The impact of interventions for widening access to higher education

A review of the evidence

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TASO — Transforming Access and Student Outcomes in Higher Education

About the authors

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Viola Salvestrini, a Senior Researcher at the Education Policy Institute. Before joining EPI, Viola worked as a research economist at the Universities and Colleges Employer Association, and at the London School of Economics. She led research on inequality, gender and ethnicity gaps in education and in the labour market. Viola is now completing her PhD at Queen Mary University.

About the Education Policy Institute

The Education Policy Institute is an independent, impartial, and evidence-based research institute that promotes high quality education outcomes, regardless of social background. We achieve this through data-led analysis, innovative research and high-profile events.

Education can have a transformative effect on the life chances of young people, enabling them to fulfil their potential, have successful careers, and grasp opportunities. As well as having a positive impact on the individual, good quality education and child wellbeing also promotes economic productivity and a cohesive society.

Through our research, we provide insight, commentary, and a constructive critique of education policy in England – shedding light on what is working and where further progress needs to be made. Our research and analysis spans a young person's journey from the early years through to entry to the labour market.

Our core research areas include:

- Benchmarking English Education
- School Performance, Admissions, and Capacity
- Early Years Development
- Vulnerable Learners and Social Mobility
- Accountability, Assessment, and Inspection
- Curriculum and Qualifications
- Teacher Supply and Quality
- Education Funding
- Higher Education, Further Education, and Skills

Our experienced and dedicated team works closely with academics, think tanks, and other research foundations and charities to shape the policy agenda.

Acknowledgements

Executive summary

Despite the ever-growing number of students who seek to attain a higher education degree, students from disadvantaged backgrounds are still less likely than their more privileged counterparts to progress to higher education, and to enroll in more selective universities. Much of this gap can be explained by differences in the grades students achieve in school or college. However, even when controlling for this prior attainment, the gap remains.

To address this situation, there has been a growing focus on widening access to higher education for young people from underrepresented groups. Indeed, in 2017-18 the higher education sector spent £248m on widening access. Yet despite this considerable investment and many years of widening participation policy, progress has been modest and there appears to be limited evidence on the effectiveness of the interventions carried out.

The goal of this review is to provide evidence on the interventions that have been shown to be most effective in improving participation for disadvantaged students, and to identify gaps in the current research base.

This review presents 92 studies that provide empirical evidence of the impact of outreach interventions on a broad range of outcomes, including aspirations towards, awareness of, and progression to, higher education for disadvantaged or underrepresented students. These activities include interventions that provide information, advice and guidance; mentoring and counselling; financial aid; summer schools; and interventions that combine two or more of these components, known as black box interventions.

Key findings

- Overall, there is still a lack of available evidence on the impact of outreach interventions on actual enrolment rates. Much of the existing evidence focusses on intermediate outcomes such as increased aspirations and awareness which may not always translate into actual enrolments.
- Most of the studies analysed found positive but modest effects. There are still some gaps in the research base, and the evidence often does not demonstrate causality; however, there has been an increased focus on robust evaluations.
- Much of the evidence is concentrated on students in their final years of secondary school and post-16 learners (A levels students in particular). Given that differences in attainment can explain much of the participation gap, and that these arise early, there is a lack of evidence on the impact of interventions happening earlier in the student life cycle.
- Most widening participation initiatives analysed were black box interventions combining several outreach components. These combined interventions seem to be associated with improvements in higher education outcomes but drawing definitive conclusions on the effectiveness of the single components is challenging.
- Providing financial aid to disadvantaged students is a high-cost widening participation intervention that has a small but positive effect on enrolment. The literature suggests that financial support is most successful when it is relatively easy to understand and apply for and efforts are made to raise awareness amongst potential beneficiaries.

- Interventions in the area of mentoring, counselling and role models has generally positive association with the outcomes considered. Qualitative and quantitative evidence suggests an increase in students' confidence to succeed in higher education, higher aspirations and a better understanding of the world of university, especially when the mentors can act as relatable role models for the mentees. Again, much of the literature analyses only changes to intermediate outcomes such as increased aspirations, confidence or awareness, rather than actual enrolments.
- Providing information, advice and guidance to underrepresented students during secondary school is a low-cost, light-touch tool to widen participation. The literature is largely based on fully scalable randomised control trials and indicates limited effects on both aspirations and actual enrolment. The more promising interventions are those that are tailored to the students, start early and are integrated into other forms of support, such as career advice and guidance.
- Summer schools are high-cost interventions that appear to be positively correlated with an increase in confidence and aspirations, but evidence on their effects on application to and acceptance by higher education institutions shows mixed results.

Recommendations

Based on the evidence gaps detailed in the report we identify the following priorities:

- To avoid overestimating the effectiveness of widening participation interventions, it is crucial to provide more causal evidence on the capacity of interventions to translate increased aspirations and awareness into a higher enrolment rate.
- There is a need for more robust research on the impact of black box interventions, with a focus on teasing out the separate effect of each component. Robust monitoring and evaluation should be built into these interventions from the start.
- There is not enough research focused on vulnerable but overlooked groups, such as mature students, carers and care leavers, some ethnic minority students and vocational students.
- More causal evidence on the effectiveness of summer schools should also be carried out. Where randomised control trials are not practical, other quasi-experimental techniques should be applied.
- More research on financial aid is recommended to ensure relevance to the English and UK context.
- The government and its delivery bodies must facilitate greater tracking of the progression outcomes of participants in widening participation interventions over time and between the school, college and the higher education sectors. This would provide improved evidence based on actual enrolments to higher education rather than on self-reported aspirations and attitudes only, and would allow for the development of more research on interventions happening earlier in the student life cycle.

Foreword: Education Policy Institue

For a number of years, the UK has seen a national consensus in favour of better access to higher education institutions for disadvantaged students.

However, for as long as this commitment has been in place, opinion on how best to improve access has often been divided.

A large part of the solution to widening participation must inevitably relate to improved attainment and narrower gaps in the earlier phases of education. Disadvantage gaps open early in life and widen as the journey through education continues. Higher education access for disadvantaged students will remain behind that of other students until significant progress is made in closing these gaps.

Nevertheless, there is still an important role for policy actions to improve access to universities close to the age of entry and to improve retention after entry. Different organisations within the higher education sector have invested significant effort and resources into delivering this goal.

This Education Policy Institute report, commissioned by the Centre for Transforming Access and Student Outcomes in Higher Education (TASO), highlights how too often, there is insufficient evidence to know which interventions offer the best value for money. Its findings, the result of a detailed review of nearly 100 studies, will help both universities and policymakers better understand which approaches are the most effective for improving disadvantaged students' outcomes.

Above all, the report provides a rallying call for further high-quality research to ensure that future policies and programmes are more focused on what works. We hope that it serves as a foundation from which to improve the existing UK evidence base on widening participation interventions.

Rt Hon. David Laws

Executive Chairman

Education Policy Institute

Foreword: TASO

Higher education in the UK has a history of commitment to ensuring the opportunities of tertiary study are fairly accessed by those who, as the Robbins Report put it, "are qualified by ability and attainment to pursue them and who wish to do so". Since the 1960s, and especially in the last decade, the sector has been enriching its understanding of how people think about higher education, whether they believe it is an option for them, and the barriers that might prevent them from taking it up.

This enriching understanding has been accompanied by a dramatic expansion in widening participation activity. However, equality gaps between the most and least advantaged students persist. Commitment, understanding and investment matter, but as a sector we also need evidence of what can work to open up higher education to underrepresented groups.

The Centre for Transforming Access and Student Outcomes in Higher Education (TASO) was established in 2019 to help drive this change. TASO will work with the sector to identify the best ways to eliminate equality gaps for underrepresented students in accessing, and succeeding in, higher education.

We commissioned the Education Policy Institute to collate and categorise the existing research on widening participation in higher education. We wanted to better understand the state of the evidence and what it shows about which activities have been proven to work, under what circumstances, and for whom.

In mapping out the research landscape, this report reveals the need for more high-quality evidence on what works in widening participation, especially for common activities such as multi-intervention outreach programmes, mentoring schemes and summer schools. Following guidance from the sector, TASO will now work to fill in these gaps.

I thank everyone who contributed evidence to the review, and who expressed their interest in being in involved with this research via our Theme Working Group and other deliberative mechanisms. I hope this report marks the start of a more comprehensive evidence base on what works, to act as a catalyst for change and spur on greater social mobility across the UK.

Susannah Hume

Director (Establishment Phase)

The Centre for Transforming Access and Student Outcomes (TASO)

Contents

1 - Introduction

Over recent decades, an increasing number of young people have progressed to higher education in England. However, despite this increase in participation, concerns about inequality of access to university remain. Previous research has found that socio-economically disadvantaged students, those who would be the first in their family to enter higher education, and those from some ethnic minority groups are less likely to apply and progress to higher education (Gorard et al., 2012; See et al., 2012; Younger et al., 2018). Those from the least deprived areas were 2.3 times more likely to enter higher education by age 20 than those in the most deprived area (UCAS, 2018). This gap is even wider at the most selective universities, to which students from the least deprived areas are 5.7 times more likely to progress compared to their counterparts from more deprived areas (UCAS, 2018).

Socio-economic differences in higher education participation can be largely attributed to the fact that disadvantaged pupils do not tend to achieve as highly in secondary school and college as their more advantaged counterparts (Chowdry et al., 2013). However, while prior academic attainment is certainly a key determinant of higher education participation, the causal process is not straightforward. If disadvantaged pupils feel that higher education is 'not for people like them', then their achievement in school may simply reflect anticipated barriers to participation in higher education, rather than the other way around (Chowdry et al., 2013). It was also shown that disadvantaged pupils are less likely to choose to study subjects required by the most selective universities, therefore contributing to lowering their chances of entering a high status institution (Harris, 2010).

Even after controlling for prior achievement, unexplained gaps in participation remain, especially for high-status institutions. Anders (2012) found that socio-economically disadvantaged students apply to university less often, and to Russell Group universities especially less often, than higher income students with the same level of attainment. Similarly, Boliver (2013) showed that ethnic minority students are less likely to receive an offer to study at a Russell Group institution even if they have the same qualifications and grades as other applicants.

This situation has led to a growing focus on widening participation – that is, improving access to higher education for young people from underrepresented groups. To promote this agenda, English universities wishing to charge the highest permitted rate of tuition fees are now required to develop programmes of activity in pursuit of widening participation targets. In 2017-18 the higher education sector spent £248m on widening access (Office for Students, 2019). However, despite this considerable investment and the accompanying policy reforms, progress has been modest (Church, 2018a; HEAT, 2018; Rizzica, 2019). Moreover, there is limited evidence on the effectiveness of the interventions carried out (Younger et al., 2018). Given the increasing levels of investment in widening participation activities, there is an urgent need for more research into which approaches are most effective and hence how this money can be used most efficiently.

This review was undertaken to provide evidence on the interventions that have been shown to be most effective in widening access and supporting student success and to identify gaps in the current research base. It was commissioned by the Centre for Transforming Access and Student Outcomes in

Higher Education (TASO-HE) to summarise the evidence around effective approaches in widening participation and inform evidence-based policies.

This review discusses 92 studies that provide empirical evidence of the impact of outreach interventions on a broad range of outcomes, including aspirations towards, awareness of, and access to higher education for disadvantaged or underrepresented students.[1] These activities include interventions that provide information, advice and guidance; mentoring and counselling; financial aid; summer schools; and interventions that combine two or more of these components (black box interventions).

In section 2 we describe the methodology used for this review, detailing the process used to identifying which research was included. In section 3 we provide an overview of the literature detailing the type, methodology and strength of the studies included. In section 4 we provide a detailed analysis of the most common types of interventions. Finally, in section 5, we focus on the general findings and on the evidence gaps and provide policy recommendations.

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[1] We are aware that recent discourse has suggested that aspirations of young people from disadvantaged background are not generally low and that school attainment accounts for nearly all the differences in participation rates between social groups (Harrison & Waller, 2018). As a result, there has been a steady shift towards raising expectations, rather than aspirations. However, as most of the literature on the effectiveness of interventions considers aspirations, we use that term instead of expectations.

2 - Methodology

To find and synthesise key sources related to widening participation in higher education we carried out a literature review of a variety of publications, from peer-reviewed journal articles to reports, books and policy briefs. We used a rapid evidence review methodology. This approach gave our work some of the structure and formality of a full systematic review, whilst also enabling the review to inform the next stage of the TASO-HE programme.

Research questions and objectives

This literature review was guided by the following research questions:

- How have interventions aimed at widening participation been studied in the literature?
- What interventions have had a positive impact on underrepresented students and their participation in higher education?
- What evidence gaps need to be filled?

For our conclusions and recommendations to be appropriate for the English/UK context, our analysis looked at the literature through the lenses of these additional questions:

- How is this literature relevant to the English/UK context?
- Is there similar research done in England/the UK? Are conclusions similar?

The specific objectives of this literature review were to:

- synthesise existing literature on what works (and what does not) in terms of widening participation in higher education;
- identify strength of evidence, impact and cost of intervention (where possible);
- identify evidence gaps in the existing literature.

Scope of the literature and inclusion/exclusion criteria

This literature review looks at interventions aimed at widening participation in higher education for students from disadvantaged or underrepresented groups, including lower-income students, those from disadvantaged socio-economic/demographic backgrounds, mature learners and students from ethnic minority groups.

The review covers interventions taking place in all earlier education phases leading up to entry to higher education, including for mature learners. We considered a wide range of widening participation outcomes, such as: increased aspirations, awareness and attainment; progression to higher education and high-tariff institutions; increased social and cultural capital; and skills development. The full list of student life-cycle stages and widening participation outcomes is summarised in Figure 1.

Figure 1: Student life-cycle stages and widening participation outcomes

Student life-cycle stages	Primary school learners
	Secondary school learners
	Post-16 learners (not in FE)
	Post-16 learners (in FE)
	Mature learners
	Other
Outcomes	Pre-entry HE aspiration / awareness raising: widening participation in HE
	Pre-entry HE aspiration / awareness raising: progression to 'high tariff' institution
	Pre-entry HE aspiration / awareness raising: recruitment to own institution
	Pre-entry attainment raising
	Pre-entry social / cultural capital
	Pre-entry skills development (including cognitive)
	Other

We considered quantitative, qualitative and mixed-methods evidence, with a focus on causal evidence where possible. Each study was classified according to three distinct types of impact evaluation: narrative, empirical enquiry and causality. These are summarised in Figure 2.

Figure 2: Types of evidence

	Description	Evidence	Claims
Type 1: Narrative	The impact evaluation provides a narrative or a coherent theory of change to motivate its selection of activities in the context of a coherent strategy.	Evidence of impact elsewhere and/or in the research literature on access and participation activity effectiveness or from existing evaluation results.	Coherent explanation of what it is done and why. Claims are research-based.
Type 2: Empirical Enquiry	The impact evaluation collects data on impact and reports evidence that those receiving an intervention have better outcomes but does not establish any direct causal effect.	Quantitative and/or qualitative evidence of a pre/post intervention change, or a difference compared to what might otherwise have happened.	Can demonstrate that interventions are associated with positive results.
Type 3: Causality	The impact evaluation methodology provides evidence of a causal effect of an intervention.	Quantitative and/or qualitative evidence of a pre/post treatment change on participants relative to an appropriate control or comparison group who did not take part in the intervention.	Can demonstrate that the intervention causes improvement using an appropriate control or comparison group.

Source: OfS.

Each study was also classified according to whether the methodology was quantitative, qualitative or mixed-methods and according to the target population. This include:

- Socio-economic / demographic disadvantaged learners (including low participation and/or deprived neighbourhood learners, free school meals learners, working class learners)
- Female learners
- Male learners
- BAME learners
- White learners
- Disabled learners
- Mature learners
- Vocational learners (e.g. BTEC)
- First generation learners
- Overseas learners
- Carers
- Care leavers
- Intersectional group

These inclusion and exclusion criteria were established before the search process and were developed to focus on the characteristics of interest in terms of population, interventions, outcomes, study design and timeframe. The full inclusion and exclusion criteria are reported in Figure A1.1 in Appendix A1.

Data collection and analysis

We carried out our searches using Google Scholar and Google search. This allowed our search to include not just peer-reviewed articles but also grey literature and literature reviews. We decided to use specific search words for the different elements of widening participation interventions (see Figure A1.2 in Appendix A1 for the full list of search terms) and ran a high number of searches. Since major student finance reforms were implemented in September 2012, we mainly focussed on studies published after that date to ensure relevance to the current context. We also excluded patents and citations, as well as texts not written in English.

Our compilation of sources consisted of a three-stage process.

First, a search and filtering process was created to identify the most relevant literature for our study within the scope described in the previous section. Given the large number of studies, we performed our search by title only. We initially performed three broad searches which returned many results. Then, we implemented a more restricted search aimed at identifying causal evidence. We also searched for specific programs that we know have been implemented in the UK. In doing so, we relaxed the timeframe constraint to include all relevant results. This first stage returned 2,888 sources.

Second, we reviewed abstracts. Studies that did not explicitly aim to analyse widening participation in depth or where increased participation for disadvantaged or underrepresented groups was not the specific outcome were excluded. This left us with 165 sources to analyse. We then used snowballing and reverse snowballing techniques through those works to identify further results. Finally, we included several evidence papers that were returned by widening participation experts

from UK Higher Education Institutions (HEIs) in a response to a call for evidence undertaken by TASO. This left us with 246 sources.

Finally, we applied the inclusion and exclusion criteria set out previously to identify those studies to be included in the literature review. A database was developed to summarise each source in terms of the intervention implemented to widen participation, the population targeted, and the outcomes considered. Ultimately, our analysis focused on 92 sources, including seven existing literature reviews: 44 reports, 32 peer-reviewed articles, seven non-peer reviewed articles and nine other sources (usually internal documents from HEIs).

After the sources were selected, they were categorised according to: the year of publication; type of evidence (narrative; empirical evidence; causality); provenance (peer-reviewed article; non peer-reviewed article; book/chapter; report); methodology (primarily quantitative; primarily qualitative; mixed methods); target education phase (e.g. primary; secondary; post 16; mature learners); outcome; type of intervention (e.g. mentoring); target population (e.g. disadvantaged students) and strength of evidence (weak evidence; developing evidence; best evidence).

This information was used to create a database where the results of our analysis were stored and coded. This allowed us to identify any patterns across evidence sources in terms of type of research, methodology used, and research findings, as well as to identify potential evidence gaps.

3 - Overview of the literature

The 92 sources analysed varied significantly with respect to the methodology used (Figure 3). Overall, 50 studies were quantitative, 21 were qualitative and 21 were mixed methods. The evidence sources were broadly split between the three types of evidence, with 26 narrative studies, 43 empirical enquiries and 23 causal studies.

Figure 3: Studies by methodology and evidence type

| | Methodology | | | |
Evidence type	Primarily quantitative	Primarily qualitative	Mixed-methods	Total
Narrative	4	19	3	**26**
Empirical enquiry	23	2	18	**43**
Causality	23			**23**
Total	**50**	**21**	**21**	**92**

Note: Literature reviews are included in this table. They are classified as narrative, while their methodology refers to that of the studies they summarise.

More than three quarters of all research included in the review were classified as at least developing evidence, with about a third being best evidence (Figure 4). Causal studies accounted for more than a quarter, and they were most likely to be considered stronger evidence. Most of the studies analysed found positive effects. Only one study found a negative impact, while two found no impact (Figure 5).

Figure 4: Evidence type and strength of evidence[2]

| | Evidence type | | | |
Strength	Narrative	Empirical enquiry	Causality	Total
Best evidence	2	11	16	29
Developing evidence	9	24	6	39
Weak evidence	8	8	1	17
Total	**19**	**43**	**23**	**85**

Figure 5: Impact by evidence type[3]

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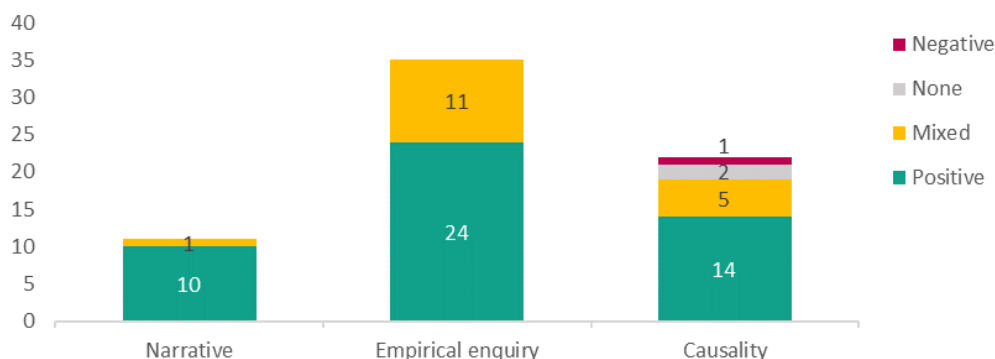
[2] Literature reviews are excluded from this table.

[3] Literature reviews and weak evidence are excluded from this chart.

Our review is structured according to the most common approaches to widen participation highlighted by the literature. These interventions group are: financial aid; mentoring, counselling and role models; information, advice and guidance (IAG); summer schools; black box interventions; and other interventions. In the following section literature reviews are excluded from the summary tables.

Financial aid

While there a large amount of literature on financial aid, not many of these studies were included in this review. This is because most of the literature was international, and we decided to focus on studies that were particularly rigorous and relevant to the UK context.

This subset of the literature appears to be very homogenous, mainly due to the nature of the interventions itself. Indeed, the programmes considered are based on the provision of scholarships, bursaries or fee waivers, which are – reasonably – targeted at post-16 students about to proceed to higher education. Similarly, since aid programmes have assignment rules that are very clearly defined, they lend themselves well to a causal evaluation.

As expected, interventions in this group were targeted uniquely at socio-economically disadvantaged students. All interventions looked at enrolment rates as outcome.

Figure 6: Financial aid: evidence type and strength of evidence

	Evidence type			
Strength	Narrative	Empirical enquiry	Causality	**Total**
Best evidence			6	**6**
Developing evidence			1	**1**
Weak evidence				
Total			**7**	**7**

Figure 7: Financial aid: interventions by outcome type
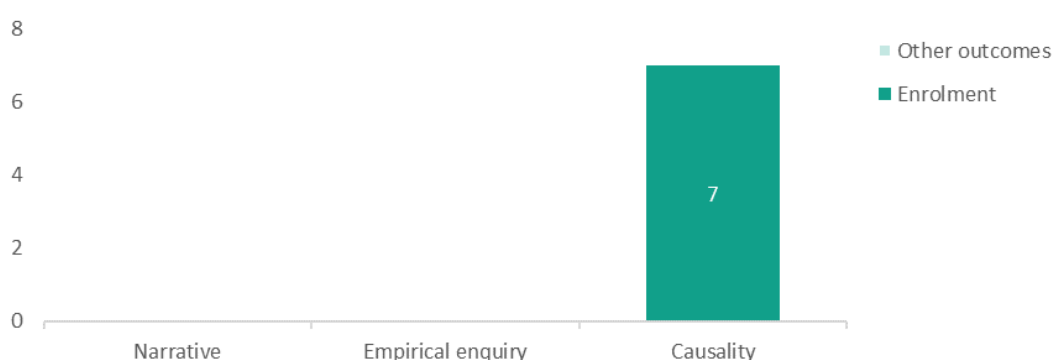
Mentoring, counselling and role models

Other than black box interventions, mentoring, counselling and role models is the largest category in the literature analysed.

The interventions covered in this stream of research are generally high-quality, with only two studies classifying as weak evidence. The range of methodology used varied, with qualitative and quantitative evidence similarly represented. While most of the literature analysed were UK-focused, the few studies estimating the causal impact of mentoring, counselling and role models were

evaluations of US programmes. Almost all the interventions analysed were targeted at socio-economically disadvantaged students in their final years of high school. While narrative studies and much of the empirical enquiries looked at intermediate outcomes, such as aspirations and awareness, all causal evaluations focused on enrolment rates.

Figure 8: Mentoring, counselling and role models: evidence type and strength of evidence

Strength	Evidence type			Total
	Narrative	Empirical enquiry	Causality	
Best evidence	1	3	4	**8**
Developing evidence	2	5	1	**8**
Weak evidence	1	1		**2**
Total	**4**	**9**	**5**	**18**

Figure 9: Mentoring, counselling and role models: interventions by outcome type
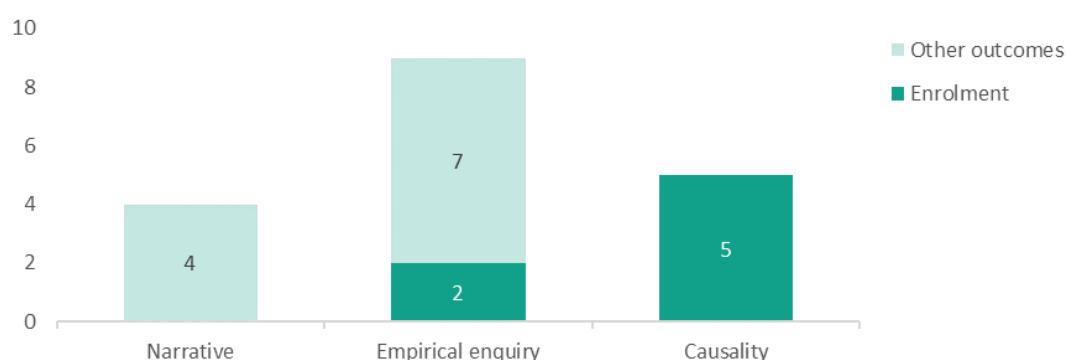

Information, advice and guidance

In the context of widening participation, information, advice and guidance (IAG) is used as an umbrella term that refers to a wide range of activities and interventions that help students to make informed decisions about their future. Since socio-economically disadvantaged students might have a less clear understanding of the costs and benefits of higher education, most of the interventions analysed were targeted to this group, although first-generation and ethnic minority learners were also represented. The studies included in this review were a balanced mix of UK and international interventions, and they were targeted at both pre- and post-16 students.

Much of the interventions analysed were evaluated with randomised controlled trials, where information on costs and benefits of higher education, application process and financial aid were provided to a randomly selected group of students. This is due to the nature of the interventions: being low-cost, light-touch and easily implemented, they are suitable for experimental evaluations. With few exceptions, the studies focused on enrolment or application rates as outcomes.

Figure 10: Information, advice and guidance: evidence type and strength of evidence

Strength	Evidence type			Total
	Narrative	Empirical enquiry	Causality	
Best evidence		1	6	**7**
Developing evidence			3	**3**
Weak evidence				
Total		**1**	**9**	**10**

Figure 11: Information, advice and guidance: interventions by outcome type
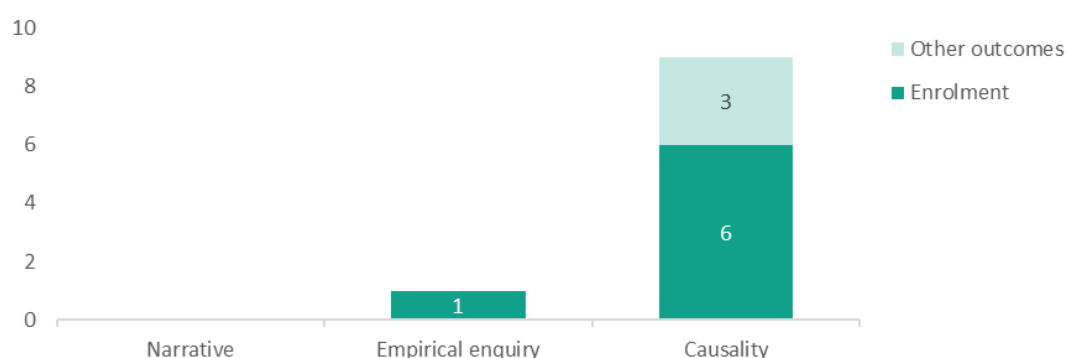

Summer schools

While summer schools are a widely used activity for widening participation in UK higher education, evidence on their effectiveness is rather limited. Among the literature analysed, no study implemented a rigorous methodology aimed at uncovering causality. However, only two studies were classified as weak evidence, with most classified as developing or best strength empirical enquiries.

The interventions we analysed were mostly UK-based and targeted at secondary school pupils from a wide range of underrepresented groups, including low-income students, disabled students, carers and care leavers, and mainly focused on intermediate outcomes such as aspirations, awareness and intention to enter higher education.

Figure 12: Summer schools: evidence type and strength of evidence

	Evidence type			
Strength	Narrative	Empirical enquiry	Causality	**Total**
Best evidence		3		**3**
Developing evidence	2	6		**8**
Weak evidence		2		**2**
Total	**2**	**11**		**13**

Figure 13: Summer schools: interventions by outcome type
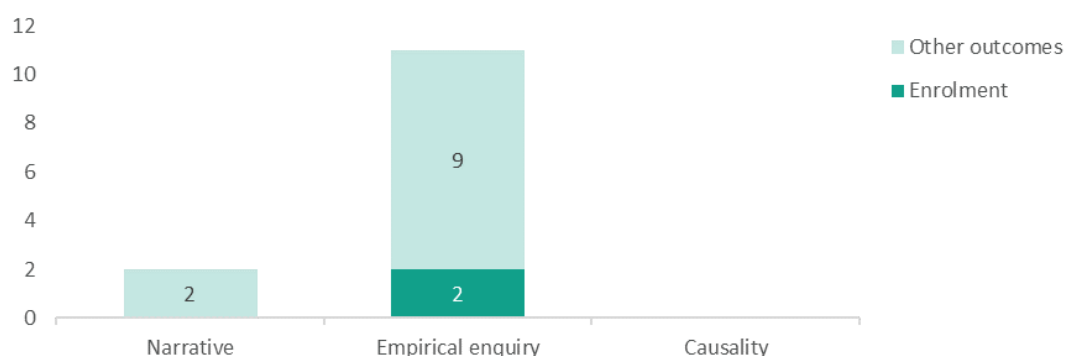
Black box interventions

Most of the literature analysed covered interventions offering a bundle of components, the effect of which is not often possible to disentangle. These interventions were mostly evaluated with qualitative and quantitative methodologies providing correlational and contextual evidence. While

these approaches are unable to uncover any causal impact of these programmes, they may provide an insight into the components that were mostly found useful by participants. Moreover, providing a rigorous, causal evaluation of these intervention is not always easy – and, in some cases, not even feasible – due to their large-scale and multi-faceted nature.

The literature analysed varied by strength of evidence: the majority was classified as developing evidence, with an equal proportion of studies being best and weak evidence. This reflects the fact that these studies show a great variability in terms of interventions, audience, pupils' age at intervention and intended outcomes. In particular, the target population vary substantially, from low-income students, to ethnic minority students, care leavers, carers, disabled learners, mature and vocational learners, and some intersectional groups (such as white working-class boys). However, there was little geographical variation, with most studies focusing on the UK.

The proportion of studies having enrolment rates as an outcome increased substantially when moving towards more robust evaluations. While almost all narrative studies looked at intermediate outcomes, nearly half of empirical enquiries and all causal evaluations focused on enrolment rates.

Figure 14: Black box interventions: evidence type and strength of evidence

| | Evidence type | | | |
Strength	Narrative	Empirical enquiry	Causality	Total
Best evidence	1	5	2	**8**
Developing evidence	3	10	1	**14**
Weak evidence	6	1	1	**8**
Total	**10**	**16**	**4**	**30**

Figure 15: Black box interventions by outcome type
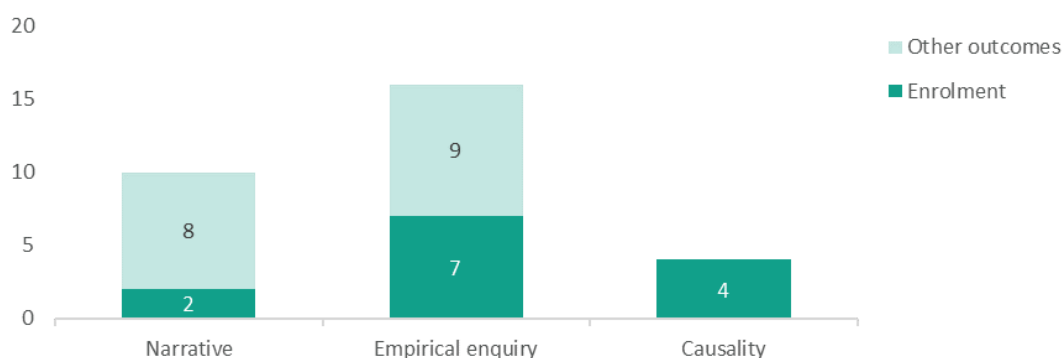
Other interventions

Other interventions found in the literature include: campus visits; subject tasters; foundation courses; library outreach programmes; conferences and workshops. Interventions in this group were mainly targeted at students from socio-economically disadvantaged backgrounds, disabled learners, mature learners, carers and care leavers, and spanned all stages of the students' life cycle. Most studies were evaluations of UK programmes, and only three studies evaluated the impact of the intervention analysed on enrolment rates.

Figure 16: Other interventions: evidence type and strength of evidence

	Evidence type			
Strength	Narrative	Empirical enquiry	Causality	**Total**
Best evidence			1	**1**
Developing evidence	2	3		**5**
Weak evidence	1	4		**5**
Total	**3**	**7**	**1**	**11**

Figure 17: Other interventions by outcome type
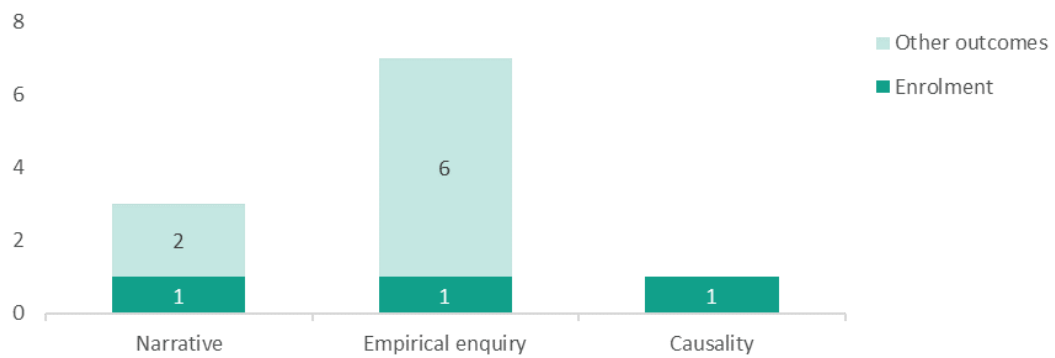
4 - Analysis of individual interventions

Financial aid

Figure 18: Financial aid: impact by evidence type[4]

Financial barriers are often at the core of concerns about higher education opportunities for disadvantaged students. In some countries, the direct costs of higher education attendance have risen dramatically over the last years and have raised public concern about affordability (Herbaut 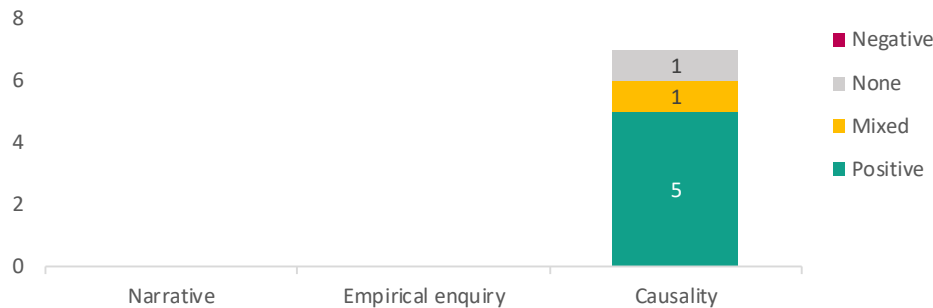& Geven, 2019, p. 4; OECD, 2019; Britton et al., 2019). To lower the financial barriers to post-secondary education for low-income students, many countries operate broad-based financial aid programs that provide tuition waivers and cash transfers (either through bursaries, grants or scholarships). [5] By reducing the costs of university attendance, these programmes typically seek to persuade low-income families to invest in their children's higher education, thus reducing inequalities.

Despite the considerable public spending intended to increase participation in higher education, the effectiveness of financial aids is still unclear. Evidence on both merit-based and need-based aid is mixed. The literature suggests that merit-based grants can have negative effects for disadvantaged students, and only have a positive effect when they are targeted at high-achieving, low-income students (Herbaut & Geven, 2019). A study reviewed by Younger, Gascoine, Menzies, and Torgerson (2018) found that while being awarded a merit-based scholarship did have some positive impact on recipients, they were rarely awarded to low-income students and thus did not have a positive impact on their participation. Many studies on the effect of need-based grants found small positive effects on enrolment, but in some cases these effects were not statistically significant. Exploiting the income cut-off to determine eligibility through a regression discontinuity approach, a US study from Castleman and Long (2016) found that eligibility for a $1,300 grant led to a 3 percentage points (though not statistically significant) increase in enrolment. This increase was driven almost entirely by an increase in enrolment in four-year institutions (only marginally statistically significant), rather than two-year colleges available in the US. Another study (cited in Herbaut & Geven, 2019) found a small but statistically significant effect of grant aid on enrolment: exploiting a reform of a grant aid scheme in Ohio that made the plan more generous than the previous one, the authors found that for each additional $750 of grant received, low-income students were 1.5 percentage points more likely to enrol at public four-year colleges.

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[4] Literature reviews and weak evidence are excluded from this chart.

[5] A type of aid that has little requirements and provides tuition waivers and/or scholarships to a large number of students.

Evidence from Europe seems to confirm these patterns. Fack and Grenet (2015) studied the impact of France's largest financial aid program on college enrolment decisions, retention, and graduation rates of low-income students. Using a regression discontinuity approach, the authors found enrolment rates to be unaffected by fee waivers, but that the provision of €1,500 cash allowances for living costs increased students' enrolment rates by nearly 3 percentage points. A study on the effect of bursaries in Denmark (cited in J. Moore et al., 2013) also found a positive impact of bursaries on participation, although to a lower level (1.35 percentage points). On the other hand, a study cited in Herbaut and Geven (2019) found that in Germany a 10 per cent increase in the federal students' financial assistance scheme led to a small, albeit not statistically significant, increase in enrolment rates for low-income students.

It is worth noting, however, that in the European countries considered the cost of attending higher education system and the levels of student debt are very low in comparison to England, where tuition fees are relatively high and there is focus on loans for living costs. Moreover, there is a severe lack of evidence on the effectiveness of student aid in encouraging higher education participation for the UK. A notable exception is Dearden, Fitzsimons, and Wyness (2014), who analysed the introduction of large increases in maintenance grants using a difference-in-difference approach and found positive effects on higher education participation. The scale of impact was in line with findings from the US, with a £1,000 increase per year resulting in an increase in participation of around 4 percentage points.

While financial aid can be effective in increasing enrolment, not all aid programs are equally so, and the complexity of the financial aid application process can be itself a significant barrier to higher education access (Scott-Clayton, 2015). Hoxby and Turner (2013) randomly provided students with no-paperwork college application fee waivers, and observed that fee waivers tended to have positive effects on application behaviour: however, while students were induced to apply to more institutions as a result of the intervention, they were not necessarily applying to universities that were a good match for them.

Other evidence on the potential power of simplification comes from the so-called promise scholarships, a popular policy strategy to improve college affordability and access by providing geographically targeted financial aid to students meeting basic academic criteria. These scholarships are particularly popular in the US, where many students choose to study at more local higher education institutions, especially for those from disadvantaged backgrounds (Iriti et al., 2018). Page, Iriti, Lowry, and Anthony (2018) investigated the causal effect of the Pittsburgh Promise on students' enrolment and persistence, using regression discontinuity and difference-in-differences analyses. As a result of Promise eligibility, Pittsburgh Public School graduates were approximately 5 percentage points more likely to enrol in college, particularly in four-year institutions; 10 percentage points more likely to select an institution within Pennsylvania; and 4 to 7 percentage points more likely to enrol into a second year of postsecondary education. On the other hand, an earlier study from Daugherty & Gonzalez (2016) found no clear evidence on the effects of the New Haven Promise on students' enrolment. While the methodology used was the same as in Iriti et al. (2018), there were data limitations that prevented the authors from precisely determining New Haven Promise eligibility status.

Even when financial constraints do not affect university enrolment decisions, financial aid may still influence students' behaviour relative to other attributes of their choice, allowing for a better match

with their subject and institution preferences. An example is given by Vergolini and Zanini (2015), who analysed the effects a generous merit-based scholarship for low-income students in Italy. Using a regression discontinuity design, the authors found no effect on university enrolment, but a large positive impact on the decision to enrol outside the province of residence, especially in fields of study not covered by the local university. In the UK, the literature expressed concerns about the fact that highly selective institutions can afford to have higher bursaries and therefore have the potential to distort students' choices towards these universities, even when they do not represent a good match for the students (J. Moore et al., 2013). However, in their review of the literature J. Moore et al. (2013) found no evidence that high-achieving students have switched their choice to a more selective institution because of a higher financial award. Nonetheless, the research considered was produced before the increase in the maximum tuition fees – more evidence is needed to understand whether this is still the case in the current financial context.

Conclusions

The studies analysed in this section are rigorous, causal evaluations that find positive, albeit in some cases small, effects of financial aid on enrolment. The literature shows that by lowering the price of higher education and alleviating financial pressures, financial aid can stimulate enrolment and allow for better matches with students' subject and institution preferences. Such literature also suggests that financial support is most successful when it is relatively easy to understand and apply for and efforts are made to raise awareness amongst potential beneficiaries. Moreover, the evidence analysed was mainly international, so how the findings would translate to the UK context is not clear. On the one hand, in the United States and in other countries the cost of higher education is higher, and process for applying for financial aid more complicated. On the other hand, costs are increasing in the UK and the system is becoming increasingly complex, as each higher education institution has its own rules for the targeting of bursaries and scholarship, and for the amount received varies greatly. Therefore, interventions aimed at supporting students and families to alleviate their financial burden and navigate the financial aid landscape may have a positive impact. Given the high-cost nature of these initiatives, more research is needed to understand what the implications for this type of interventions are in the UK.

Mentoring, counselling and role models

Figure 19: Mentoring, counselling and role models: impact by evidence type[6]
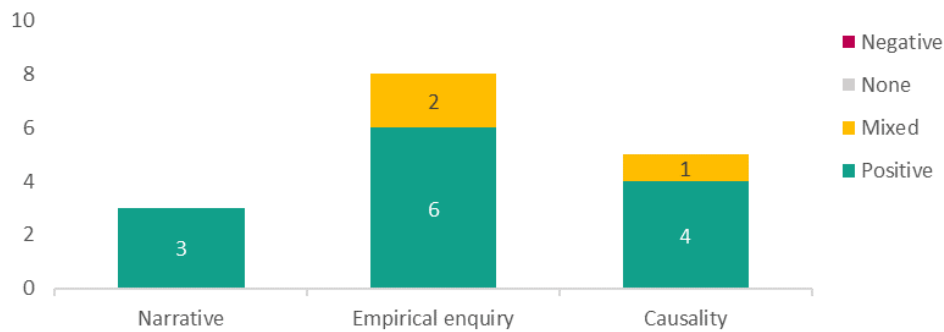
The barriers to progression faced by underrepresented students are not only financial ones. Students' perception of how they will fit into the higher education environment, and their confidence in navigating a system they and their families have little experience of, may also act as a barrier. Mentoring, counselling and role models are thought to be a valuable way to raise young peoples' aspirations to attend higher education, foster a sense of belonging and support students in dealing with the barriers specific to their disadvantage.

Mentoring programs can direct influence young people's confidence and motivation and provide necessary advocacy and support to vulnerable and underrepresented students. For example, students exposed to the Aimhigher Personal Advisor Programme, a one-to-one mentoring and support programme, expressed an increased awareness of and aspirations towards studying higher education, and highly valued the possibility of having someone to listen to their concerns (Kerrigan & Carpenter, 2009).

Part of the appeal of mentoring is linked to the intention of enabling less advantaged children to develop relationships with older, more experienced people in the way that many advantaged children are able to do informally (Cummings et al., 2012). In a case study analysis of the Intergenerational Mentoring Network in Scotland, Hunter, Wilson, and McArthur (2018) found that intergenerational mentoring can play a crucial role in supporting disadvantaged young people in their journey into higher education. Firstly, mentors with a breadth of industry experience and established contacts can provide disadvantaged and first-generation young people with an essential source of middle-class social and cultural capital that is absent in their own networks. Secondly, through their extensive life and career experience, older mentors are able to assist young people with the knowledge and understanding necessary for a successful application to university and orientation toward a career (Hunter et al., 2018). These findings are in line with Spath, Pearce, and Martyres (2018) and Lawson, Hunt, Goodwin, and Colley (2019), who found that connecting disadvantaged students with an individual working in their sector of interest is associated with increased aspirations, social and human capital, and confident decision-making.

Expert mentoring appears to be an effective intervention not only for raising aspirations and awareness, but also for supporting students from low participation groups to progress to the most prestigious institutions. In a pilot project run by Causeway Education (2019b), expert mentors

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[6] Literature reviews and weak evidence are excluded from this chart.

worked with their mentees through a personalised curriculum to build their knowledge of higher education, navigate the application processes, and support them to overcome any other actual or perceived challenges. Results show that mentees were more likely to receive an offer from a higher tariff institution than non-participants, showing an increased in ambition. While the results are encouraging, more details on the methodology used are needed to make any conclusion on the effectiveness of the program.

While most of the literature analysed were UK-focused, the few studies estimating the causal impact of mentoring, counselling and role models were evaluations of US programmes. These evaluations show that mentoring programs targeting students in their final year of high school had positive results. To mitigate 'summer melt', the phenomenon that students who previously planned to enrol in college in the year following high school then failed to do so, Castleman, Arnold and Wartman (2012) conducted an experimental study. Active college counselling was assigned to a randomly selected group of recent low-income graduates from small, urban high schools in Providence, Rhode Island. School-based counsellors worked with treated students throughout the summer to address both practical and emotional or aspirational barriers to higher education. The authors compared their college enrolment rates and patterns to those of a randomly selected control group of graduates from the same high schools who did not receive active counsellor outreach, and found strong, positive effects on both the rate and quality of college enrolment. This effect was potentially diluted by the fact that the control group also received some counselling (but without the active outreach component). The external validity of this study, however, is limited: participating schools were schools with a particular focus on personal growth and 'real-world learning', and students attending them might have been more motivated and responsive to outreach than the average urban high school student, not to mention English students.

Another US intervention, modelled on the one implemented by Castleman et al. (2012) but employing similar-age college students to provide summer outreach and support for students intending to go to college, increased four-year college enrolment (Castleman & Page, 2015). Intensive college counselling appears to be effective also for less academically able students or for students who have not progressed far in the college application process. Carrell and Sacerdote (2017) found that providing high school students with counselling during their senior year to help them with the application process had a positive effect on college enrolment, largely acting as a substitute for the potentially scarce resource of parental help or skill. Counselling in the final year of high school also proved to be efficient in diverting disadvantaged students from short programs and encouraging them to enrol in four-year institutions (Castleman & Goodman, 2018).

Coaching interventions focused on facilitating the development of pro-academic behaviours, increasing self-awareness, and exploring career and/or higher education options, have also proven successful. In the evaluation of a random assignment college access and career coaching program, S. Moore, Raney, Ritter, and Higgins (2015) found that while treated students did not have better academic outcomes than their control group peers, they exhibited significantly higher scores on non-cognitive outcomes and significantly higher rates of college enrolment.

The use of role models to encourage participation for underrepresented groups appears to be a key and widespread component of interventions led by higher education institutions. A study of first and second year medical students (cited in J. Moore et al., 2013) highlights the importance for role modelling and suggests that widening participation programmes need to choose positive role

models and to intervene early. The role of higher education students as positive role models in widening participation outreach programmes is analysed by Sanders and Higham (2012) in their review of the Widening Access and Student Retention and Success (WASRS) national programmes archive. The authors found that higher education students can provide learners with a role model from which to develop more accurate perceptions of higher education and challenge negative stereotypes. Similarly, the relationship with student ambassadors and mentors was key to increase knowledge and awareness of higher education, confidence, motivation and attitudes towards education for Aimhigher Plus disadvantaged learners (*Aimhigher West Midlands: Impact case studies—Full report.*, 2019). A large scale UK trial found that receiving an inspirational letter from university students with similar backgrounds had a substantial effect on the proportion of students who might have not applied to selective universities applying to and accepting a place at a Russell Group university (M. Sanders et al., 2017).

Current or past students can positively affect the aspirations, skills, and attitudes of underrepresented young people, especially when learners and higher education students engage in sustained and meaningful relationships and when higher education students are effectively selected, trained and supported for their role (Aimhigher Birmingham and Solihull, 2010; J. Sanders & Higham, 2012; O'Sullivan et al., 2017). In an analysis of a mentoring programme in Ireland designed to facilitate the transfer of higher education knowledge through identifiable role models, O'Sullivan et al. (2017) found that the quality of the mentoring relationship and the number of mentoring sessions received had positive effects on students' confidence to succeed in college, college application efficacy and college-going aspirations. Moreover, thematic analysis revealed that the mentoring relationship was improved when the mentor was from a similar background as the mentee and was 'open and fun'. These findings are in line with results from Koshy and Smith (2019) and Jeavans and Jenkins (2017), who found that undergraduate mentors from the same backgrounds or gender as their mentees can act as relatable role models, improving students aspirations and confidence and shattering stereotypes.

Although the literature generally points to positive effects of the use of higher education students as role models and mentors, it also contains examples of unsuccessful relationships where higher education students have failed to foster aspirations and increase participation. An example is given by a classroom support scheme that placed university students in local secondary schools as 'tutors' to provide positive role models for young people and encourage them to consider higher education as an option. Although the scheme improved the learning environment within the classroom, there was little evidence that the tutors increased awareness of higher education or that the tutors provided positive role models for the pupils (Mackintosh & Edwards, 2018). Mixed results emerge also from the evaluation of a mentoring partnership where post-16 students were matched with undergraduate mentors (Spath et al., 2018). While the authors found that the intervention was associated with increased social capital, human capital, and confident decision-making, it was also associated with decreased self-efficacy. Instances where higher education students were unprepared or untrained, lacked the confidence to deliver, or showed a lack of consistency and commitment, resulted in a negative mentoring experience (J. Sanders & Higham, 2012; O'Sullivan et al., 2017).

Conclusions

Most of the interventions covered in this stream of research had a positive impact on the outcomes considered. Qualitative evidence suggests that mentoring, counselling and role models results in an increase in students' confidence to succeed in higher education and a better understanding of the world of university. Quantitative data also show that mentored students display higher aspirations and application rates to selective institutions. However, causal evidence of the effectiveness of these interventions, especially in the UK, is very limited. Most importantly, most of the literature analysed look at intermediate outcomes (such as increased aspirations, confidence or awareness), rather than actual enrolment. While raising aspirations for disadvantaged or underrepresented students is paramount to encourage them to progress to higher education, overlooking the actual application and enrolment rates resulting from mentoring interventions could lead to overestimating their effectiveness.

Information, advice and guidance

Figure 20: Information, advice and guidance: impact by evidence type[7]
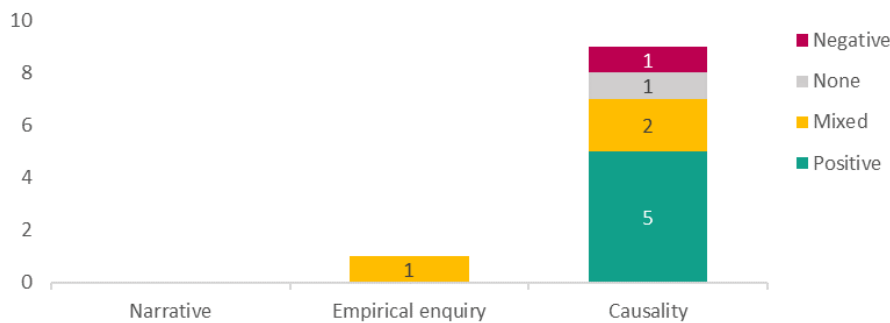
In the context of widening participation, information, advice and guidance (IAG) is used as an umbrella term that refers to a wide range of activities and interventions that help students to make informed decisions about their future. Providing information and advice may also be part of interventions in the mentoring, counselling and role models area. However, while such interventions are intended to increase aspiration and awareness and provided on a one-to-one basis, IAG interventions usually aim at filling a specific information gap and often sit within a wider context of careers guidance.

IAG interventions have been shown to be a key and established feature of widening participation outreach programmes. In their review of the literature, J. Moore, Sanders, and Higham (2013) found that most IAG interventions are embedded into wider outreach activities. For example, delivery of IAG activities was a core feature of both Aimhigher and Lifelong Learning Partnerships, and it was also embedded in the Sutton Trust summer school programme (J. Moore et al., 2013).

In this section, we focus on evidence related to discrete IAG programmes targeted at under-represented groups. Students from underrepresented groups may have limited experience of the higher education system and may therefore have a less clear understanding of the costs and benefits of going to university. While it is well established that students and parents from all backgrounds tend to overestimate the cost of higher education (see, for example, Grodsky & Jones, 2007), understanding the true cost of university might be particularly difficult for low-income families, as stated tuitions fees have increased in England while the amount of financial aid has become more generous (Dynarski & Scott-Clayton, 2013; Herbaut & Geven, 2019).

In recent years, a growing body of research has focused on the role of information barriers for participation in higher education. All the literature analysed derives from randomised controlled trials, where information on costs and benefits of higher education, application process and financial aid is provided to a randomly selected group of students. Most of the literature included in this review (with some notable exceptions mentioned below) was able to look only at the impact of IAG interventions on aspirations and expectations, rather than on actual enrolment behaviour.

The literature analysed suggests that the provision of easily accessible information about university matters, especially for students who are initially uncertain about whether they want to participate in higher education and/or uncertain about whether they can afford it. M. Sanders et al. (2018)

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[7] Literature reviews and weak evidence are excluded from this chart.

designed and evaluated an intervention in the South West of England, where existing university undergraduates visited local schools and colleges to inform students on the true costs and benefits of going to university. Although limited by data availability and sample size, the authors found a significant effect on the likelihood of students successfully applying to selective Russell Group universities. The effects were largest for students attending further education colleges, which typically cater for more disadvantaged students (M. Sanders et al., 2018). These findings are in line with those of Peter, Spiess, and Zambre (2018) and Oreopoulos and Dunn, (2013). The former conducted a similar randomized controlled trial in Germany, and found that an in-class presentation on the benefits and costs of higher education, as well as on possible funding, one year prior to high school graduation increased application and enrolment rates, especially for students from non-college backgrounds with enrolment intentions prior to treatment (Peter et al., 2018). The latter tested whether a short promotional video about higher education accompanied by a financial-aid online calculator affect students' interests in and expectations about university in Canada. Students who had been exposed to this additional information showed higher aspirations about going to university and lower concerns about costs of attending it (Oreopoulos & Dunn, 2013).

The quality of the information provided also matters. An interim evaluation of Causeway Education's Access Champions programme showed that improving the quality of IAG in schools improves the quality of applications to higher tariff group courses (Causeway Education, 2019a). By providing schools teachers with training and support to improve the system they use to guide their students in the transition to post-18 destinations, Access Champions schools saw a statistically significant increase in offers from higher tariff group institutions.

Interventions that provide students with tailored information also appear to be more effective. In the US, Hoxby and Turner (2013) sent high-achieving low-income students semi-customised college information, and found that treated students were more likely to enrol in institutions matching their ability. The outcomes of interventions providing personalised information on the steps that need to be taken to enrol are somewhat smaller but still lead to improvement in enrolment rates with minimal intervention costs. Sending text messages to remind US high school graduates of the tasks required for enrolment during the summer had a small impact on two-year institution enrolment but not on overall access to higher education (Castleman & Page, 2015).

On the other hand, other studies show that simply providing information is not enough, and that light-touch interventions, such as those based on booklets or websites, have limited effect. Phillips and Reber (2018) evaluated a 15-month US program designed to provide low-income students with the information and support that higher-income students typically receive. While the intervention improved some intermediate outcomes (such as registering for and taking the SATs), these improvements were modest, and did not translate to higher college enrolment. Similarly, in a US-based randomised control trial, Carrell & Sacerdote (2017) found that providing students with information on the financial and non-financial benefits of attending college had no impact on college attendance and persistence.

In England, two studies found that light-touch interventions were not effective to raise aspirations and college-going intentions. Silva, Sanders, and Chonaire (2016) ran a randomised control trial in Somerset and found that giving students information cards on the costs and benefits of higher education had a negative and statistically significant effect on their stated likelihood of attending university. In a similar fashion, McGuigan, McNally, and Wyness (2019) devised an experiment in

secondary schools in London where treated students were given access to a password-protected website containing important information about wage premia and employment prospects as well as information about university tuition fees, maintenance grants, and loans. The authors found that students exposed to the information campaign showed increased intention to pursue post compulsory education. However, the authors also found that the students more likely to access the website were those more likely to proceed to higher education to begin with (those with higher ability or from higher socioeconomic groups), while that those less likely to access the information (those from lower socioeconomic groups) had more to benefit from doing so. These results therefore suggest that students who voluntarily access information may not be the group that could potentially gain the most from it, and that simply providing information on the costs and benefits of education may not be effective for students who believe that it is too difficult or costly for them to internalise the information and act on it (McGuigan et al., 2019).

Conclusions

The light-touch interventions analysed in this section were low-cost, fully scalable randomised control trials that had limited effects on both aspirations and actual enrolment. One possible mechanism to explain these findings could be that these low-intensity and light-touch interventions are able to impact only students at the margin of applying to university, while the process of getting non-applying students to apply is more demanding. Another hypothesis could be that students' beliefs about higher education do not automatically impact their behaviours to apply (Herbaut & Geven, 2019, p. 15). The evidence analysed showed that simply providing information may not be enough, and that students need personalised support to help them to make decisions about their education. The literature identifies that underrepresented students tend to turn to informal sources of IAG, have less access to formal IAG and prefer first-hand information (J. Moore et al., 2013). The most successful IAG interventions for underrepresented groups appear to be those that are tailored to the students, start early and are integrated into other forms of support, such as career advice and guidance.

Summer schools

Figure 21: Summer schools: impact by evidence type[8]
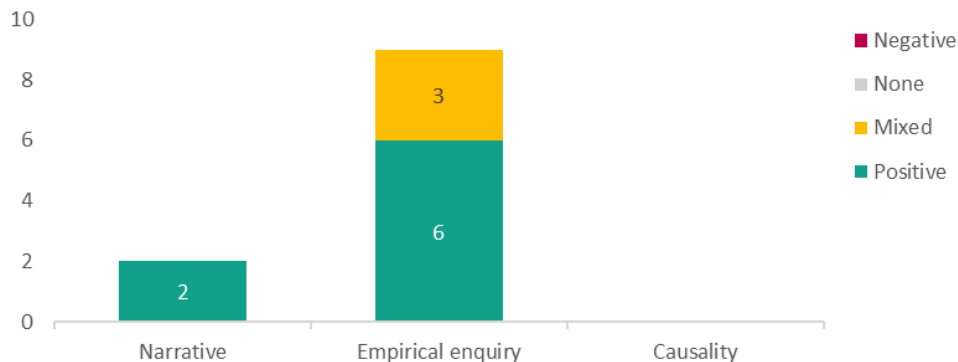
Summer schools are a popular and widespread outreach activity for widening participation in UK higher education. The aim of these programmes is to equip students with the knowledge and insight to make high quality applications to prestigious universities and to debunk the myth of higher education as an elite environment. Summer school are usually targeted at young people from underrepresented groups, who are given the chance to meet academic staff and students, attend university-style lectures, take part in workshops and projects, and experience university life. However, despite their widespread use, research on summer schools' effectiveness has been rather limited. None of the studies analysed provided a causal evaluation of the impact of summer schools on students' progression to higher education.

Most summer schools have been developed with the objective of giving disadvantaged young people who are less familiar with higher education a taste of what going to university would be like. The underlying rationale is that through the provision of sustained and intensive residential activities at a university, these students develop a stronger sense of belonging and are encouraged to progress to higher education. Using a mix of quantitative and qualitative methods, Hatt, Baxter, and Tate (2009) analysed the impact of Aimhigher summer schools in the South West of England and found that participating in a summer school had a positive impact on young people's attainment and confidence. Their findings suggest that the summer schools were successful in replicating the university experience, enabling participating students to feel socially and academically comfortable within the higher education environment, but that they were mostly serving with higher education aspirations already. Aimhigher-funded summer schools have been evaluated also by HEFCE (2010), finding similar results. Summer school participation was associated with increased attainment and progression, especially for disadvantaged students, who were over twice as likely to be accepted to higher education than similarly disadvantaged people who did not participate.

Summer schools appear to be successful in raising aspirations and developing a better understanding of the higher education world. Bourdeau, Galloway, Arnold, and Nott (2014) evaluated a science camp in the US and found that all of the students who participated reported stronger intentions to attend college after completing high school, and took the college entrance exams at a higher rate than the overall student population. Similarly, a science summer school in the

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[8] Literature reviews and weak evidence are excluded from this chart.

UK has been shown to significantly improve students' motivation and confidence about STEM related careers and education (Lawson et al., 2019). Evaluations of summer residentials in the East Midlands found that secondary school participants had significantly improved their knowledge on how to apply to university, of the difference between course options and of the best university for their subject of interest (Hayes et al., 2018; Church, 2018b, 2018c). Similarly, following a two-night residentials, secondary-school students reported increased aspiration to go to university and a better understanding of the steps that need to be taken to achieve this goal (Aspire to HE: Higher education for all, 2018). On the other hand, a study of a summer school targeting Year 9-11 pupils found that while knowledge of higher education increased among participants, students from low-participation neighbourhoods were generally less likely than other students to experience an increase in confidence about going to university (*Outreach Summer Schools 2018: Feedback summary*, 2018).

Many students feel under-prepared for higher education, and this may contribute to a feeling of alienation when they arrive on campus; this may be especially true for mature learners, many of whom are returning to education after a significant gap. Thomas (2013) showed that summer schools can help to boost confidence and foster a sense of belonging for this group of students. Analysing the Study Skills Summer School for mature learners, a two-day non-residential programme focusing on academic and transferable study skills in conjunction with social elements, the author found that it allowed students to get to know programme staff, increased their confidence and skills and created a strong cohort identity.

The transition from secondary to higher education can be challenging also for students with a disability, for whom many of the academic, social, and daily living challenges may seem magnified. Studying the impact of a summer school target at autistic, Lei, Calley, Brosnan, Ashwin, and Russell (2018) found that their worries and concerns about transitioning to higher education were significantly reduced after the programme, and that students were more optimistic about starting university. However, the authors do not look at medium- and long-term effect of the interventions, such as application or enrolment rates.

The literature suggests that summer schools can also play an important role in progression to more selective institutions. Hoare and Mann (2011) studied the Sutton Trust Summer School Program, a large cross-university national-scale outreach programme which operates in four prestigious universities. Using different sets of control groups (but no pre/post data), the authors found that the summer schools' students were more likely to apply for and register in higher education institutions, particularly the summer school host universities. An evaluation of a summer school run by the University of Nottingham showed that the program was successful in giving participants a high-quality academic experience, informing their future choices and increasing the likelihood of their applying to the host university, although the effects were small and often not statistically significant (Younger, 2017).

Conclusions

The evidence analysed in this section shows that summer schools or residentials are positively correlated with an increase in confidence and aspirations, but effects on application to and acceptance by higher education institutions are mixed. However, none of their studies we analysed moved beyond correlations to estimate the causal effect of attending a summer school on

aspirations or participation outcomes. While the positive relationship between summer school participation and higher education progression is encouraging, the evidence analysed did not consider unmeasured factors associated with going to a summer school that are also associated with greater higher education progression rates. That is, it is possible that students participating in summer schools would have had higher progression rates compared to non-participants, even in absence of the summer school. Since summer schools are high-cost interventions, rigorous experimental or quasi-experimental research is needed to properly evaluate their effectiveness.

Black box interventions

Figure 22: Black box interventions: impact by evidence type[9]
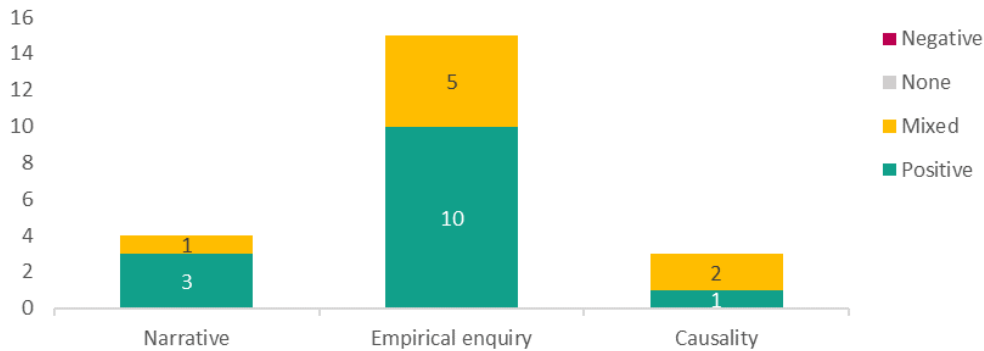
Several studies have shown that, compared to their more advantaged peers, disadvantaged students lack the social capital that would help them to successfully make the transition into higher education (see Le et al., 2016 for a review).[10] To increase the likelihood that students will have the necessary social and academic capital to enrol in universities, many widening participation programs take a multi-faceted approach to provide students with the support they need to encourage access to higher education. These programmes could be described as 'black box' interventions, in that they combine multiple components, including: mentoring, counselling, and role models; information, advice and guidance (IAG); summer schools, campus visits and subject tasters; workshops; and financial aid. These programmes are usually large-scale, high-cost interventions, spanning extended periods of time and therefore supporting students at different life-cycle stages.

Black box interventions are of interest in the UK context, as they are among the most widespread approaches to encourage higher education participation for underrepresented groups. A clear example is Aimhigher, an umbrella programme delivering a wide range of initiatives aimed at widening participation in higher education among disadvantaged students. Aimhigher was created in 2004 through the integration of two earlier initiatives (Partnerships for Progression and Excellence Challenge) bringing together a wide range of partners, including universities, colleges, schools and training providers.

The activities organised by Aimhigher were divided into low-intensity activities, such as careers fairs and university evenings, and high-intensity activities, such as campus tours and subject-taster days. While the programme was discontinued nationally in 2011 to give higher education institutions increased responsibility for widening participation in conjunction with the new fee system, local partnerships remained operative and the extensive literature on the topic can still be useful to understand what works when delivering black box interventions.

Most of the literature analysed found a positive impact of Aimhigher on GCSE attainment and learners' attitudes and aspirations towards higher education (Hatt et al., 2007; Chilosi et al., 2010). However, none of these studies moved beyond correlations to get a causal estimation of these

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[9] Literature reviews and weak evidence are excluded from this chart.

[10] In this context we take social capital to mean students ability to leverage their network of relationships with parents, teachers, peers to provide them with the resources necessary so that they can make informed decisions related to applying to and enrolling in higher education.

outcomes, yet alone of improved enrolment rates. The lack of causal, rigorous analyses of the impact of Aimhigher interventions on actual higher education entry can partly be attributed to legal issues of data protection and ethical concerns about comprehensive targeting that may have restricted the scope for tracking studies (Chilosi et al., 2010, p. 3).

Newer programmes have been designed to include a rigorous evaluation component. An example is given by Aimhigher Plus, a new initiative targeting low-progression areas in the West Midlands and providing young people with a wide range of aspiration and attainment raising activities, including tutoring and mentoring, IAG, campus visits, masterclasses and summer schools. While a causal evaluation of the program is currently underway, preliminary findings based on a quasi-experimental approach using UCAS data suggest that students that engage in the programme are much more likely to be accepted into higher education than those that do not engage (Horton & Hilton, 2019).

Several studies evaluated Aimhigher: Excellence Challenge, a programme of interventions aimed to encourage young people to participate in higher education by providing them with additional support and information (Emmerson et al., 2005, 2006; Morris et al., 2005, 2009). The programme included a series of outreach activities such as campus visits or visits by university delegates to schools and colleges, summer schools for prospective students at various universities, improved information and marketing. It also included opportunity bursaries, that is, small amounts of money to help cover university expenses.

A statistical evaluation of the impact of Aimhigher: Excellence Challenge on young people's aspirations and attitudes towards higher education has been carried out by Morris and Rutt (2005). Using individual longitudinal data of Aimhigher participants and control groups, the authors found that participation in Aimhigher: Excellence Challenge activities was associated with positive attitudes to higher education and a greater likelihood of expressing the intention to go to university. Comparing the relative probability of actual progression to higher education for the first cohort of young people who were in Aimhigher schools and those who were in non-Aimhigher comparison schools, Morris and et. (2009) found that young people from Aimhigher: Excellence Challenge schools with low to average levels of attainment were more likely than their academic and socio-economic peers to progress to higher education. Emmerson et al. (2005) found evidence that being part of the Aimhigher: Excellence Challenge led to an improvement in GCSE attainment and in the proportion of pupils intending to take part in higher education. On the other hand, Emmerson et al. (2006) used a difference in difference approach between local authorities and found that the policy did not have positive and significant effects on further/higher education participation rates.

The use of financial aid coupled with widening participation outreach activities is common also in the US. Several US programmes combine the provision of scholarships with other outreach elements with the aim to build social capital and assist students throughout the enrolment process, while also removing the financial pressures faced by disadvantaged students.

Using a mixed-method approach, Pluhta and Penny (2013) found that the promise of scholarship covering all university costs combined with an intensive outreach effort resulted in a four-fold increase in the proportion of graduates who subsequently matriculated at the sponsoring community college. A more rigorous evaluation of a similar US intervention offering a mix of scholarships, tutoring, test preparation, career and college advice, campus visits and financial aid counselling found positive (but smaller) effects on enrolment (Bowman et al., 2018). Similar small

and positive effects on enrolment were also found in the evaluation of a US programme combining individual support in the form of mentoring, and the eligibility of lower-income participants for a scholarship (Pharris-Ciurej et al., 2012). On the other hand, using a regression discontinuity design coupled with a difference in difference analysis, Page, Kehoe, Castleman, and Sahadewo (2017) found that a US college success initiative targeting motivated low-income students and providing them with financial aid and ongoing support and assistance had little to no impact on college enrolment. Similarly, a randomised control trial on a comparable program offering a scholarship plus a wide range of outreach activities showed that while participating students were more likely to enrol at the sponsoring university than students in the control group, the impact of the programme on university enrolment overall was not statistically significant (Bergin et al., 2007).

UK interventions offering a mix of information, advice and guidance, counselling, mentoring, summer schools and other outreach activities found a positive impact on aspirations, awareness and confidence. The University of Sheffield and Sheffield Hallam University run several of these programmes, including Heads Up (Simms, 2015), HeppSY+ (Miller, 2019) and SOAMS (Thompson et al., 2017). Heads Up is a longitudinal programme that aims to increase disadvantaged young people's knowledge of higher education and their aspiration to progress.

Using pre- and post-intervention questionnaires, Simms (2015) found that Heads Up students exhibited higher self-reported understanding of university and confidence in their ability to 'fit in'. While students participating in HeppSY+ activities also reported higher confidence and aspirations, they were still concerned about the potential barriers they might face in accessing higher education (Miller, 2019). SOAMS, a programme similar to the ones above but specifically designed to broaden access to medical education for able students who may not otherwise enter the profession, was evaluated by Thompson et al. (2017). Participating students reported increased motivation which led to a change in their aspirations regarding studying medicine; among the factors that contributed to this change were developing an increased awareness, knowledge and understanding of university life and a clearer idea of what being a medical student involves. In Scotland, two studies found similar results. An evaluation of Lift Off – a widening participation program in Scotland combining campus events, residential summer schools, as well as one-to-one applications support and guidance – found that 39 percent of participating pupils progressed to higher education compared with an average of 17 per cent (Universities Scotland, 2014). Evaluating the Schools for Higher Education Programme (SHEP), a Scottish intervention with similar components, Sosu, Smith, McKendry, Santoro, & Ellis (2016) found that while pupils' and teachers' feedback suggested the potential role of SHEP in promoting access to higher education, these findings were not conclusive due to the absence of good quality quantitative data.

Black box interventions have also been proved successful in increasing the proportion of disadvantaged students enrolling in more selective and prestigious universities. An example is Realising Opportunities (RO), a programme aimed to promote progression for students from underrepresented groups to research-intensive universities in England, offering a wide range of activities such as residential experiences, subject taster events, a national student conference, online study skills modules and mentoring.

Evaluations of multiple RO cohorts showed that students' self-reported confidence, awareness and preparedness for higher education in general, and research-intensive universities in particular, were considerably higher at follow-up when compared to the baseline survey (Lamont et al., 2014; Aston

& Kettlewell, 2014a, 2014b). A more recent evaluation found that RO students were also significantly more likely to enter higher education, and attend a research-intensive university, than a similar comparator group that had participated in different outreach activities (Williams & Mellors-Bourne, 2019). On the same line, students exposed to one-to-one tuition, mentoring, workshops and trips to universities were significantly more likely to apply to and enrol in the top third most selective UK universities, compared to a control group with similar demographics, school characteristics and attainment (The Access Project, 2018).

In the US, Millet & Kevelson (2018) evaluated the Princeton University Preparation Program (PUPP), an intensive 3-year, year-round programme including summer residentials, college visits, mentoring, weekly academic enrichment sessions and personalized guidance on college admissions and financial aid applications. By comparing PUPP pupils with similarly high-achieving students who were not accepted to PUPP, the authors showed that the programme is successful in increasing enrolment and helping students to attend more selective colleges than they might otherwise have attended.

Several studies have shown that programmes providing underrepresented students with academic enrichment, social supports, life skills, and financial knowledge can help them to succeed in higher education and overcome their disadvantages. Evaluating College Bound, a US college readiness programme offering tutoring, workshops, test preparation, counselling and personalised financial aid advising, Le et al. (2016) found that participation was positively correlated with increased attainment and college enrolment.

White, Eames, and Sharp (2007) evaluated IntoUniversity, an English programme delivering academic support, mentoring and skills development workshops to young people at risk of failing to meet their potential due to economic, social, cultural or linguistic disadvantage. Using a mix of case studies, observations, interviews, and evaluation surveys, the authors found evidence of increased motivation, self-esteem and confidence, as well as of improved academic, social and practical skills, amongst participants.

Black box interventions appear to be also used to target specific underrepresented groups. An example is white working class boys, who are among the lowest performing groups at the end of secondary education and for whom the fear that a university degree is a poor form of investment is a greater barrier than the upfront cost of studying (Baars et al., 2016). Research shows that providing this group with visits to universities and graduation ceremonies, sessions with role models and graduate interns, and one-to-one career advice had a demonstrable impact on the boys' confidence to apply to university and on their sense of fit in the higher education environment (Clague et al., 2019). The use of male undergraduate students as role models, as well as less traditional approaches such as involving white disadvantaged boys in outdoor inspirational activities or creating synergies and connections between football and higher education, were also found effective in changing this group's perceptions and attitudes towards university (Action on Access, 2006; Universities Scotland, 2014; Astley, 2017; Clague et al., 2019).

Another vulnerable group that is usually overlooked by the literature are looked after students, who tend to have poor educational outcomes and show very low rates of progression to higher education (Geiger & Beltran, 2017). [11] The literature analysed shows that while looked after young people have high aspirations for higher education, there are several barriers that prevent them to access these

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[1111] Generally children who have been in the care of their local authority.

opportunities, including low expectations amongst carers and other professionals in their lives (Mazzoli Smith & Laing, 2015; Geiger & Beltran, 2017). Programmes aimed to improve looked after young people's confidence, awareness and aspirations, as well as to address concerns and misconceptions of carers could be effecting in removing some of these barriers and helping care leavers progress to higher education (Mazzoli Smith & Laing, 2015).

Conclusions

While the black box approach is by far the most common among widening participation initiatives, drawing conclusions on its effectiveness is challenging. Firstly, the black box interventions analysed were all complex and made up of several components; it was therefore not possible to infer from these studies which elements of the programmes may have been instrumental in causing any identified effects. Secondly, most of the literature was based on case studies, interviews or secondary analyses of data; the impact of these programmes was evaluated mostly by showing whether and to what extent students perceived that the activities had been beneficial and how they had changed their aspirations and attitudes towards higher education. Since these programmes tend to be large-scale, high-cost interventions, there is a need for more rigorous, causal evaluations that look not only at changes in aspirations and awareness, but also at actual enrolment. Moreover, future programmes should be designed to understand the separate impact of each single component.

Other interventions

Figure 23: Other interventions: impact by evidence type
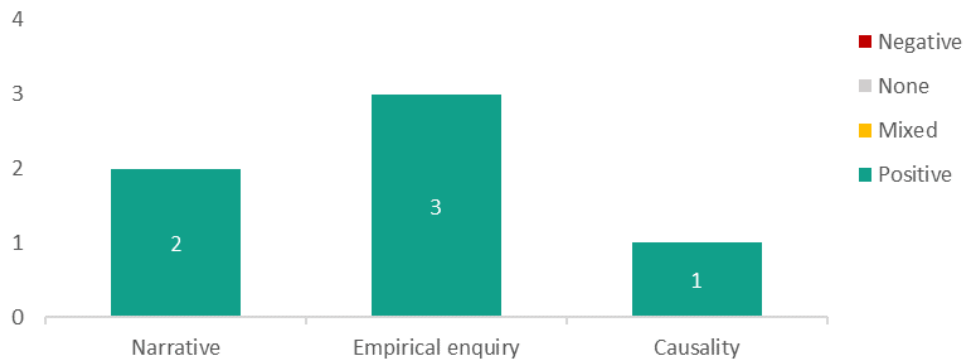
Note: Literature reviews and weak evidence are excluded from this chart.

There are variety of other interventions, such as campus visits and subject tasters, foundation courses, library outreach programmes, and conferences and workshops, which are rarely covered in the literature on widening participation. Here we cover some of the more relevant studies.

There is a growing body of evidence that shows that early intervention are crucial to widening higher education participation, as by Key Stage 4 higher-achieving pupils from the most disadvantaged backgrounds fall well behind lower-achieving pupils from the least disadvantaged families (Crawford et al., 2017). Despite an apparently strong case for interventions taking place during the earlier educational years (see Cheung, 2017 for a brief review of the evidence), many outreach interventions target post-16 students. Exceptions to this pattern are the Scholars Programme (*The Brilliant Club: Annual Impact Report, 2017/18*, 2018) and the Discovery Days programme (University of Nottingham, 2017). The Scholars Programme targets pupils from primary school to Year 12 and employs PhD or post-doctoral researchers to deliver university-style tutorials on their subject of expertise. Results show that when compared to a control group, pupils who had completed The Scholars Programme were significantly more likely to apply to, receive an offer from, and progress to a highly selective university; compared to before the intervention, pupils also reported higher academic achievement, deeper learning skills and greater preparedness for university (*The Brilliant Club: Annual Impact Report, 2017/18*, 2018). Discovery Days is a campus visits programme developed by the University of Nottingham to allow pupils in primary schools to experience activities and facilities not available in schools. The programme was successful in increasing awareness and understanding of higher education, engaging children in learning and raising their aspirations for the future (University of Nottingham, 2017).

Successful interventions appear to be those that not only raise academic aspirations, but also equip learners with the tools to fulfil those aspirations, by enabling them to develop transferrable skills which support their learning and boost confidence. An example is given by Lewis (2017), who analysed a cross-curricular scheme in which 13-15-year-old learners work in small, mixed-school teams to complete a two-day research experience, before spending a third 'taster day' in university. By taking part in, and making a valuable contribution to, university research, the author showed that learners developed the knowledge, skills and confidence that are essential to succeed in education and work. On a similar note, taster weeks offered by the University of Glasgow and targeting first-

generation students were found to have a positive impact, with around one third of participants progressing to study at the University itself (Universities Scotland, 2014).

Research has also emphasised the importance of widening participation activities that go beyond what pupils would normally do in the classroom. A report from Nottingham Trent University (2019) evaluated a series of interactive, confidence-building workshops each addressing a particular aspect of the GCSE curriculum that students from disadvantaged learners found challenging, and found a strong correlation between participation and improved attainment. Achieving top grades, especially at A levels, is key to access top universities. Recognising that students struggle to do so particularly in biology and chemistry, King's College developed K+ Raising Attainment Project, a two-year series of intensive revision sessions for young people studying these subjects to ensure they meet the terms of their university offer. Preliminary findings highlighted an overall average 8% improvement in attainment over the course of the project, the equivalent of one grade at A-Level (King's College London, 2017).

An interesting and often overlooked barrier to progression for disadvantaged students is their potential lack of information literacy: they often have little experience of how to use a library, search effectively for information and use appropriate scholarly sources. There is evidence that library outreach programs can avoid students feeling overwhelmed by the level of informational literacy expected from them at university and to improve both their ability and confidence (Anderson & Bull, 2014; Reading, 2016). In England, Anderson and Bull (2014) evaluated a two-hour Library Services masterclass aimed at developing the skills that students often lacked at the point of transition from further to higher education, and found that the program received considerable positive feedback. Analysing a similar intervention targeted at disadvantaged students in Australia, Reading (2016) found that students who received a library outreach program expressed increased confidence with their information skills.

While many outreach projects covered in this literature were successful at increasing university participation amongst participating students, they often overlooked one of the most vulnerable and excluded group of learners: those without conventional educational qualifications. An exception is given by McLellan, Pettigrew, and Sperlinger (2016), who analysed a foundation year programme at the University of Bristol aimed at preparing students without traditional qualifications for first-year undergraduate study. During the programme, students learnt the various study skills they needed to engage not only with the academic content in the Foundation Year, but also with the degree programmes onto which they could progress. The authors showed not only that the program was successful at attracting learners that would not otherwise be in education, but that success at an elite university is possible for those with non-traditional educational backgrounds. Similarly, case studies evaluations summarised by Office for Fair Access (2017) found that access modules (such as STEM access courses, or Certificates in Higher Education) were successful in supporting the progression of mature students without traditional qualification to undergraduate study.

Finally, there is evidence that class size might be important for widening participation. Exploiting the random variation in class size in the early grades of elementary school created by the Tennessee Student/Teacher Achievement Ratio experiment (Project STAR), Dynarski, Hyman, and Whitmore Schanzenbach (2013) found that being in a small class increases students' probability of attending college by 2.7 percentage points. Enrolment effects are largest among black students, students from low-income families, and students from high-poverty schools, which indicates that class-size

reductions during early childhood can help to close income and racial gaps in postsecondary attainment (Dynarski et al., 2013).

<u>Conclusions</u>

Other interventions found in the literature include: campus visits; subject tasters; foundation courses; library outreach programmes; conferences and workshops. All these interventions were found to be positively associated with increased levels of confidence and aspirations, but whether the relationship is a causal one is unknown. Most of the evidence covered in this section is purely correlational: further research aimed at identifying any causal effect in these areas is therefore needed.

5 - Discussion and recommendations

This literature review provides an overview of the impact of the most common interventions implemented to improve higher education outcomes of disadvantaged students. The review looked at a large body of material, which varied substantially in terms of target groups, intended outcomes, methodology and quality, highlighting the breadth of outreach activities going on in the sector.

Overall, the available evidence from widening participation literature is encouraging. The large number of interventions and programmes reflects the collective effort and commitment of the sector to reduce inequalities in higher education. While there are still some gaps in the research base, and the evidence often does not demonstrate causality, there has been an increased focus on robust evaluations. Most of the studies analysed found positive, but often modest, effects. One possible explanation for this relates to the fact that the many interventions were targeted at post-16 students: given that socio-economic difference in participation rates shrink when controlling for achievement at the end of secondary school, policy interventions aimed at encouraging disadvantaged pupils aged 16 or over to apply to university are unlikely to have a major impact.

This review identified the following key findings:

- Most widening participation initiatives analysed were black box interventions combining several outreach components. Since they support students through different mechanisms, these interventions seem to lead to considerable improvements in higher education outcomes but drawing definitive conclusions on their effectiveness is challenging. First, due to the programmes' multi-faceted nature, these studies could only evaluate the *overall* effectiveness of an intervention, rather than the separate impact of the different components. This makes the findings of these studies hard to generalise, since the bundle of interventions that worked in one context may not work elsewhere, and we may not know what drove the effect. Second, the impact of these programmes was evaluated mostly by showing whether, and to what extent, students perceived that the activities had been beneficial and how they had changed their aspirations and attitudes towards higher education.

- Programmes offering financial aid to disadvantaged students are expensive widening participation interventions, that have positive but small effects on enrolment. The literature shows that by lowering the price of higher education and alleviating financial pressures, financial aid can stimulate enrolment and allow for better matches with students' subject and institution preferences. Such literature also suggests that financial support is most successful when it is relatively easy to understand and apply for, and efforts are made to raise awareness amongst potential beneficiaries. However, while the studies analysed were rigorous, causal evaluations, the setting was often international, therefore casting doubts on the validity of the findings to the English and UK context.

- Mentoring, counselling and role models interventions had generally positive impacts on the outcomes considered. Qualitative and quantitative evidence suggests an increase in students' confidence to succeed in higher education, higher aspirations and a better understanding of the world of university, especially when the mentors can act as relatable role models for the mentees. However, causal evaluations of these interventions, especially in the UK, are very limited, and evidence on actual enrolment rates is scarce. While raising

aspirations for disadvantaged or underrepresented students is paramount to encourage them to progress to higher education, overlooking the actual application and enrolment rates resulting from mentoring interventions could lead to overestimating their effectiveness.

- Outreach interventions offering information, advice and guidance to underrepresented students in during secondary school are a low-cost tool to address inequalities in access to higher education. The literature shows that students need personalised support to help them to make decisions about their education, and that successful interventions are those that are tailored to the students, start early and are integrated into other forms of support, such as career advice and guidance. On the other hand, light-touch interventions which only provide additional information do not seem to efficiently raise the higher education outcomes of disadvantaged students.

- Summer schools are high-cost interventions that appear to be positively correlated with an increase in confidence and aspirations. However, evidence on their effects on application to and acceptance by, higher education institutions shows mixed results. Furthermore, none of their studies we analysed moved beyond correlations to estimate the causal effect of attending a summer school on aspirations or actual enrolments.

Evidence gaps

We identify the following areas where additional evidence is needed:

- Overall, there is still a lack of available evidence on the impact of the outreach interventions on enrolment rates. To avoid overestimating the programmes' effectiveness, it is crucial to provide causal evidence on the capacity of interventions to translate increased aspirations and awareness into a higher enrolment rate.

- Much of the evidence is concentrated on students in their final years of secondary school and post-16 learners (A levels students in particular). Given that differences in attainment can explain much of the participation gap, and that these arise early, there is a lack of evidence on the impact of interventions happening earlier in the student life cycle.

- Most of the literature targeted socio-economically disadvantaged learners and first-generation students, while some vulnerable and underrepresented groups were systematically overlooked. These include, among others, mature students and vocational learners. Moreover, very few studies analysed gender differences in participation rates and evaluated programmes aimed to level them.

- There is very little evidence on the causal impact of black box interventions on higher education outcomes. These tend to be very high-cost interventions, and an appropriate research design is needed to properly understand their value for money.

- There is very little evidence on the causal impact of financial aid in the English and UK context, with most evidence derived from the United States.

- The literature does not contain any attempt to estimate the causal effect of attending a summer school on aspirations or participation outcomes. While the positive relationship between summer school participation and higher education progression is encouraging, it is possible that students participating to summer schools would have had higher progression rates compared to non-participants, even in absence of the summer school. This evidence gap is stark considering the high cost of these interventions.

Recommendations and future research

Based on the evidence gaps identified above, we identify the following priorities:

- To avoid overestimating the effectiveness of widening participation interventions, it is crucial to provide more causal evidence on the capacity of interventions to translate increased aspirations and awareness into a higher enrolment rate.
- There is a need for more robust research on the impact of black box interventions, with a focus on teasing out the separate effect of each component. Robust monitoring and evaluation should be built into these interventions from the start.
- There is not enough research focused on vulnerable but overlooked groups, such as mature students, carers and care leavers, some ethnic minority students and vocational students.
- More causal evidence on the effectiveness of summer schools should also be carried out. Where randomised control trials are not practical, other quasi-experimental techniques should be applied.
- More research on financial aid is recommended to ensure relevance to the English and UK context.
- The government and its delivery bodies must facilitate greater tracking of the progression outcomes of participants in widening participation interventions over time and between the school, college and the higher education sectors. This would provide greater evidence based on actual enrolments to higher education rather than on self-reported aspirations and attitudes only, and would allow for the development of more research on interventions happening earlier in the student life cycle.

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Appendices

A1. Inclusion/exclusion criteria and search terms

The inclusion/exclusion criteria were established prior to the search process and were developed to focus on the characteristics of interest in terms of population, interventions, outcomes, study design and time frame.

Figure A1.1: Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Population	Disadvantaged or under-represented groups including ethnic minority students, students from areas of low higher education participation, low household income and/or low socio-economic status, disabled students, mature students, vocational learners, carers and care leavers.	Interventions not targeted to disadvantaged or under-represented groups.
Interventions	Interventions explicitly targeted at increasing HE participation at the undergraduate level for disadvantaged or under-represented groups (including outreach interventions funded by HE providers aimed at raising student attainment to facilitate subsequent HE entry). Interventions conducted in the UK or conducted elsewhere but sufficiently relevant to the UK context to be replicated in the UK in some form.	Interventions where increased HE participation for disadvantaged or under-represented groups was not the specific outcome. Interventions implemented in other countries that could not be replicated in the UK.
Outcomes	One or more of the outcomes included in Figure 1.	Other intended outcomes.
Study design: type 1	Include studies that show: Coherent strategy Approach/activities backed by evidence from literature or other evaluations Shared understanding of processes Reason for activity Clear conception of why the changes sought to make are important Programme reviews	Exclude studies that show: Disjointed activities No rationale for developing approach and activities Model of change that is not shared Ad-hoc activities No understanding of needs of target groups No review or evaluation
Study design: type 2	Include studies that show: Clear aim of what it is sought to achieve Selected indicators of impact	Exclude studies that show: Aims developed after activity No concept of measuring success

Criteria	Inclusion	Exclusion
	Use of quantitative or qualitative data or both Pre/post data (minimum two points in time) Analysis competently undertaken Sharing of results and review of activity	Information that is not systematically collected No pre/post data Data not related to the intervention Results not used to inform decisions
Study design: type 3	Include studies that: Have a treatment and a control group Use an experimental or quasi-experimental design Consider selection bias and try to avoid it	Exclude studies that: Do not have a control group Use groups that are not comparable Have selection bias in control groups
Time frame	Emphasis on studies published since 2012 (when student finance reforms took place)	Older studies, unless particularly salient or relevant.

Search terms were decided based on the most common language used in the literature on widening participation. Subsequent rounds of searches were run to identify studies that used more rigorous methodologies, such as randomised controlled trials and quasi-experiments, or to identify evaluations of particular UK widening participation programs.

Figure A1.2: Search terms

Search	Group 1: HE	Group 2: outcome	Group 3: design	Group 4: programs
1 (title)	"higher education" OR HE OR college OR university OR degree	participation OR access OR admission OR enrolment OR enrollment OR aspirations OR progression OR awareness OR attainment OR engagement	evidence OR intervention OR evaluation OR impact OR effect OR role OR analysis OR review	
2 (title)	"higher education" OR HE OR college OR university OR degree	outreach		
3 (title)	"higher education" OR HE OR college OR university OR degree	widening participation OR access		
4 (title)	"higher education" OR HE OR college OR university OR degree	participation OR access OR admission OR enrolment OR enrollment OR aspirations OR progression OR awareness OR attainment OR engagement	random OR "controlled trial" OR experiment OR "quasi-experiment" OR causal OR matching	
5 (title)				Aimhigher
6a (title)				"Realising Opportunities" OR "Sutton Trust Summer Schools" OR "Widening Access, Student Retention and Success" OR "National Scholarship Programme" OR "Access Project" OR "Brilliant Club" OR "National Collaborative Outreach Programme" OR "Opportunity

Search	Group 1: HE	Group 2: outcome	Group 3: design	Group 4: programs
		58		areas" OR "Action on Access" OR "Brightside" OR "IntoUniversity" OR "Pupil premium"
6b (Google search)				"Access Agreement - Office for Fair Access" OR "Access and Participation Plan - Office for Students"