that social mobility is deteriorating for the current generation of young people in the UK.[1] There are several fundamental barriers holding back low- and middle-income families and communities in the UK from fulfilling their true potential in society, including limited access to good educational opportunities which limits educational attainment for disadvantaged children.

There is extensive research that the academic attainment of students from disadvantaged backgrounds is lower than their peers.[2] The average pupil eligible for free school meals leaves school with the equivalent of seven D grades and an E grade at GCSE. Their wealthier peers average seven C grades and a B grade[3]. Those young people from low-income homes with similar GCSEs to their better-off classmates are still a third more likely to drop out of school at 16. Disadvantaged students are also less likely to attend prestigious[4] universities, meaning that the full extent of those pupils' talents is less likely to be unlocked.[5] Inevitably less than one in eight children from a low-income background ends up in a high-income job. A variety of reasons impact on the greater risk of this group not realising their academic and hence earnings potential including: lack of access to learning resources; lack of role models and support; and lower confidence and aspirations.[6]

Overview of Villiers Park

Villiers Park seeks to tackle the underlying causes of low social mobility[7] by working with highly able students from disadvantaged backgrounds. It currently works with secondary schools in seven regions in the UK, providing support to over 750 students on an annual basis. The charity has three programmes that support secondary school students aged 14-18, and young people in higher education or the early years of their career:

- Scholars Programme;
- Inspiring Excellence Programme; and
- INVOLVE Programme.

These programmes help students improve their academic performance and develop work-related skills, as well as seeking to challenge them and inspire them to learn more within their fields of interest. The underlying aim is to enable students to succeed in life, reaching their potential to become tomorrow's leaders.

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[1] See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/569410/Social_Mobility_Commission_2016_REPORT_WEB__1__.pdf

[2] A systemic review of factors linked to poor academic performance of disadvantaged students in science and maths in schools. Pallavi Amitava Banerjee. 2016. https://www.tandfonline.com/doi/full/10.1080/2331186X.2016.1178441

[3] Defined by socio-economic status - https://www.ifs.org.uk/uploads/publications/wps/WP201431.pdf

[4] Russell Group

[5] 'Rule of the Game: Disadvantaged students and the university admissions process'. Sutton Trust. 2017. https://www.suttontrust.com/wp-content/uploads/2017/12/Rules-of-the-Game.pdf

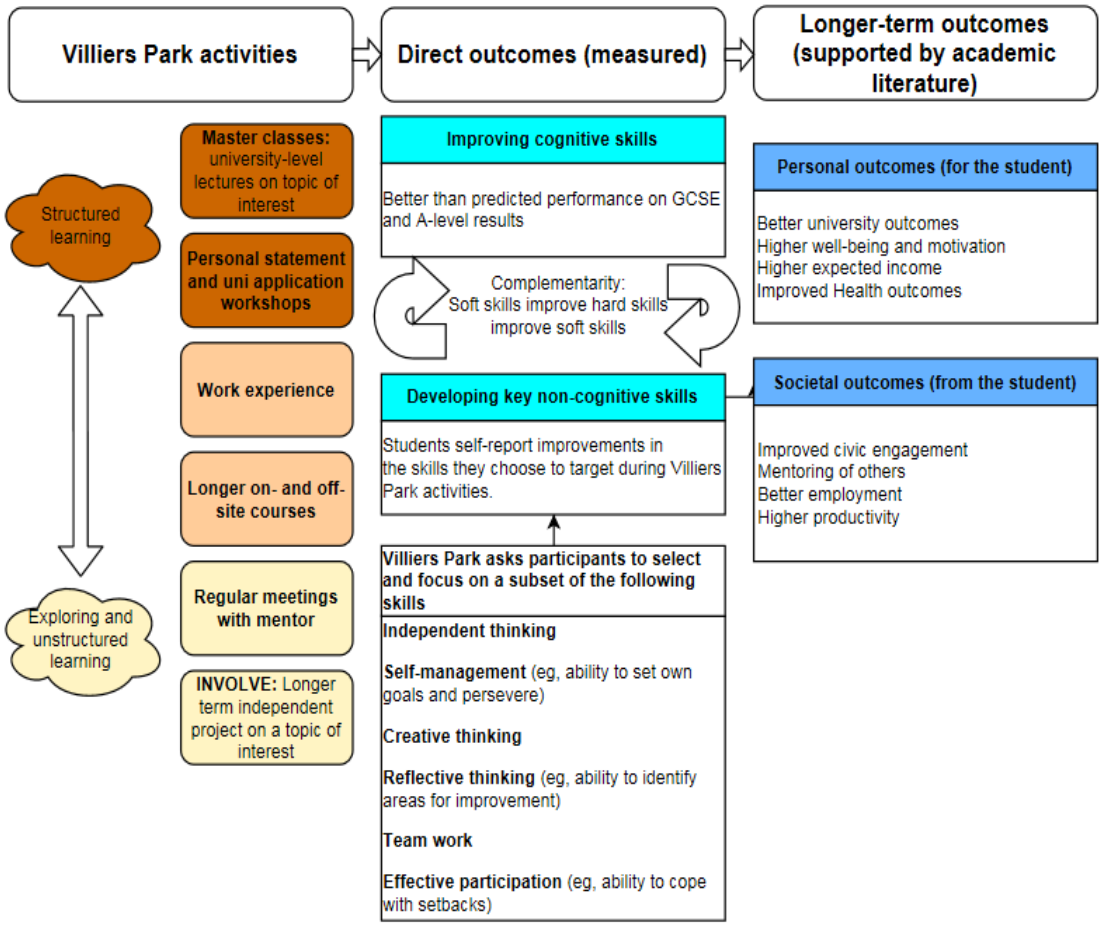
[6] A systemic review of factors linked to poor academic performance of disadvantaged students in science and maths in schools. Pallavi Amitava Banerjee. 2016. https://www.tandfonline.com/doi/full/10.1080/2331186X.2016.1178441

[7] (Reardon, 2011 Reardon, S. F. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In R. Murnane & G. Duncan (Eds.), Whither opportunity? Rising inequality and the uncertain life chances of low-income children. New York, NY: Russell Sage Foundation. [Google Scholar]; Steele, 2010 Steele, C. M. (2010). Stereotyping and its threat are real, American Psychologist, 53, p.680.[Crossref], [Web of Science ®], [Google Scholar]).

Scholars Programme	Inspiring Excellence Programme	INVOLVE
• A 4-year programme for students from age 14 • Provides masterclasses, mentoring, online support, one-day workshops and workplace visits	• Subject-specific residential courses for post-16 students • 210 A-level and 10 KS3/KS4 free online extension activities	• Support students in running self-directed projects in their own educational community

Figure 1 below sets out a high level 'logic model' that shows how the activities carried out by Villiers Park contribute to improved cognitive and non-cognitive skills that result into improved longer-term outcomes for students. This highlights the emphasis Villiers Park places on soft-skill activities as an integral part of all of its flagship programmes, and the complementarity between 'hard' cognitive skills and soft skills development that are central to its approach to helping disadvantaged students to reach their potential.

Figure 1. High level logic model for Villiers Park



Villiers Park provide a range of activities that are aimed at developing soft-skills, including individual projects, masterclasses, mentoring, and on- and off-site courses. These activities are designed to challenge students and promote development of initiative and flexible problem-solving skills and leverage the complementarity between soft and hard skills.

The Scholars Programme, which is the focus of this study, includes residential courses in which sixth-form students benefit from several days of university-level lectures and discussions. These focus on topics that are related to the students' areas of interest to ensure a high level of motivation and are designed to foster their interest in university and help develop the skills needed to succeed in further education (such as perseverance).

Scholars also benefit from participation in the INVOLVE Programme, which emphasises unstructured learning and exploration. Students are given time and resources to pursue a project of their choosing, such as organising science experiments for younger students, building websites, making aerial photography with drones, and producing music videos.

For many disadvantaged students, the Scholars Programme may be the first time that they have had the opportunity and support to develop something they are passionate about, and the effect can be transformative:

> *This was the first time I had ever taken up the role as a project manager, which is certainly something I would be willing to do again, it really allowed me to explore my leadership skills and take [responsibility] of the group, making sure that everyone knew what they were doing and that no one felt left out/confused. My communication skills with the others as well as teachers and the year 8 students also built up, and I am very thankful for this experience.*

Scholars have regular meetings with qualified mentors throughout the programme that provide guidance and support. Mentoring sessions provide an important opportunity for self-reflection, allowing Scholars to think about their personal goals and the skills needed to achieve them. Mentors can also serve as role models for students, as well as an important source of advice.

3 Impact of the Scholars Programme on soft-skills development

Non-cognitive (or 'soft') skills encompass a broad range of character traits such as personal resilience, ability to work in a team, passion for learning, and work ethic. Unlike cognitive (or 'hard') skills, such as literacy and numeracy, non-cognitive skills are difficult to measure with standardised tests, and have typically received relatively less attention in schools, government policy, and the academic literature. This situation is rapidly changing with the growing recognition that non-cognitive skills play an important role in promoting positive outcomes for young people in educational attainment, employment, health, and well-being (McNeil 2012).

This section first briefly discusses the key reasons why soft skills are so important to outcomes and then outlines concerns around their relative neglect in schools. We then discuss survey evidence that points to the positive effect of the Scholars Programme on the development of students' soft skills.

3.1 The importance of non-cognitive (or 'soft') skills

Soft skills are important for a variety of reasons, including:

- Soft skills are linked to better educational attainment: success in school requires good work ethic, perseverance, and an ability to motivate one's self to learn. Nobel Prize winning economist James Heckman and Kautz (2013) found that interventions aimed at improving "character skills" provided more long-term benefits to educational attainment than interventions focusing directly on cognitive skills.[8]
- Soft skills are linked with better employment outcomes: Heckman and Kautz (2013) note a strong correlation between job performance and wages and conscientiousness (the ability to remain hard-working and organised over time).
- Soft skills underpin wellbeing: research indicates that soft skills play an important role in helping people to live happy, healthy lives, and maintain positive relationships with those around us.[9]
- Soft skills promote valuable pro-social behaviours: the Young Foundation (2012) notes evidence that parents with high levels of soft skills are better able to support their children to do well at school.[10] This is consistent with Cunha and Heckman (2010), who theorise that developing soft-skills early in life has a virtuous circle effect, making it easier for people to develop both cognitive and non-cognitive skills in the future.[11]

[8] Heckman J., Kautz T. (2013), 'Fostering and measuring skills: Interventions that improve character & cognition', NBER Working paper no. 19656.

[9] See https://www.epi.org/publication/the-need-to-address-noncognitive-skills-in-the-education-policy-agenda/#epi-toc-12, and Gale, Batty, Deary (2008).

[10] https://youngfoundation.org/wp-content/uploads/2012/10/Framework-of-outcomes-for-young-people-July-2012.pdf

[11] http://jenni.uchicago.edu/papers/Cunha_Heckman_etal_2010_Econometrica_v78_n3.pdf

The importance of soft skills

"Soft skills such as teamwork, communication and confidence are considered by young people, teachers and workers to be as important to achieving success in life as good grades."

43% of young people don't feel prepared to enter the work force, with many worried that they lack confidence and soft skills.

72% of employees don't think they had all the soft skills they needed to do well when they first entered the workplace.

91% of teachers think schools should be doing more to help students develop soft skills

Source: The Prince's Trust

3.2 Concerns around soft skill development in schools

Despite their importance, soft skills are often neglected in schools. Students from low income backgrounds particularly are less likely than their peers to have opportunities to develop the non-cognitive, or 'soft' skills that underpin effective learning and promote successful academic and career outcomes[12]. Sutton Trust research for example highlights that in today's labour market employers are forced to differentiate more on "soft skills" which gives those from higher socioeconomic backgrounds further advantage[13].

While these skills are often overlooked in schools generally, pupils from low income families are less likely to be able to partake in the types of activities than their higher income counterparts. For example, soft skills are often acquired through organised extra-curricular actives, such as team sports, debating clubs, drama clubs, etc. which studies show[14] are generally less open to low income students both through their school and home environments with parental involvement and financing important explanatory factors.

Disadvantage also has less obvious, but perhaps more insidious, effects on child development. A literature review by Sheehy-Skeffington and Rea (2015)[15] summarises the recent evidence of how disadvantage can negatively impact decision-making. For example, people growing up with low socio-economic status perform worse on exercises of selective attention and inhibitory control e.g. resisting distraction; both of these are soft-skills important for well-being and development. Furthermore, their socio-economic background negatively impacts people's judgement of their own self-worth – disadvantage makes them feel they deserve less than others.

The negative effects of disadvantage get compounded over time if they are evident early in life. As Cunha and Heckman (2010) note, acquiring skills early in life makes acquiring new skills later on easier. The flip side is that, if disadvantaged children do not develop their skills early, they are only likely to fall further and further behind relative to their peers over time.

On a positive note, soft skills are not a fixed attribute and can be taught. A recent United Nations report by Zhou (2016) reviews the academic literature to find evidence that all major clusters of soft skills can be improved by targeted interventions.[16] Given the virtuous cycle of skills creating skills, earlier interventions will yield larger benefits.

[12] Social Mobility Commission, *Socio-economic Diversity in Life Sciences and Investment Banking*, September 2016

[13] https://www.suttontrust.com/wp-content/uploads/2017/07/BCGSocial-Mobility-report-full-version_WEB_FINAL.pdf

[14] http://journals.sagepub.com/doi/full/10.1177/0002716214548398

[15] http://www.lse.ac.uk/PBS/assets/documents/2017-sheehy-and-rea-report-3234-final-1.pdf

[16] http://unesdoc.unesco.org/images/0024/002455/245576e.pdf

3.3 Development of soft skills through the Scholars Programme

In this section we consider the impact of participation in the Scholars Programme on students' soft skills, using data collected in two surveys carried out in 2017/18 as follows:

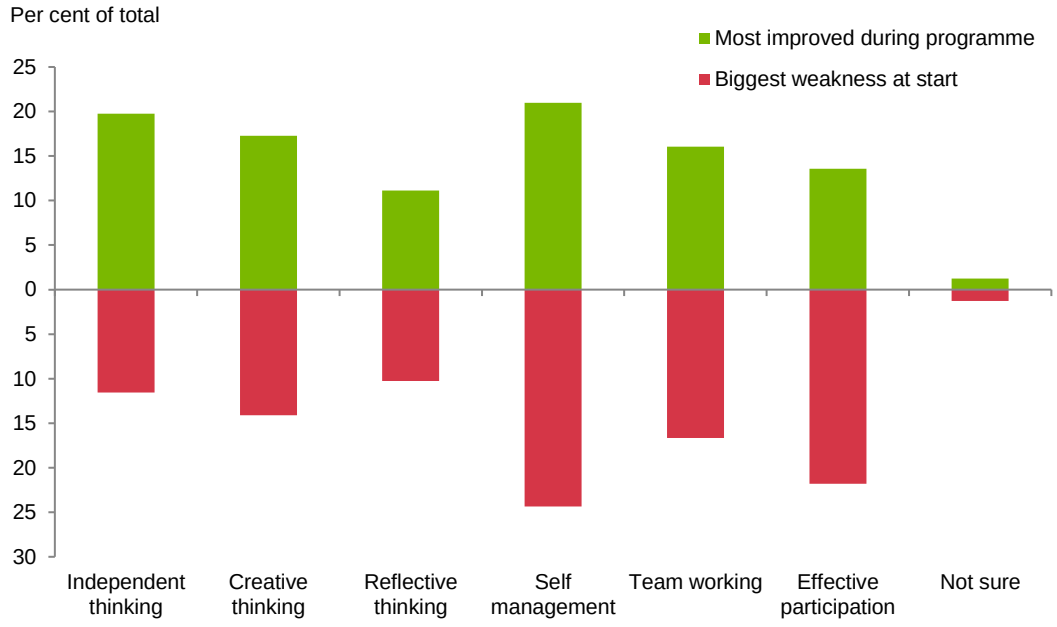
- A bespoke survey developed for this study which was completed by 58 current Villiers Park Scholars (these included both Year 11 and Year 13 students); and
- A survey of 135 Year 11 and Year 13 students in the Scholars Programme carried out in 2017 as part of Villiers Park's annual monitoring activities.

Bespoke survey of current Scholars

This survey identified six clusters of soft-skills targeted by the Scholars Programme and asked students to assess the following questions:

- Before you started the Scholars Programme, what were the one or two skills you felt were your biggest weaknesses, and why?
- What are the one or two skills where you have improved the most during your time on the Scholars Programme, and why?

Figure 2. Summary of responses to weaknesses and improvements survey



Source: Data collected by Villiers Park in 2018 on request of authors (n=58)

Figure 2 summarises the 58 responses received. A quarter of participants identified self-management – the ability to set goals, prioritise, and persevere when facing setbacks – as their biggest weakness. This is in line with the academic literature which suggests that there is a link between growing up with lower socio-economic status and reduced ability to self-regulate and act in line with future goals.[17] Encouragingly, over a fifth of respondents indicated that self-management is the area where they had improved most during their time with Villiers Park.

The effect of the programme on students' self-management skills is illustrated in the following survey responses.

[17] http://www.lse.ac.uk/PBS/assets/documents/2017-sheehy-and-rea-report-3234-final-1.pdf

"I think that being able to successfully set goals for myself is a big achievement. My learning mentor has really helped me to overcome challenges and be more independent in creating effective plans for my revision".

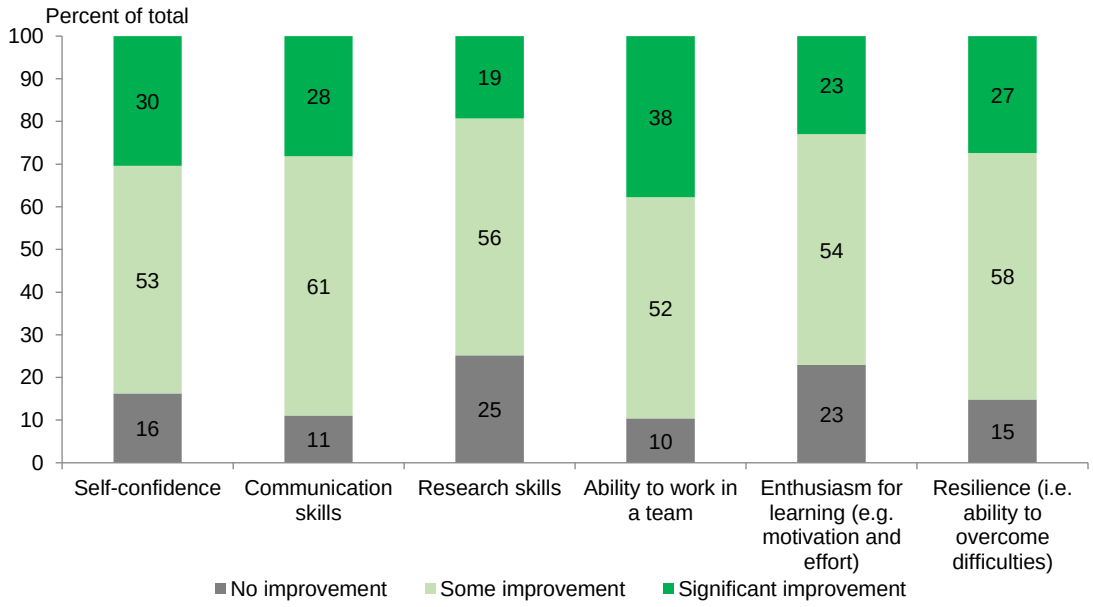
"My self-management to prioritise and set times has improved. My mentor helped me make a study timetable and I was able to prioritise studies, extracurricular activities and leisure".

These quotes suggest that the Scholars Programme has improved students' sense of agency and control over their futures, both of which are important determinants of well-being.

Villiers Park annual survey of Scholars

This survey asks current participants in the Scholars Programme (Year 11 and Year 13) to rate their improvement in certain areas on a three-point scale: no improvement, some improvement, and significant improvement. On average, over 80% of respondents report some or significant improvement in the areas addressed in the survey. The most notable improvements are reported for confidence, communication skills, ability to work in a team, and resilience. The majority of Villiers Park programmes explicitly involve elements of teamwork and presentations.

Figure 3. Student self-assessment of Soft Skills Improvements



Source: Villiers Park Annual Survey, 2017 (n=135)

The positive effects of the Scholars Programme are illustrated in the following survey responses:

"The residential trips have been very positive for my self-confidence to grow and I have met lots of new people that I hope to stay in contact with after I leave the programme. It was great to experience what living away from home would feel like even if it was only for a couple of days! It gave me the opportunity to build my confidence and decrease my anxiety while away from home".

"The Scholars program has helped me work as a team and has helped me build my communication skills. I now feel much more confident in talking to people I don't know. The mentoring sessions and the trips are great and really give me a feel of what university life is like".

"Before Villiers Park, I usually wasn't very confident when completing tasks in a team, but after the program, I've learned how to do it better".

> *"I found working with groups rather difficult due to my social anxiety, but both mentors I've had, Becky and Alex, have been so helpful in supporting me and helping me engage in group activities and work in a team, as well as not give up when things get hard".*

The survey evidence illustrates the positive effect that the Scholars Programme has in creating opportunities for students to grow and develop a range of soft skills. Without the programme, these skills may remain under-developed for many disadvantaged students who lack the same opportunities as more advantaged students, resulting in poorer outcomes. In the next section, we consider how access to the range and type of activities available through the Scholars Programme influences students' academic attainment.

4 The impact of Villiers Park on Key Stage 4 attainment

Evidence suggests that academic attainment is lower for children from a disadvantaged background. For example, academically able pupils in the most deprived schools enter fewer GCSE examinations and achieve half a grade less per GCSE examination than similar pupils in the most advantaged schools, controlling for factors such as ethnicity, social background, and prior attainment. Similarly, disadvantaged academically able students are ten times more likely to take a vocational rather than an academic route at age 16.[18]

In part, the difference in academic attainment reflects less well-developed soft skills. As explained earlier, educational attainment may be affected if soft skills such as work ethic and perseverance are undeveloped. Similarly, confidence in one's academic abilities, high educational aspirations, and hope for the future have been deemed as protective factors contributing to the academic resilience of students living in poverty.[19] The lack of role models is another key contributing factor to poor academic performance for disadvantaged students.[20]

Some elements of the Villiers Park programmes are directly aimed at improving educational attainment of pupils. For example, the subject-specific courses afforded as part of the Inspiring Excellence Programme are intended to stretch pupils academically. The mentoring sessions can cover areas such as revision skills, again intended to support attainment. However, given the link between soft skills and educational outcomes, it is envisaged that all elements of the Villiers Park programmes are likely to play a role in supporting attainment.

4.1 Villiers Park's current approach

Villiers Park currently assesses the impact of the Scholars Programme on academic attainment by comparing Scholars' actual results in Key Stage 4 assessments to their predicted results. Using this methodology, Villiers Park finds that Scholars achieve results in Key Stage 4 assessments that are around one third of a grade higher for each of their GCSE subjects than predicted.[21] This suggests that the programme has a marked positive impact on performance at GCSE level.

Villiers Park predicts Key Stage 4 results for Scholars using the Department for Education's (DfE) Progress 8 methodology in which attainment at Key Stage 4 is predicted on the basis of Key Stage 2 results for all pupils nationally with the same Key Stage 2 grades, regardless of their background.[22] However, it seems likely that that predicted attainment at Key Stage 4 is lower for disadvantaged pupils than the national average, given the prior level of attainment at Key Stage 2, which suggests that the method currently used by Villiers Park may understate the true impact of the Scholars Programme.

This reasoning suggests that it would be better to assess the impact of the programme on GCSE attainment by comparing actual Key Stage 4 results for Scholars against the predicted results based on students from disadvantaged backgrounds only, given their Key Stage 2 results. The next section examines the effect of disadvantage on GCSE performance. We then consider how taking this into account affects the measured impact of the Scholars Programme.

[18] 'Attainment gaps between the most deprived and advantaged schools', The Sutton Trust, 2009, http://eprints.lse.ac.uk/23921/1/Attainment_gaps_between_the_most_deprived_and_advantaged_schools_%28summary%29.pdf.

[19] https://www.tandfonline.com/doi/full/10.1080/2331186X.2016.1178441

[20] https://www.tandfonline.com/doi/full/10.1080/2331186X.2016.1178441

[21] The attainment data in this section are based on 48 pupils that took their GCSEs in 2016 and 95 pupils from 2017.

[22] For more information about the attainment 8 methodology see: https://www.gov.uk/government/publications/progress-8-school-performance-measure

4.2 The impact of disadvantage on attainment at GCSE level

The DfE produces attainment data that allows us to examine the impact of disadvantage on GCSE results. These data show Key Stage 2 and GCSE results for all pupils sitting GCSEs in 2017 and for those from disadvantaged backgrounds.[23] This allows us to examine how those from disadvantaged backgrounds perform in their GCSEs relative to other pupils, controlling for previous attainment.

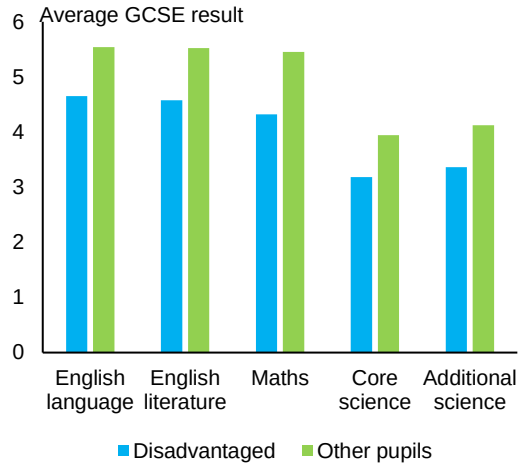
The DfE data suggest that disadvantage has a significant impact on educational attainment at GCSE level.

- On average, across all subjects, GCSE results of students from disadvantaged backgrounds were 1 grade lower than for non-disadvantaged pupils in 2017. They achieved lower grades across all subjects compared to other pupils (**Figure 4**) and were almost 4 times more likely to fail GCSE subjects than their peers (**Figure 5**). Those students from non-disadvantaged backgrounds were on average 3 times as likely to achieve the top grade in any subject.
- Disadvantage has a negative impact on attainment that is already evident at Key Stage 2. Average KS2 results are lower for disadvantaged pupils: the modal result for a pupil from a disadvantaged background is 4a, compared to 5c for other pupils.
- The gap between disadvantaged pupils and their peers continues to grow between KS2 and GCSE. That is evidenced by the fact that the average GCSE grades for disadvantaged pupils are lower than those for other pupils, even once we control for prior attainment (**Figure 6**); if we control for differences in Key Stage 2 attainment, the gap between disadvantaged and non-disadvantaged pupils narrows to around 0.4 of a grade (rather than 1 grade), but does not close completely.[24]
- It is the highest ability students from disadvantaged backgrounds that tend to fall behind most. Disadvantaged pupils that achieved the highest Key Stage 2 grades performed particularly poorly relative to their non-disadvantaged peers. For example, averaging across all subjects the disadvantaged pupils with a Key Stage 2 score of 2 scored 0.3 of a grade lower at GCSE compared to more than half a grade lower for those who scored 5 at KS 2 (**Figure 7**). This group of pupils, who are typically the biggest underachievers relative to their peers, are the group that Villiers Park aims to support.

[23] In the DfE attainment data, disadvantaged pupils are defined as those who were eligible for free school meals at any point in the previous six years or have been looked after by their local authority. These are the pupils who would have attracted the pupil premium when in year 11. This is a slightly narrower definition to the disadvantage selection criteria used by Villiers Park, which can also include young carers, those with a household income under a certain threshold and whose parents are not in professional occupations. NOTE: As it is not possible to obtain comparative pupil data using the Villiers Park definition of disadvantage, for the purposes of this research we have used the DfE definition.

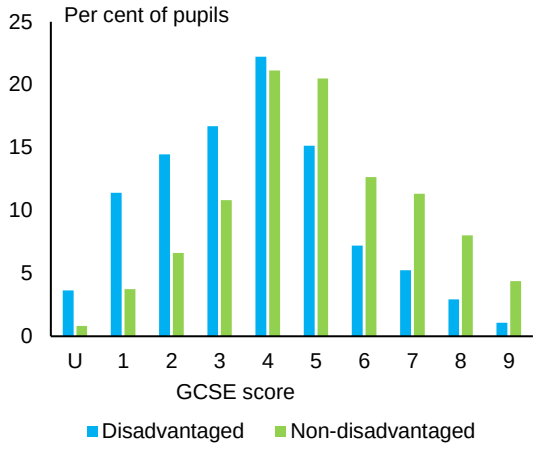
[24] English and Maths are graded on the reformed 9-1 scale. Science subjects are graded using the old A*-G system. GCSE results shown here are based on points awarded (which maps the A*-G scores to a 8.5-1 scale). An explanation of this approach can be found here: https://www.aqa.org.uk/about-us/what-we-do/policy/gcse-and-a-level-changes/attainment-8

Figure 4. Average attainment at GCSE by subject for disadvantaged and non-disadvantaged pupils



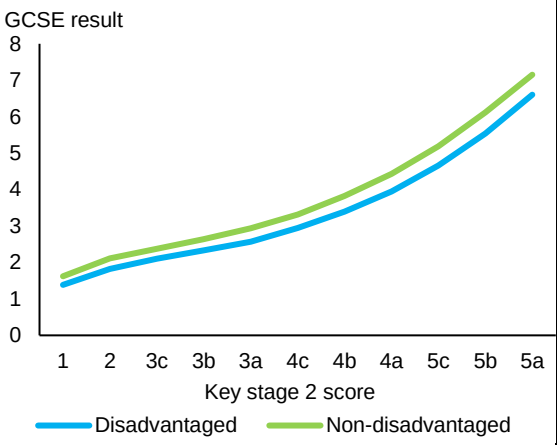
Source: DfE 2017 KS2 – KS4 Transition Matrices. English and Maths are graded on the reformed 9-1 scale. Science subjects are graded using the old A*-G system, converting to points scored.

Figure 5. Distribution of GCSE Maths grades for disadvantaged and non-disadvantaged pupils



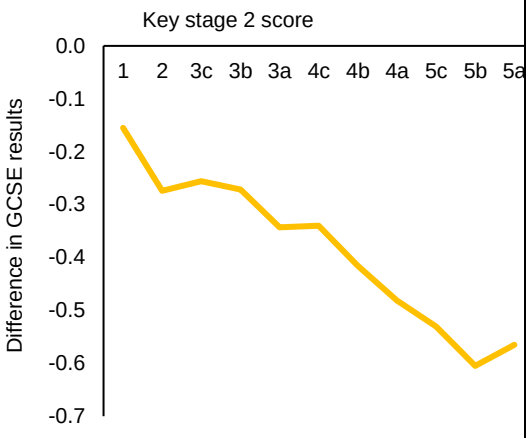
Source: DfE 2017 KS2 – KS4 Transition Matrices.

Figure 6. Average GCSE results for disadvantaged and non-disadvantaged pupils with a given KS2 score



Source: DfE 2017 KS2 – KS4 Transition Matrices. Average across all subjects, weighted by number of students participating in each subject. GCSE results shown on a points awarded basis.

Figure 7. Difference between average GCSE results for disadvantaged and non-disadvantage pupils with a given KS2 score



Source: DfE 2017 KS2 – KS4 Transition Matrices. Average across all subjects, weighted by number of students participating in each subject.

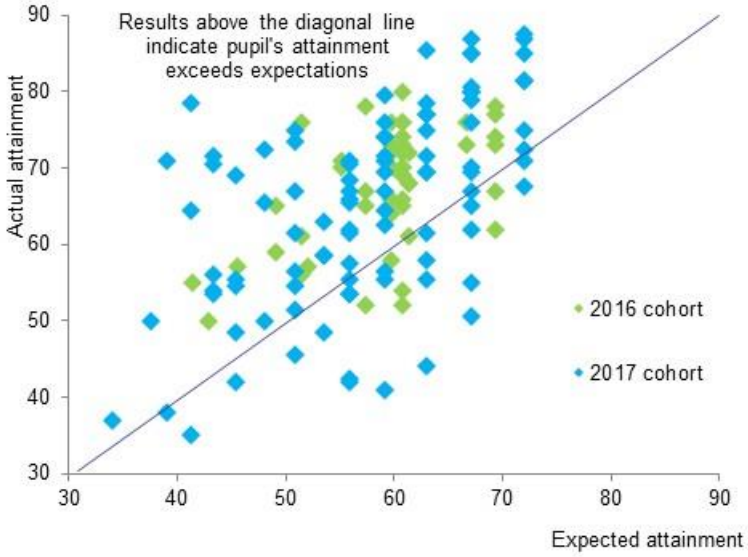
4.3 Adjusting for the impact of disadvantage on expected attainment at GCSE

On the basis of the evidence above, our revised approach to measuring GCSE attainment for the Scholars Programme adjusts the expected GCSE results used in the DfE's Attainment 8 methodology to allow for the fact that pupils are from a disadvantaged background. This requires

lowering the expected attainment of participants by the amount that disadvantaged pupils with a given KS2 grade were found to achieve relative to the national average. This should provide a more accurate estimate of the results we would have expected participants to achieve in the absence of the programme given their background.

We find evidence of a large positive impact of the Villiers Park programme on attainment at GCSE when comparing to other students from disadvantaged backgrounds. On average, pupils achieve over three quarters of a grade above the results that might have been expected had they not participated in the programme for each subject taken.[25] This is much higher than the third of a grade impact of the programme that would be estimated if comparing to the national average (Figure 8). Around 80% of pupils achieved results above those for the average pupil from a disadvantaged background with the same KS2 result (Table 1). If Villiers Park had no impact on results, we would only expect 50% of pupils to achieve results above this average.

Figure 8. GCSE attainment for Villiers Park Scholars compared to expectations based on the performance of other disadvantaged students



Source: Villiers Park and DfE Attainment 8 calculator. Actual attainment converts GCSE results to an attainment score using the DfE's attainment 8 methodology. Expected GCSE results calculated using the Attainment 8 calculator, adjusted for the estimated impact of disadvantage for each KS2 result (as shown in Figure 7).

[25] The estimates presented here and shown in Figure 8 use the impact of disadvantage found in the data for pupils completing GCSEs in 2017. We do not have estimates of the impact of disadvantage for other year cohorts. We therefore assume that the size of this effect is unlikely to change significantly from one year to the next and use this to adjust the expected attainment estimates for the 2016 cohort also. We have presented results for the average of the two cohorts here. The results are similar if we only use the 2017 pupil cohort.

Table 1 Comparison of different approaches to estimating impact of Villiers Park on GCSE results

	Estimated GCSE boost from Villiers Park Scholars Programme participation	% Of scholars above national average
Current method – comparing to national average	+0.33 grade higher	69%
Revised approach – comparing to other disadvantaged students	+0.79 grade higher	78%

We would qualify these findings by noting that this approach compares pupil results solely on the basis of disadvantage. There are additional factors that may affect pupil attainment, including gender and region, which are also likely to be explanatory factors in highlighting differences in educational attainment across student groups[26]. Gender was considered in this research but data on the impact of disadvantage on the achievement of girls compared to boys is not available. In annex 1 we discuss the potential to access the National Pupil Database (NPD) going forward in order to allow a fuller assessment of Villiers Park using other factors including disadvantage.

[26] There are also wider considerations e.g. impact of self selection bias, which are outside the scope of this research

5 The impact of Villiers Park on Key Stage 5 attainment

In this section we examine the impact of Villiers Park programmes on the Scholars' A-level results. It is important to note that this section relies on several assumptions that reflect the lack of available data for students at Key Stage 5.

As with GCSE results, Villiers Park currently assesses the impact of the Scholars Programme by comparing students' A-level results to the average grades achieved by pupils nationally with the same GCSE results. On this metric, Scholars achieve broadly in line with the national average at Key Stage 5. However, this is affected by the length of time that students have been in the Scholars Programme, with the average A-level score higher by over a third of a grade for those Scholars who entered the programme at age 14 compared to those who entered at age 16.

On the face of it the fact that pupils' A-level results are broadly in line with national averages given their GCSE results might suggest that the programme has little impact on attainment at A-level. However, comparing to national averages may not provide a true assessment of the impact of Villiers Park for two reasons:

- Firstly, as was the case when looking at GCSE results in the previous section, this does not adjust for the fact that these pupils are from a disadvantaged background. If pupils from low-income households also underperform at A-level then comparing to national averages understates the impact of the programme.
- Secondly, pupils that have participated in the programme over 4 years are also likely to have seen their GCSE results boosted as a result. This means that comparing their attainment to others with the same Key Stage 4 attainment does not include the impact of the programme on boosting Key Stage 4 attainment and this would need to be separately assessed.

We address these issues in the following two sections.

5.1 Impact of disadvantage on A-level results

As with GCSEs, there is a noticeable difference between average A-level results of pupils from low-income households and their peers, although the difference is less pronounced[27]. **Figure 9** shows the distribution of A-level results across the two groups in the 2015/16 school year. In 2016, 43% of disadvantaged students achieved a grade of B or above, compared to 54% of students from non-disadvantaged backgrounds. On average, disadvantaged students received one third of a grade less per subject compared to their non-disadvantaged peers. That gap was a little larger in 2017, at just above half a grade per subject. [28]

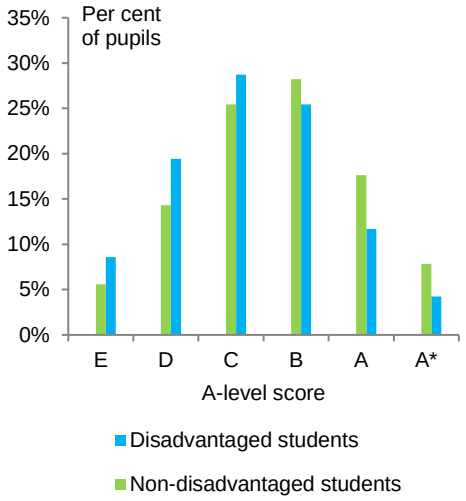
Due to data limitations it is not possible to be definitive about the extent to which the attainment of highly able disadvantaged students drops down relative to their more advantaged peers during Key Stage 5. We have therefore had to estimate the potential impact as a range. At one extreme, it could be that all of the difference in attainment at A-level reflects differences in GCSE scores and as such comparing Villiers Park pupils to national averages would be the appropriate approach. As highlighted above this would mean that Villiers Park pupils score broadly in line with the national average rising to a third of a grade higher for those students who stayed on the Scholars Programme for 4 years. At the other extreme, if the difference reflects deterioration in performance between GCSE and A-level, then the impact of Villiers Park would be an average of

[27] NOTE: The DfE provides less granular information on attainment at A-level than for GCSE. It produces a split of A-level results for pupils in England and Wales who are eligible for free school meals (FSM), a proxy for disadvantage, and those who are not. See the data releases SFR05/2017 from DfE website

[28] See the data release SFR03/2018 from DfE website

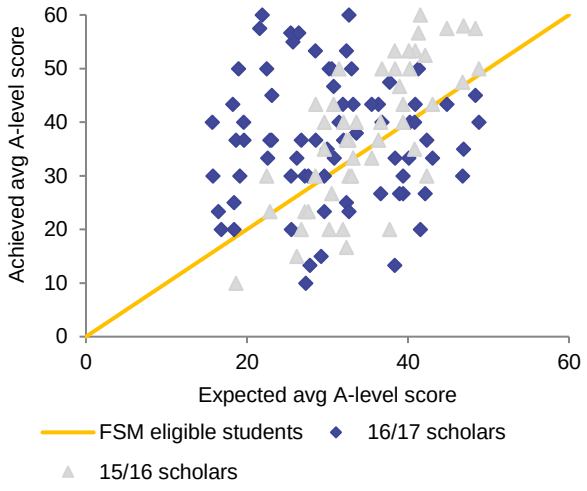
around half a grade per subject (**Figure 10**) – with the impact being over two thirds of a grade higher for those Scholars who stay on the programme for 4 years.

Figure 9. Distribution of A-level results amongst 2015/16 students in England and Wales



Source: DfE data on A level attainment by pupil characteristics in 2015/2016, Bank calculations. Disadvantaged students are defined as those who were eligible for Free School Meals in 2015/16

Figure 10. A-level attainment by Villiers Park Scholars, compared to FSM eligible students – assuming upper bound impact of disadvantage on attainment for a given GCSE grade



Source: Villiers Park data, DfE A-level ready reckoner, DfE data on A level attainment by pupil characteristics in 2015/2016, Bank calculations. Due to lack of data availability, the gap between disadvantaged and non-disadvantaged students in 2016/17 is a statistical extrapolation of the 2015/16 gap

This suggests that Villiers Park's impact on students at A-level ranges between achieving in line with the national average, to achieving a boost of up to two thirds of a grade higher than if they had not participated on the programme. Assuming that disadvantage does cause some deterioration in grades between GCSE and A-level, the fact that Villiers Park's pupils are achieving in line with the national average suggests that the programme makes some contribution to successfully eradicating the impact of disadvantage at Key Stage 5.

5.2 Estimating the full Impact of the Scholars Programme

The estimated impact of Villiers Park on A-level results outlined in the section above only captures the value added between GCSE and A-level. However, many pupils participated in the Scholars Programme for four years, starting in Year 10. As demonstrated in Section 4, on average those pupils are likely to have seen a boost in their GCSE results as a result of Villiers Park's interventions. This means that simply comparing their achievements to expected A-level results based on a given set of GCSEs does not adequately capture the benefit to the pupils over the 4-year period. Instead, we should compare pupil's attainment at A-level to expected results based on the GCSE grades they would have been expected to achieve in the absence of the programme.

We have therefore attempted to estimate below the full impact of the Scholars Programme on A-level results for pupils enrolled for four years on the programme. We would reiterate that data

limitations have meant that we have had to make a number of assumptions in order to provide this estimate.[29]

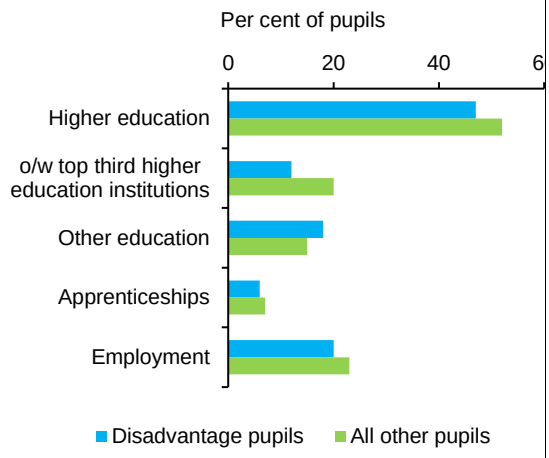
To estimate the impact, we consider the likely effect of the average boost to GCSE results that pupils receive for participating, on expected attainment at A-level. As shown in Section 4, we estimate that Scholars scored on average three quarters of a grade higher than would otherwise be expected given their disadvantaged background. Given the relationship between GCSE and A-level results explained above, we estimate that participation could have boosted A-level results by a little under two thirds of a grade per subject. If we focus on students participating on the programme over 4 years, we estimate that the Scholars Programme could have increased A-level grades by upwards of 1.5 grades per subject.

[29] For example, we do not have KS2 scores for pupils that have recently completed their A-levels. So we do not know the extent to which those pupils GCSE results may have benefited from the programme. Instead, we use those who completed GCSEs in 2015 and 2016 as a proxy.

6 Destinations of participants

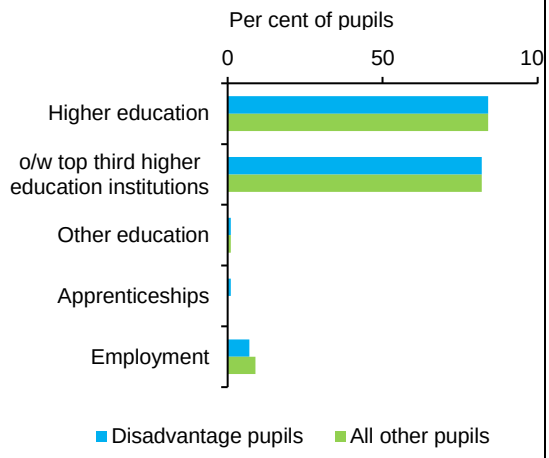
Department for Education data shows that disadvantaged pupils who are studying at Key Stage 5 are only a little less likely to attend higher education institutions than their peers: 47% of disadvantaged pupils attend university compared to 52% of other pupils (Figure 11). But more strikingly, disadvantaged pupils studying at Key Stage 5 are much less likely to attend institutions in the top third of higher institutions (12% v 20%). This is likely to have a marked negative impact on future earnings potential.[30]

Figure 11. Destinations of pupils after completing Key Stage 5 – national averages



Source: DFE Key Stage 5 destination measures 2015/16 (for the 2014/15 cohort).

Figure 12. Destinations of pupils after completing Key Stage 5 – those achieving AAB or better at A-level in selected subjects



[1]Includes students that achieve AAB or better, where at least two of those A-levels are in one of the following subjects: Biology, Chemistry, Physics, Mathematics, Further Mathematics, Geography, History, English Literature and Classical/Modern Languages.

Source: DFE Key Stage 5 destination measures 2015/16 (for the 2014/15 cohort)

The majority of participants in the Villiers Park programme go on to attend university. Around 80% of the cohort completing the programme in 2017, for which we have data, attended university[31]. Around 50% of Villiers Park's pupils (or two thirds of those who attended university) went on to study at a university in the top third of institutions. This is well above the national average for pupils from disadvantaged backgrounds outlined above.

It is likely that Villiers Park has a positive impact on destinations of participants through two key channels:

- Improving educational attainment: A key reason for the difference in destinations after leaving school between disadvantaged pupils and their peers appears to reflect differences

[30] For example, the Institute for Fiscal studies found that Russell Group universities increase earnings by around 10% more than the average degree, and the very top universities can increase earnings by more than 50% relative to the average. https://www.ifs.org.uk/publications/13059

[31] 73% of VP participants for which we have data for the 2013 and 2015 starting cohorts attended university. Another 6% pupils were taking a year out and intending to attend university in the following year.

in attainment. As discussed earlier, disadvantaged pupils are much less likely to achieve top grades at GCSE and A-level than other pupils, reducing the likelihood of them attending the top institutions. Figure 12 shows that if we only look at those pupils achieving the highest grades, then disadvantaged pupils are just as likely to attend university as their peers. Therefore raising academic achievement places pupils in the best position to gain access to a highly ranked university.

- Raising aspirations: There is also some evidence that Villiers Park improves participants' aspirations to go on to university. For example, in the 2017 Villiers Park survey (n=135), of 17 students who were initially unsure about plans to attend university when they started out on the programme, 11 had decided they did want to go to university during their time with Villiers Park. This would suggest that the programme had a positive influence on 65% of unsure students on their decision to pursue a university education.
- University choice: 64% of Scholars surveyed who had completed the programme in 2016 and 2017 said that the programme has made some or significant impact/influence on which universities to apply to (Scholars survey).

Annex 1 Comments on data collection

In this Annex, we comment on several aspects of data collection by Villiers Park:

- Potential refinements of student surveys.
- Use of mentor surveys.
- Using survey results to refine programme design.
- Collection of academic attainment data.

Potential refinements of student surveys

This section proposes some simple ways in which Villiers Park's surveys could potentially be adapted to better elicit accurate information from their students.

Preventing social desirability bias:

The way a question is worded can impact the truthfulness (and accuracy) of the given response. One reason for this is that respondents wish to give an answer which is socially desirable rather than honest.[32] For example, a question like "How much did you improve your confidence during your time on the programme?" may bias students to respond "I've improved somewhat" rather than "I have not improved at all". The latter answer might be taken as implying that their time on the programme was wasted, which is not socially desirable. Socially charged words such as "improvement" should be avoided.

Choosing the right scale:

Some questions ask respondents to select the answer which applies most – e.g., "I've seen significant improvement", "Some improvement", or "No improvement". Selecting the right scale is important in avoiding bias. For example, the above three-point response has two positive options ("significant improvement" and "some improvement"), while only having one neutral option ("no improvement") and no negative options. When positive options dominate, respondents may naturally be inclined to select a positive option, if they would not have done so, had they been given a wider choice of options. As a popular survey designer notes: *"Scales should span the entire range of responses".*[33]

An example of how to address both of these issues is outlined in the following question and response template:

> *Please select the option which best applies to you: "Confidence is a skill I consider a strength"*
>
> □*Strongly disagree* □*Disagree* □*Neither agree nor disagree* □*Agree* □*Strongly agree*

The scale in the example is balanced between positive and negative options, and spans all logically possible options, reducing the chance of bias.

Measuring change over time:

Collecting high-quality, reliable data is the first and most crucial step to analysing the effectiveness and cost-effectiveness of different interventions. Data can help a charity in two respects. First, it can be used to provide evidence to potential funders that the efforts of the charity produce the desired and advertised outcomes. Second, but just as important, data can be used to determine which interventions work and which do not. This information in turn can help

[32] https://link.springer.com/article/10.1007/s11135-011-9640-9

[33] https://www.surveymonkey.com/mp/likert-scale/?ut_source1=mp&ut_source2=survey_guidelines

decisions about which programmes should be allocated more resources and which should be abandoned/adapted.

Villiers Park administers questionnaires towards the end of the programme period. As noted above, many questions ask students to gauge how they have improved compared to when they started the programme. This method of asking about progress is likely to give biased results for two reasons. First, for some students many months and even years would have passed from the start of their programme to the moment when they are asked to fill out the survey. Students are very likely to have forgotten how they felt in the past. Second, when faced with difficult questions, people often exhibit substitution bias, answering a simpler question than the one actually asked.

For example, when asked *"How much did you improve your confidence during your time on the programme?"* students must first determine how confident they were the many months ago when they started the programme. They are unlikely to have an accurate memory of this. Second, they must decide how confident a person they are now. This is a difficult question and students are much more likely to substitute it for the easier "*How confident am I feeling today?"* If they have had a particularly bad day, their response is likely to be negatively biased.

A way around the two issues above is to ask students the same questions at different points during their Villiers Park experience. For example, Villiers Park can administer a survey of the type "*X is a strength: □Agree – □Disagree"* multiple times, once just before the programme starts, once or twice during the programme, and once at the end. This will make sure students do not have to rely on memory to reflect on how they felt before joining, and even if every response is affected by the "substitution bias", the bias will not affect any improvement/worsening exhibited over time.

Avoiding stereotype threat:

Thinking about prevailing social stereotypes can bias people in subtle ways. Being reminded that we belong to negatively stereotyped groups can impact our performance. In a widely cited study[34], researchers have shown that being reminded of the stereotype that '*women are bad at maths'* reduced their performance on difficult tests.

Reminding people of their gender or social situation (by asking them to put their name or sex on a survey) can cause them to subconsciously conform to negative stereotypes, rather than answering accurately. The current Villiers Park forms ask for name (associated with gender and sometimes social status), gender, and school attended as the first three questions. This may negatively impact the respondents' mind-set. One way around it is to ask students to fill out demographic information at the end of a survey or to omit demographic questions entirely (instead identifying students with a unique number, for example).

Mixing the order of questions:

Both the order of questions and the order of suggested responses can influence respondents. For example, in a Pew Research poll[35], more people supported "legal agreements" when they were asked about legal agreements after they asked whether they support gay marriage. Any unintended effects of question order may be overcome, in aggregate, if different students receive a different order of questions.

Use of mentor surveys

Many scholars noted the positive effect of mentors. Mentors seem to form close and trusted relationships with students over the course of the programme. One way to reduce bias in students' responses to survey questions is to ask mentors to fill out the same surveys for the

[34] https://www.sciencedirect.com/science/article/pii/S0022103198913737

[35] http://www.pewresearch.org/methodology/u-s-survey-research/questionnaire-design/#

students that they are responsible for. If the answers of a mentor and a student are very different on a number of questions, it might be that the responses of the student are not entirely reliable. On the other hand, if mentor and student scores are highly correlated, this suggests the student response is genuinely informative.

Using survey results to refine programme design

Data collected in student surveys could be potentially used to consider how programmes could be made more effective. Villiers Park already asks students about what can be improved or whether specific aspects of the student experience were useful (e.g., the e-mentoring scheme). However, due to budget constraints, often the question is not how to improve a given programme, but whether a given programme should be improved at the expense of another. To make student feedback more comparable across programmes, Villiers Park could split its programmes into distinct activities (similar to Skills Compass) and ask to students to rank how useful or enjoyable each activity was. This information can be used to assign an "effectiveness" score to different activities and compare them within and between programmes.

Figure 2 is an example of how comparability can benefit future decision-making. We note that over 20% of students felt "effective participation" was their biggest weakness at the start of the programme. Yet, only 14% of respondents thought that their "effective participation" skill improved the most during programme. Future programmes might focus on developing this skill further by identifying why students find it more difficult to improve on this skill during the programme period.

Collection of academic attainment data

Villiers Park now collects Key Stage 2 and GCSE results for all Scholars. This will mean larger samples sizes for future evaluation and will also remove the need to make as many assumptions to assess the impact of the Scholars Programme on A-level attainment.

A fuller assessment of the impact of educational attainment would also be possible if Villiers Park were able to access the National Pupil Database (NPD). The NPD contains data on all pupils in England throughout their school attendance, covering educational attainment and a range of other personal and school characteristics. If Villiers Park were able to access this data it would allow for a much fuller assessment of their impact. In particular, it would allow them to control for other factors that may affect pupils' attainment. In this report we have only been able to compare pupil's results to other disadvantaged pupils. However, other factors such as gender and the region of the schools are likely to be associated with differences in expectations of educational attainment. By controlling for these, Villiers Park would be able to better isolate the impact they are having.