

Access, retention, attainment and progression: an integrative review of demonstrable impact on student outcomes

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Contents

Foreword	2
Executive summary	3
Introduction	5
Aims and objectives	7
Background	8
Methodology	11
Access	16
Retention	30
Attainment	43
Progression	60
Conclusions	69
Recommendations: guidelines for demonstrable impact	70
Appendix 1	72
Appendix 2	91

Foreword

I'm delighted to introduce this integrative literature review that presents a synthesis of literature in access, retention, attainment and progression from 2016 – 2021. The review sets out to demonstrate significant impact in each of these key areas for student success and follows an earlier Advance HE review by Webb Wyness and Cotton (2017) on literature from 2008 – 2016.

In an era of fees, global uncertainty surrounding job markets, the worldwide health pandemic alongside more local disruptors and drivers – eg for the UK, Brexit and increased aspirations to widen participation, it is essential that we understand what works to improve outcomes for different groups of students.

The review carefully considers the four typical and critical stages of the student life-cycle:

- + Access to HE 'the extent to which groups can gain entrance to different types of higher education institution'
- + Retention (participants' likelihood of continuing or withdrawing from study)
- + Attainment (the extent to which students are enabled to fulfil their potential; sometimes discussed in terms of achieving a 2.1 or first class degree)
- + Progression (successful transitions within the programme of study and afterwards to employment or further study) (HEA 2015).
(Webb et al, 2017, p 9)

Through these four 'windows' the authors present a range of evidence of demonstrable impact from interventions which seek to enhance each outcome, identifying core themes in each strand and providing several considered recommendations. By focusing on what works and adding to the evidence base the review provides the reader with an opportunity to consider and prioritise often limited resources for maximum impact.

We know that the issues impacting on student success are broad and complex, this review helps further the discussion by providing a shared point of reference to discuss, shape and review policy, process and practice. The review itself forms part of Advance HE Wider work on the review and updates to the Essential Frameworks for Enhancing Student Success and should be seen as a catalyst in progressing these debates.

It leaves me to thank the authors who provide a range of insights into these topical and significant areas. They provide a thorough overview, adding a considerable resource that will be of use across the sector, and ultimately influence the interrelated work being undertaken by Advance HE, through the review and update of the Essential Frameworks for Enhancing Student Success. The review ensures that you, our members, have access to current, relevant, and research informed best practice.

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Executive summary

- + This integrative literature review presents evidence of demonstrable impact from interventions which seek to enhance student access, retention, attainment and progression in higher education, published between 2016 and 2021.
- + This review updates a previous Advance HE review (Webb et al, 2017) by expanding the type of literature reviewed and aligning inclusion with the Office for Students (OFS) 'standards of evidence'.
- + An Integrative Review Protocol was produced which outlined the search strategy, data extraction, quality assurance and reporting processes. To aid transparency and support researchers who may embark on future reviews, the completed Protocol is included in Appendix 1.
- + A Student Outcomes Stakeholder Group (listed in Appendix 2) was invited to scrutinise the parameters of the review, emerging findings and dissemination planning via a collaborative appraisal process. Their critical feedback grounded the review in principles of inclusion and transparency.
- + Inclusion and exclusion criteria were applied to 13,810 sources resulting in 161 pieces of literature being included in the evidence base, distributed across access (n=45), retention (n=25), attainment (n=67), and progression (n=24) areas.
- + The access area focused on evidence from 45 sources of literature; 27 from the US, 16 from the UK, the rest from Australia, Canada, and Europe.
- + Thematic areas include: financial support; admissions/application processes; bridging programmes; outreach activities; extra-curricular activities; and information, advice and guidance.
- + The retention area reviewed 25 sources of literature; 18 from the US, the rest from the UK, Ireland, Australia, Spain, Germany.
- + Thematic areas included: learner analytics; faculty interactions/validations; learning communities; curriculum and pedagogical design; and non-academic personal support.
- + The attainment area reviewed 70 pieces of literature; 53 from the US and five from the UK, with the rest from Spain, Australia, Poland, Norway, Germany, Canada/North America, and Iran. Two studies were reviews of evidence researched within various locations.
- + Thematic areas included: structural and procedural interventions; teaching, learning and assessment interventions; and learning support
- + The progression area focused on evidence of progression to employment or further study from 24 sources of literature; 12 from the US, six from UK (three from Scotland) and the rest from Korea, South Africa, Iran, Switzerland, Turkey and one review which used sources from various locations.
- + Thematic areas included: career-based interventions; placements and professional experiences; and progression within the curriculum.

1 The Office for Students is the regulatory body for higher education in England and Northern Ireland.

- + The findings suggest clear relationships between each area – access, retention, attainment and progression – in terms of intervention design and holistic impact on more than one outcome measure.
- + Pertinent examples of holistic interventions included: early interventions delivered pre-entry and during transition and induction; interventions which provide financial aid or assistance to students pre and post entry; interventions which were designed purposively to align with the student's curriculum; interventions which provided personal support and guidance for students; and the use of learner analytics to support identification of student need, intervention design and evaluation of subsequent impact.
- + These findings could be related to the concept of 'mattering', the idea that 'the university' cares – a sense of which became evident from several studies across all the areas reviewed.
- + Limitations of the review included: a lack of evidence on long-term student outcomes; outcome definitions which risked overlooking intermediary/mediating factors; a dominance of quantitative studies aligned with metric-driven student outcome definitions; a messiness in the evidence base despite clear inclusion/exclusion criteria; a skew in the volume and quality of sources found in each area; a lack of differential impact on different student groups.
- + Researching during the Covid-19 pandemic created challenges for the research team. The reporting and publication impact of Covid is unknown but is alluded to in this review. Where interventions have relevance for the post-pandemic context, this has been highlighted. There are no studies in this review that discussed demonstrable impact of interventions employed during the pandemic.
- + The report challenges sector stakeholders to fix the 'leaky pipeline' of impact evidence so that research and evaluation can explore short, medium and, particularly, long-term outcomes of interventions.
- + Recommendations for practitioners relate to a commitment to 'sticky' practices; sustaining innovations so that long-term impact on student outcomes can eventually be measured.
- + Recommendations for researchers/funders focus on the development of evaluative practices; longitudinal approaches, collaboration and thus replication of findings, and inclusion of intermediate outcomes (short, medium, long) to measure the stages of development in a theory of change.
- + Recommendations for institutions relate to the leadership and value prescribed to institutional projects; qualitative evidence requires more visibility, and work should be supported beyond quick wins to enable sustained ('sticky') practices and evidence of impact over time.
- + Recommendations for the higher education sector focus on the exploration of robust impact across the whole student lifecycle; evidence of progression outcomes requires further investment, and encouraging space for failures and lessons learnt, in addition to positive impact, should be created for those researching and evaluating learning and teaching interventions.

Introduction

This review arrives not too many years after its predecessor (Webb et al, 2017), and builds on its findings as well as several other recent and related reviews. So, what was the impetus behind this new work? The last five years have seen unprecedented change in the political landscape as it relates to international higher education, amplified by the events of the global pandemic. From a UK perspective, according to Husbands (2021), from the mid-80s onwards the higher education sector has been a relative good news story. However, things now look to be changing. The landscape of higher education provision is increasingly marketised and the political environment is more hostile. There are culture wars about ‘freedom of speech’ on university campus and the return of centralised control and reductions in funding seem almost inevitable. Alongside this, the ‘value for money’ debate rages, and has been intensified by the unavoidable move to the provision of online-only study for the majority of degree awards during repeated Covid-19 lockdowns in 2020 and 2021. The pressure on universities to produce highly skilled graduates has perhaps never been greater. This is not only due to pressure from students as increasingly media-savvy consumers, but also as graduate outcomes are emerging as a prominent measure influencing national and international league tables, funding, and ultimately the portfolio of available degree awards. The pandemic also caused a huge disruption to pedagogical practices (and working practices). While several of the adopted tools and techniques have been around for many years, there has been a paradigm shift in terms of widespread use and acceptance of ‘the digital’ and all that entails. This has occurred within an environment of continued structural disadvantage, with the medium to long-term implications for underrepresented and minoritised students still relatively unknown.

This review then comes at a vital time, a time of extraordinary change and of a paradigm shift in higher education; a time when organisations are planning for what looks like a very different future than it did just a few years ago; a time when more people are aware of the inequalities inherent within our institutions, and perhaps more willing to take real and lasting action to address disadvantage. The recommendations contained within this review are primed to impact on this period of intense reflection, review and strategic planning. They have the potential to influence a way of thinking about how we plan and ‘deliver’ higher education at every level of an organisation; why we should be focusing on community not content, and how we involve and engage our most important stakeholders – our students.

In the pursuit of the evidence to inform this decision-making, a lack of evidence, misaligned evidence, or too much evidence can lead to inaction. Contextual differences can also impede an understanding of ‘what’s working’. This sought-after evidence requires the application of proportionality and, as Parsons (2017) suggests, considerations of technical specificity and an awareness of the political environment to which it is applied. This report aims to provide insights into this evidence base by sourcing, extracting and synthesising evidence of demonstrable impact from interventions which seek to enhance student access, retention, attainment and progression in higher education. This integrative literature review expands the type of literature reviewed by Webb et al (2017) while subsequently aligning inclusion criteria with the Office for Students (OFS) ‘standards of evidence’.

A review protocol was developed which prescribed the search strategy, inclusion/exclusion criteria, piloting and scoping, searches and quality assurance, data extraction, weight of evidence and reporting. This review adopted the tested approach of Austen et al (2016) and implemented a voluntary stakeholder group consisting of sector experts who provided critique and quality assurance, and whose contributions were regarded as an additional data source. Ethical approval for this review was obtained in April 2021.

Following an intense period of phased cleaning and filtering of 13,809 sources, 161 pieces of literature were included in the review evidence base, distributed across access (n=45), retention (n=25), attainment (n=67), and progression (n=24) areas. This review presents the methodology, points of reflection and subsequent findings, before providing recommendations for practitioners, researchers, higher education institutions and the higher education sector. In contrast to previous reviews, this report will comment on the implications of the research process and findings for the Covid-19 context, including reflections on researching while working remotely during a pandemic.

The evidence which rests in each area – access, retention, attainment and progression – and associations between these areas is complex. Definitions, methods and measures of student outcomes are fluid and contested. For each outcome area, summary headlines, thematic findings and methodological reflections are presented.

Aims and objectives

Key research question:

- + what evidence-based policy or practice has had a demonstrable impact on student outcomes (access, retention, attainment and progression) since 2016?

Supplemented by:

- + what are the 'standards of evidence' used to make claims of impact?
- + with reference to the nuances of the Advance HE framework, which policies/practice have most demonstrable impact on student outcomes?

Objectives:

- + to undertake an integrative review (IR) which assesses a range of literature concerning the scope of **access, retention, attainment and progression** in higher education
- + to append sector-wide guidelines for developing demonstrable impact regarding policy and practice
- + to identify gaps in the evidence base and make recommendations for further work.

Background

The scope of access, retention, attainment and progression covers the whole student lifecycle. This holistic approach to exploring student outcomes was promoted by the previous Advance HE literature review (Webb et al, 2017). Webb et al (2017) synthesised literature from 2008 to 2016 relevant to these areas. While noting a skew to US sources in their evidence base, they distilled access evidence to discuss financial interventions, support programmes, and modification of the admissions and application process. Retention impact related to financial interventions, timely and targeted programmes, and curricular and pedagogical interventions. Attainment impact related to general structural and procedural changes, pedagogical interventions, and provision of study support packages. Finally, progression impact related to careers service provision, progression within the curriculum, progression into specific pathways, and placements and professional experiences.

The aim of this report is to update this evidence with complementary literature, acknowledging that, in some areas, the outcome context may have changed. Kandiko-Howson and Buckley (2020) note that exploration and measurement of student outcomes is now highly politicised and has shifted from process / programme evaluation to outcome evaluation linked to quantitative sector datasets. During the 2017 review, the Teaching Excellence Framework² (TEF) in the United Kingdom (UK) was embryonic, and the reputational pressure to perform in key student outcome areas had not yet intensified. However, a growing focus on 'what works' in higher education had been emerging for some time (Thomas, 2012b; Thomas et al, 2017) epitomised by the creation of a new higher education 'what works' centre, Transforming Access and Student Outcomes (TASO). This review is influenced by these factors and seeks to provide evidence of demonstrable impact from 2016-21 across the student lifecycle.

The previous 2017 review and this current review aim to be international in scope. However, all the authors/researchers work within English higher education institutions (HEIs) and apply a UK-centric lens to the standards of evidence used.

Definitions

This review used the definitions provided by the Webb et al (2017, 9) review which was based on previous work by the Higher Education Academy (2015):

Access to HE – the extent to which groups can gain entrance to different types of higher education institutions.

Retention – participants' likelihood of continuing or withdrawing from study.

2 The Teaching Excellence and Student Outcomes Framework is a voluntary comparison of the quality of teaching in universities in England, with providers in Scotland, Wales and Northern Ireland also able to participate.

Attainment – the extent to which students are enabled to fulfil their potential; sometimes discussed in terms of achieving a 2.1 or first-class degree.

Progression – successful transitions within the programme of study and afterwards (to employment or further study)

The evidence base

The English HE sector uses the Access and Participation Plan (APP) as one of the regulatory tools to monitor student outcomes across access, retention, attainment, and progression. The Office for Students uses the APP to oversee how higher education providers³ will improve equality of opportunity for underrepresented groups to access, succeed in and progress from higher education. Recently, the OFS has tightened its own guidance (through the commissioning of bespoke research) and increased its expectations of impact evidence. This includes setting evaluation outcomes for providers (and itself) which are:⁴

- + providers commit to and prioritise a culture of evidence to support their work to eliminate inequality in higher education
- + providers use evidence to understand local and national inequalities, and to design impactful programmes
- + providers evaluate to understand impact, share, and learn from evidence.

Since 2018/19, these outcomes have been operationalised within an evaluation framework supplemented by three Standards of Evidence:⁵

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.

Type 2: Empirical Enquiry – the impact evaluation collects data on impact and reports evidence that those receiving an intervention have better outcomes, though does not establish any direct causal effect.

Type 3: Causality – the impact evaluation methodology provides evidence of a causal effect of an intervention.

3 Used interchangeably with 'higher education institution'.

4 www.officeforstudents.org.uk/advice-and-guidance/promoting-equal-opportunities/evaluation/strategy-for-evidence-and-evaluation-in-access-and-participation/what-needs-to-change/

5 www.officeforstudents.org.uk/media/6971cf8f-985b-4c67-8ee2-4c99e53c4ea2/access-and-participation-standards-of-evidence.pdf

As this integrative literature review calls for evidence of ‘demonstrable impact’ on student outcomes, it is appropriate to align this review to accessible sector standards. Comprehensive guidance on the distinction between Type 1, 2 and 3 evidence has been produced as part of a collaborative project led by the Centre for Social Mobility (2019) and is included and developed in an Integrative Review Protocol (Appendix 1). These standards have been developed specifically for interventions and initiatives which seek to enhance access into higher education. Mirroring the process used in recent evidence reviews (Social Mobility Commission, 2020; Wilson and Dauncey, 2020), this analysis explores the use of Type 2 and 3 evidence across the student lifecycle.

Furthermore, this review focuses on evidence of demonstrable impact beyond peer review publications. Many approaches which impact on student outcomes are shared open access across institutions in the spirit of collaboration. Sector agents and communities of practice produce publications which are not likely to appear in traditional journals, yet they are widely used. Therefore, this review champions the importance of grey literature⁶ to produce an inclusive review. These standards of evidence will provide the parameters for inclusion, rather than the place or type of publication.

6 Unpublished literature or pieces published without peer review.

Methodology

The project team consisted of a range of researchers from Sheffield Hallam University, including institutional researchers/evaluators, senior academic leaders and two student researchers.

Implementing an integrative review

This research applies an integrative review (IR) methodology. This approach tests and builds theory through an iterative process of evidence review and wider sectoral engagement (see Austen et al, 2016; Coren and Fisher, 2006). An IR protocol was drafted, reviewed and finalised for this research. This protocol outlines the search strategy, the selection for inclusion and the method of analysis. To aid transparency and support researchers who may embark on future reviews, the complete IR protocol is included in Appendix 1.

A range of evidence is used, incorporating a breadth of sources to minimise selection bias; including narrow types of highly specific evidence to grey literature, in addition to peer review publications and other published material. This replicates the search strategy of the 2017 review, and then builds on gaps in this literature base. Specifically, this includes:

- + grey literature from sector bodies
- + publications via EBSCO Information Services: British Education Index; Education Resources Information Center (ERIC); and HW Wilson.

Key questions and objectives for this review have been scrutinised by sector stakeholders – identified for this purpose – known as the Student Outcomes Stakeholder Group (SOSG) (see Appendix 2). Their input is treated as an additional data source and gathered accordingly. This group was also invited to scrutinise the parameters of the IR Protocol, emerging findings and dissemination planning via an appraisal process which operated in both written and verbal form. Ethical approval was sought and granted by Sheffield Hallam University Ethics Committee at the end of April 2021 and consent and data storage was managed for all activities.

Exclusion and inclusion of sources

The inclusion and exclusion criteria were developed with reference to the previous review, the insights of the Student Outcomes Stakeholder Group, and the expertise of the research team. A detailed overview of the criteria with an accompanying rationale can be found in the IR Protocol in Appendix 1.

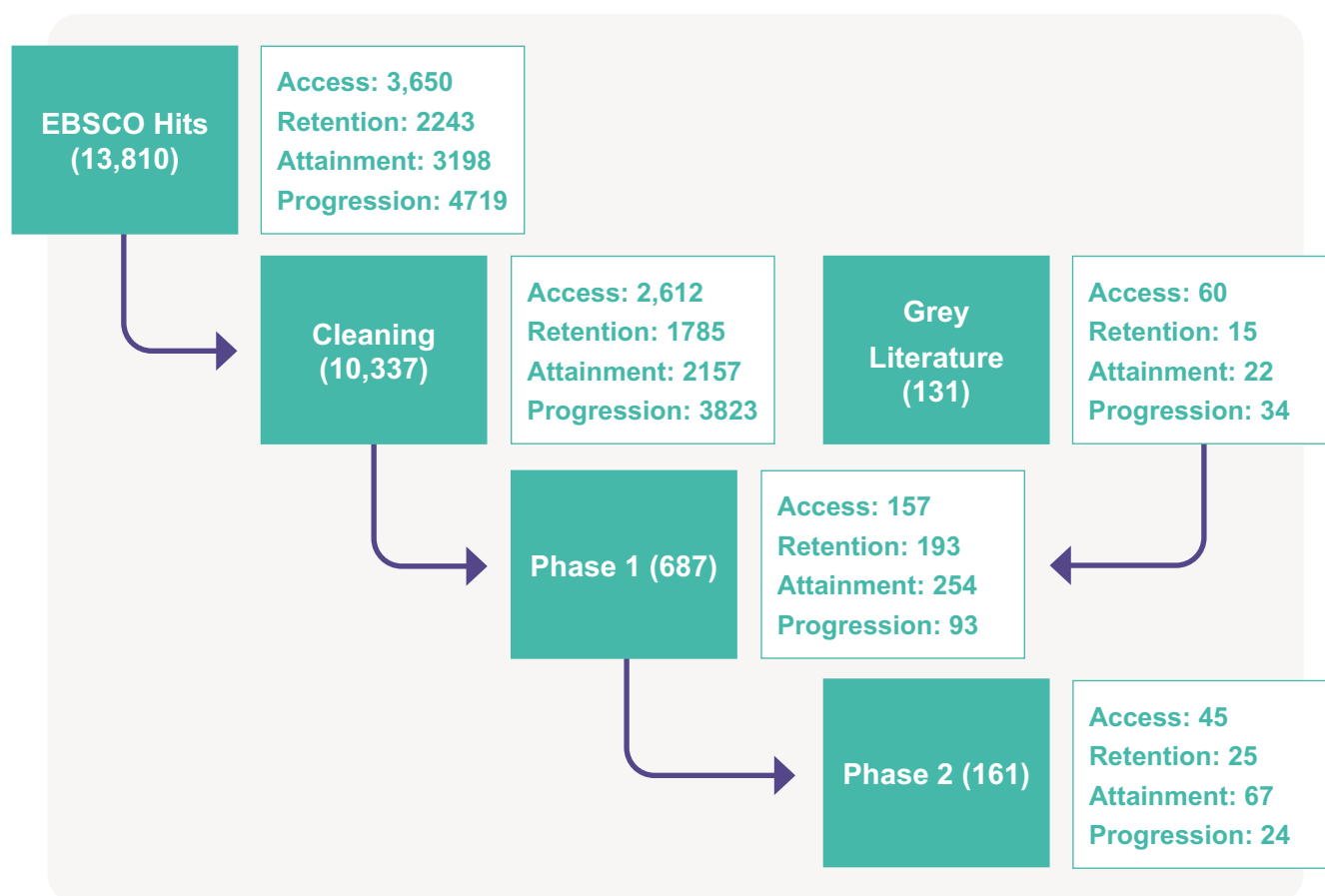
All sources found in the EBSCO database search were imported into four separate projects in RefWorks.⁷ A 'cleaning' phase was introduced which removed duplicates (not an exact match) and titles that were clearly out of scope. Anything relevant to higher education within the theme was retained. During this initial phase, work began on applying the search criteria to grey literature publications and importing these into distinct RefWorks folders. Phase 1 filtering reviewed abstracts

⁷ RefWorks is a web-based bibliography and reference manager.

using an abstract relevancy scoring matrix (0-8), specifically assessing topic focus and evidence type. Sources scoring 6 and above were retained. Sources scoring 5 were tagged for review on completion of this phase. Phase 2 data extraction reviewed the full article, excluding those that became less relevant during analysis and applied the location and publication access criteria. During synthesis, reviewers assessed methodological relevance, methodological quality and topic relevance to provide a judgment of overall weight of evidence.

During each filter stage, the lead reviewer implemented a quality assurance process of checking the retained and excluded literature and conducting a team exercise of blind scoring abstracts to check the consistency of criteria application. The research team met weekly to discuss progress and findings and add to quality assurance processes. This integrative literature review finally synthesised 168 pieces of literature.

Figure 1: Literature filtering – applying inclusion/exclusion criteria



Methodological reflections

During the development of the bid and the protocol, several anticipated limitations were outlined. These can be seen in the protocol document and are discussed further below.

Review limitations

While it is vital that the student lifecycle is considered holistically, the size and scope of this review was always challenging. This review aligned numerically with the 2017 review, with added sources from grey literature included. This inclusion enabled the review to reach current evidence written by diverse authors. Any reporting bias or skew interpreted during the review, including from the place of publication, has been acknowledged.

This review focused on demonstrable impact (Type 2 and Type 3 Standards of Evidence), published in a range of peer-reviewed publications and grey literature. An anticipated risk was that the required standards of evidence were not yet in the evidence base and the OFS shift to strengthen evaluation had not yet resonated with higher education providers and sector organisations due to time lags from project inception to publication. While this has not been realised, this review notes a lag in publishing institutional impact on pertinent regulatory issues (such as awarding gaps, graduate outcomes, grade inflation). The SOSG reflected on their own institutional experiences and the content of current Access and Participation Plans, providing examples of projects including community engagement, curriculum design, student co-creation, care-based environments, belonging, marking practices and coaching. As the provider requirements for evidencing longer term impact on student outcomes are 2020-25 (the duration of the existing APPs), there is an 'in progress' gap that has not been captured by this review. A 2025-26 review, aligned with current APP impact, is recommended.

Although the inclusion/exclusion criteria are well defined, the findings reveal a messiness to the data which means that sources do not fit neatly into prescribed categories. Despite internal quality assurance, ongoing reflective decision-making, and transparency in reporting, identifying evidence type, the parameters of an intervention/action and student outcome measures remained fluid and dependant on author, funder and reviewer interpretations. A similar review of the impact of data analytics from 2020 noted:

“Despite clear review criteria we found little consensus on the definitions of retention, academic performance and engagement ... as we critically unpacked the results of each study, we found that the lack of consistent definition for student outcomes both compounds, and is compounded by, disparate measurement methods, an overreliance on quantitative methodologies and underdeveloped theories of change underpinning the research. While academic performance, engagement and retention are not mutually exclusive outcomes, few studies articulated their objectives with recognition of the relationship. This is clearly an issue for evaluation in this field.” (Foster and Francis, 2020, 883)

The review anticipated, based on previous publications (Webb et al, 2017; Wilson and Dauncey, 2020) that there would be a bias and over-reliance on the access area, where practitioners in this space have the most well-developed evidence base as evaluation practices are well established, and a lack of sources pertaining to progression. There was more grey literature found in the access space, which we relate to regulatory funding and the focus of government policy. There were more extraneous sources found in the progression database search, but the lowest amount after inclusion criteria had been applied. The reviewers and the SOSG debated this conclusion and reflected on the lack of academic insight and possible unexplored resistance to researching progression outcomes from higher education academics. The reflection has been noted in the report's recommendations. Most of the included sources were found in the attainment section and reflect the plethora of studies which explore learning and teaching contexts. This skew is noted during analysis, as is the reporting bias of positive impact.

This review has focused on the long-term student outcomes of interventions, driven by the adopted definitions. This may have overlooked any mediating steps that could be affecting alternative, but equally important, outcomes. For example, strategies to enhance retention and attainment outcomes may first need to build a sense of belonging, or develop approaches to student engagement. By focusing on long-term impact, this review may have overlooked these intermediate steps. This has been discussed within each theme, and within an overview of literature which was on the boundaries of inclusion.

Finally, there is a skew in the definitions of student outcomes towards quantitative measures. As Foster and Francis (2020) forewarned, quantitative definitions of outcomes will lend themselves to quantitative methods in evaluation. While qualitative evidence is not excluded from this review, the definitions of access, retention, attainment and progression and the standards of evidence reinforce this skew.

Researching in times of covid

Researching remotely can be more challenging than in person collaboration, especially in a medium sized research team. Weekly meetings supported collaborative research and shared reflections, but digital barriers (such as broadband connection and RefWorks functionality) impeded the research at critical times. Lessons learned could inform future bid proposals and tender opportunities.

It was hypothesised that the HE sector may be experiencing evaluation fatigue and a publication lag due to Covid-19. The Phase One evidence base noted that approximately 20-25% of sources were published 2020/21. These sources were dominated by grey literature and justifies the inclusion in this and future reviews.

A further Covid-related limitation of this review is the applicability of pre-2020 strategies/initiatives/activities to the post-Covid future. During data extraction and synthesis, the reviewers acknowledged this context while generating findings. All findings have been presented, and post-Covid caveats have been included wherever necessary.

Insights from expert stakeholders

To sense check the findings, the review invited the SOSG to provide its reflections on impact in its members' local contexts. This provided an indication of the relevancy of the reviewed literature. Its suggestions and examples of current institutional work suggest that there may be a difference in the published literature and the work currently being conducted within institutions, which reflects particular contexts. This difference is related to the local and contextual exploration of intermediary outcomes. Recommendations for researchers and funders of future reviews will attend to this point.

The SOSG also fostered insightful debates about the context, scope, synthesis and reporting of this review, and foregrounded the lack of objectivity in review processes. These discussions have kept the review team grounded and ensured that process consideration did not dominate reflections.

These insights included:

- + the review should not exclude geographical contexts just because they differ from the English context. The Advance HE membership is international, and this should be accounted for. This review should not contribute to the exclusion of literature which is from the global south and impose a western colonial lens. This important consideration should be balanced with the production of applicable outputs
- + narrow definitions of student outcomes should be avoided, if possible. Measures of success beyond fixed definitions of access, retention, attainment and progression should be considered during data extraction and reporting
- + if applicable, any strong political stance of the included publications should be transparent in any reporting
- + during data extraction, reviewers should consider how the student is positioned in the publication, and during the discussed intervention / research process. Deficit approaches should be recognised and regarded as a limitation of the sources
- + there may be a need for researchers / evaluators / practitioners to reclaim the discussion of progression outcomes. The review should explore limitations in the progression evidence base in relation to politics/funding and levels of academic interest in this topic area
- + the review team should also reflect on what has not been found during the review, methodologically and conceptually

Access

Summary headlines

- + The access area focused on evidence from 45 sources of literature: 27 from the US, 16 from the UK, the rest from Australia, Canada, and Europe.
- + There is limited and variable evidence of the impact of financial support on increasing access of underrepresented groups in higher education, especially within the UK context.
- + Financial support packages that are accompanied by other interventions that address intersectionality and the multiple barriers experienced by students appear to have more impact.
- + Access to higher education for disadvantaged learners can be positively or negatively influenced by changes to both national and institutional admissions policies, and by how these policies are applied.
- + Supporting students who are engaging with the application process shows positive outcomes.
- + The information, advice and guidance which students receive from key stakeholders plays a key role in influencing HE application decisions and course choices.
- + A wide range of preparatory programmes are available across the HE sector and evidence suggests that they improve access for students wishing to address gaps in their qualifications or gain a head start to shorten the length of their HE studies. Students' motivations for participation are very mixed, as is the evidence of the impact of these schemes on widening (rather than increasing) access.
- + Outreach interventions have various aims including aspiration raising, enrichment, the development of academic and non-cognitive skills, increased prior achievement and attainment, motivations and HE decision-making and, ultimately, increased HE progression.
- + There is limited overall impact on enrolment rates across the themes.
- + The evaluation of 'black box' interventions is complex making it difficult to derive evidence of which elements of a programme may be the most instrumental in causing change.
- + The global differences in access contexts (socially, economically, politically) makes comparisons difficult.

Context

The 2017 review defined access as “the extent to which groups can gain entrance to different types of higher education institution” (Webb et al, 2017, 9) and considered the impact of UK policy changes such as the 2004 Higher Education Act and increases in tuition fees. It acknowledged the challenges to responding to the government's aspiration of increasing HE participation among those from disadvantaged backgrounds, within the changing landscape of higher education funding. In England, there has been some progress in narrowing the gap in higher education participation rates between

socio-economically disadvantaged students and their more advantaged peers. However, the sector remains highly stratified; particularly within 'high status universities', which typically have higher entry tariffs and offer higher economic returns in terms of graduate earnings and access to professional jobs (Sutton Trust, 2018). In recent years, efforts have been made to try to unpick the complex nature of the causes of inequality and the link between poor attainment at ages 16 and 18 has been shown to be a significant component in the low participation rates of some groups. However, other factors such as social background, low income, receipt of free school meals, school type, parental education, ethnic background and gender have all been shown to influence progression to HE.

Robinson and Salvestrini (2020, 5) evidence review concluded

“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.”

Similarly, this current review presents myriad evidence on intermediary outcomes, but little evidence of impact of the specified intervention of access metrics. This is a recurring theme across all four sections of this report. Establishing what works in access and outreach can also be problematic as these interventions operate with “complex social fields” where “generating unequivocal evidence... is notoriously difficult”, especially as these interventions often have “long timescales, diverse settings and myriad influences” (Harrison and Waller, 2017, 81)

As in the 2017 review, much of the current evidence emanates from the US where, for example, Advanced Placement (AP) and Dual Enrolment (DE) programmes are designed to encourage college participation, facilitate a smooth transition between secondary and post-secondary education, and alleviate some of the cost of earning a degree, specifically for students from low-income and disadvantaged backgrounds

The collated evidence presented focuses heavily on reducing the complex financial burden of a university education, and increasing the attainment, HE-preparedness and motivation of individual learners. It also considers the value of changes to admissions practices in increasing opportunity for those from under-represented groups, within the context of a reduction in affirmative action policies or using contextualised information to support admissions decisions.

Thematic findings

Webb et al (2017) themed their review and aligned impact into **finance** (including financial aid, scholarships and fees), **programmes of support** (including discipline specific, target groups and family, social and cultural capital) and **admissions/application processes** (by student characteristics and student behaviours). The current review similarly identifies **financial support for students, admissions and application processes, information, advice, and guidance, higher education preparation programmes, and outreach activities** as key themes in the literature.

Financial support for students

Robinson and Salvestrini (2020, 22) note that “financial barriers are often at the core of concern about higher education opportunities for disadvantaged students”, particularly in the context of rising costs and public concern about the affordability of higher education. Atherton’s (2020) international exploration of widening access work done by some of the world’s most elite universities, suggests that leading universities in the US have been the most successful in making a strategic commitment to increasing socio-economic diversity, and that financial support for those from low-income backgrounds needs to be ambitious and significant in scale in order to have a demonstrable impact.

Harrison et al (2018) conducted 98 semi-structured interviews with students from two contrasting universities to understand the impact of bursaries, which at the time were a statutory requirement in England. They found that students had little knowledge about bursaries before applying to universities and were unclear about eligibility criteria; bursaries therefore had minimal impact on their decision of where to apply to study. However, bursaries did play a role in helping to reduce stress and provide some degree of financial freedom, within the context of a “complex web of micro-spending decisions” (Harrison et al, 2018, 688). The evidence therefore suggested that bursaries are more likely to impact on student participation than on student access, corroborating the review evidence associating financial aid with retention and attainment outcomes.

While several studies have shown that financial aid had significant positive effects on college-level retention and completion, Lin et al (2020) note that the financial aid structures available to students progressing into higher education are complex and uneven, with some low-income students benefiting less than others from federal aid and institutional grants because of other barriers they face accessing higher education. Page and Scott-Clayton (2016, 17) found that while bursaries “may lead to improved access”, this improvement will be limited unless solutions address multiple barriers to college access, as these “barriers can interact, and successful transition to college requires navigating all or at least some combination of them”. Both these studies also highlight that access to higher education does not impact on the persistence or success of students in higher education if the institutions they attend do not have other policies in place to support their progression. This highlights the interplay between access, retention, attainment and progression which is evident throughout the evidence presented in this review.

Rhode Island’s Gaining Early Awareness and Readiness for Undergraduate Programme (GEAR UP) is an example of an intervention that aimed to address multiple barriers experienced by students from low-income households. GEAR UP offered programmes of academic enrichment as well as personal and social development, complemented by substantial college scholarship support to about 4,000 middle school and high school students each year. Fogg et al (2019, para 3) found

“substantial and statistically significant gains for a single cohort of GEAR UP programme participants relative to the comparison group on the likelihood of completing high school on time and immediately enrolling in college in the fall following high school completion.”

They also found that the GEAR UP programme had a positive and increasing cumulative effect for each successive year of education for participants relative to comparison group students (Fogg et al, 2019, see also Fogg et al, 2015). Sanchez et al (2018) compared 298 GEAP UP participants to 1,841 non-participants and found that GEAR UP had a positive and equalising effect on school attainment and progression into higher education. While evidence suggested that students with similar backgrounds to those that participate in GEAR UP experience poor success rates in higher education, “these [GEAR UP] students were just as likely to perform and persist on the university campus as compared with their freshman peers” (Sanchez et al, 2018, 344).

The evidence suggested that the availability of financial support had limited impact on access for low-income students wishing to progress into higher education. However, if this support is accompanied by other interventions that address intersectionality and the multiple barriers experienced by students, it will have significantly more impact on increasing access to higher education and across all elements of the student lifecycle. This tailored approach is highlighted by Farrell et al (2020) in their qualitative evaluation at Dublin City University of the of Universities of Sanctuary scholarship for refugees. They found that the “scholarships can facilitate participation in HE for refugees, provided that the necessary support to address the financial, structural, cultural and digital equity barriers is in place” (Farrell et al, 2020, 1). Robinson and Salvestrini (2020, 23) caution that “there is a severe lack of evidence on the effectiveness of student aid in encouraging higher education participation for the UK” and there is little unequivocal evidence of the effectiveness of financial aid alone on enrolment.

Admissions and application processes

The evidence pertaining to institutional admissions and applications processes provides a complex picture. Adaptations in admissions processes, such as contextual and holistic decision-making, provided mixed results, and did not benefit all groups of students equally. The evidence relating to supporting students with application processes, for example the completion of personal statements, is generally positive.

An experimental simulation in the US collected data from 174 selective US colleges and universities to evaluate the impact of contextualised information about applicants’ high schools on admissions decisions. The results reported by Bastedo and Bowman (2017) indicated that contextual information can play a substantial role in decision-making about applications from students from low socio-economic groups, with admissions officers showing a willingness to reward applicants for overcoming obstacles rather than penalising them for attending an insufficiently ‘rigorous’ high school.

The increased consideration of class-based disparities was not found to have a corresponding negative influence on their leniency towards applicants from higher socio-economic groups. A further study by Bastedo et al (2019), used randomised-controlled trials to determine whether providing students’ test scores in context with how they performed relative to their school and neighbourhood peers would increase the likelihood of admission officers recommending the admittance of low-socioeconomic status applicants. They found that “admission officers that received the contextualised

information were significantly more likely to accept both the low-SES and high-SES applicant than those without contextual information on test scores” (Bastedo et al, 2019, 1). However, they go on to caution that contextual “information may not serve to ‘level the playing field’ between higher- and lower-SES students” as admission officers still give “preference to applicants from high schools with high average SAT scores, regardless of how they compare with their similarly situated peers” (Bastedo et al, 2019, 23).

Some of the recent changes to US admissions policies have been made within the context of a reduction in affirmative action practices in public universities. Black et al (2016) evaluated the impact of an initiative in Texas that replaced affirmative action with automatic admissions which admit students based solely on their rank within the top 10% of their high school graduating class. Advance statistical modelling that controlled for multiple levels of selection (college entrance exams, high school exit exams and advanced high school coursework) was used to create a comparison of the Texas system with those used by other states. The results suggested that the addition of the extra admissions criteria raises graduate attainment, but severely decreases the representation of minority groups (particularly Hispanic and Black students) and those from a low-income household.

A similar approach was used by Bleemer (2019) at the University of California to assess the impact of the institution’s Eligibility in the Local Context programme across its various campuses. Bleemer (2019) analysis showed increased enrolment of under-represented groups by an estimated 4%. When combined with other initiatives such as ‘holistic review’, which includes students’ experiences and attributes, alongside academic metrics, enrolments were raised by about 11%. However, there are concerns that some of those students may have enrolled anyway at other campuses within the institution, and neither approach achieved the 12% increase in admissions reached by affirmative action.

The implementation of holistic admissions, alongside greater consideration of applicants’ experiences and attributes, was undertaken in an attempt to increase the admission of students from under-represented groups to a US nursing college. Zerwic et al (2018) noted that the change saw a significant increase in the admission of Hispanic students, which was in line with increased representation across other subject disciplines within the same institution. However, as there was no corresponding increase in admissions of males, or students from other ethnic groups, the extent to which there was a causal link was unknown.

Similarly, Brecheen’s (2017) thesis hypothesised that those universities which assigned higher importance to social capital factors, such as knowledge, skills and behaviours, in holistic admissions would have a higher proportion of enrolments from underrepresented groups. However, findings from their study showed this was not the case, as no single social capital factor or combination of factors was positively associated with both African American and Hispanic enrolment. They suggested that race-based admissions policies are a necessary means of achieving diversity and increasing access to higher education.

Most UK higher education providers assess applicants' eligibility for admission primarily by referring to the achievement of academic qualifications, and the holistic admissions practices commonly seen in the USA are not as prevalent in the UK (Centre for Social Mobility, 2018). The role of contextualised admissions is still debated; qualitative research with key stakeholders from the higher education sector revealed that some believed contextual admissions should primarily be used to affirm grade-based decisions (Mountford-Zimdars et al, 2021). However, Boliver et al (2021), argue that a contextualised approach to admissions is essential if the ambitious widening access targets set by the Office for Students are to be achieved. Boliver et al (2021) recommend that, to eliminate the socio-economic gap in access to higher tariff higher education providers in England, entry requirements need to be reduced for some learners, in recognition of the fact that their full potential is not necessarily reflected in their grades. While the use of contextualised admission is increasing in the UK, there is limited Type 3 evidence showing a causal impact on access and beyond.

Finally, in relation to the admissions process, there is some evidence from the US which explores the negative impact of performance-based funding on grade-based admissions decisions. Analysis by Gándara and Rutherford (2020) suggests that performance-based funding has a negative effect on underrepresented student enrolment when the data is focused on those with lower standardised test scores and no parental history of HE participation.

Some studies have suggested that the application process itself is partially responsible for the lower access rates of disadvantaged students in higher education. Personal statements are used as part of the UK university admissions process, but these have been shown to advantage some applicants over others, especially those from privately funded schools (Jones, 2016). However, an evaluation of the Academic Apprenticeship programme, which took a new approach to personal statements through structured activities that enabled participants to showcase their "academic suitability for a course, particularly by offering detailed analysis of a topic that went beyond the A-level syllabus" (Jones, 2016, 1), showed that all Academic Apprenticeship participants received at least one offer from a Russell Group university compared to 73% in the control group, and 60% went on to be accepted by a Russell Group university compared to 40% in the control group (Jones, 2016). Oreopoulos and Ford (2019) also found that additional and personal assistance with the applications process could have a positive impact. Three workshops were run with students at Ontario high schools where fewer than half of their graduates progressed to post-secondary education. The interventions resulted in a 5% increase in college enrolments overall, and a 9% increase among students who were not taking any other additional HE preparation courses.

A study conducted in Germany by Ihme et al (2016) noted that, although the promotion of diversity information and imagery on university websites is a popular endeavour, there has been little research on whether, how and why diversity recruitment strategies affect students' enrolment decisions. Ihme et al's (2016) investigation into the effect of emphasising age diversity found that information on an age-diversity friendly environment was valued by mature students in terms of their perception of person-organisation fit. Interestingly, this emphasis had no negative impact on the perceptions of younger students in relation to their own perceived status within the institution, indicating that a promotion of age diversity is unlikely to prove off-putting for younger students.

Information, advice and guidance

The provision of information and advice on HE opportunities is often embedded into outreach interventions such as taster days, summer schools and mentoring, as well as preparatory/bridging programmes, but a range of discrete guidance activities are also widely employed, sometimes in an attempt to address the information barriers which may be faced by students from underrepresented groups. These perceived information barriers relate to course choice, provider choice and targeted low-earning careers guidance, although other structural social-economic barriers (fees, location) may be having a greater impact (Archer et al, 2021). The impact of support and guidance professionals (counsellors, teachers, career advisors) was particularly pertinent.

The latest evaluation of the impact of the UK OFS-funded outreach programme Uni Connect, by Bowes et al (2021), analysed the findings from a longitudinal survey of Uni Connect target learners.⁸ In tracking the data of 4,282 learners in phase 1 (2017 to 2019), they found that the programme had increased most learners' knowledge of HE, accommodation options, associated costs and potential enhanced employment prospects. In relation to information, advice and guidance, some disadvantaged learners still reported limited knowledge, and limited evidence was presented of impact on individuals' subsequent perceptions of self-efficacy and social identity.

Access to informed counsellors was highlighted as relevant, with Robinson and Roksa (2016) suggesting that counsellors were a valuable resource for all students. They were particularly important in mitigating the lack of social and cultural capital in families with low socio-economic status, given the potential lack of availability of other sources of information and support. Matthews (2017) explored a Community College programme in North Carolina run by academic advisers employed by the college who were embedded in nine local high schools over a four-year period. The programme acknowledged the challenges high school counsellors face in fitting advice on college-going and college application support into their schedules. A quantitative analysis of the impact of the presence of embedded advisers revealed a strong statistically significant link between the work of college advisors and participation in dual enrolment programmes. This suggests that investing HE resources within local schools in a sustained way, alongside school employees, can strengthen the knowledge and support base for students, including those from underrepresented groups.

Robinson and Salvestrini (2020, 31) refer to an explorative study in the US which discussed the online support available to students engaging with careers and education guidance to make informed choices about their college applications. The report highlighted the value of school counsellors in providing early and continuous exposure to college information and reflects on the expansion of the counsellors' role over time, with an increase in both administrative duties and the provision of pastoral support for students, and a reduction in staff ratios which mean that individual staff members are supporting increasing numbers of students. The study considered the career readiness platform

8 With 29 partnerships of universities, colleges and other partners across England, the programme delivers information, advice and guidance on the benefits and realities of going to university or college for pupils in years 9 to 13, living in areas of low HE participation.

Naviance, which was used for a range of activities including academic planning, developing college 'readiness' and exploring career options. An analysis of the access to Naviance by Christian et al (2017) students (n=1,917) showed that those students who logged on to Naviance most regularly and for the longest periods of time had a higher rate of application to college programmes. The impact of carefully framed and well-timed light-touch 'nudges' such as text messaging to prompt students to carry out particular tasks and reduce inertia during the summer before commencing their HE studies is noteworthy (Page and Scott-Clayton, 2016). The impact of such an approach is also referenced in the attainment evidence.

Similar evidence reflects the impact of positive relationships with pre-HE teachers. An analysis of the Educational Longitudinal Study of 2002 (sponsored by the National Center for Education Statistics) looked at US students' trajectories from the beginning of high school into post-secondary education, the workforce and beyond. Its purpose was to collect information that would help determine the factors that affect the educational, social and personal outcomes of children, and the data has been used for a wide range of quantitative studies, including analysis of the role of high school counsellors and their relationship to the rates of HE application. A study published in 2016 (Robinson and Roksa, 2016) suggested that these counsellors are a valuable resource for all students, and therefore they are particularly important in mitigating the lack of social and cultural capital for families with low socio-economic status, given the potential lack of availability of other sources of information and support.

More than 10,000 student records from the 2003 cohort of the Longitudinal Survey of Australian Youth found that students who reported a positive relationship with their teachers and had a positive attitude towards their school were more likely to progress to university (Tomaszewski et al, 2017). The same was found for students receiving career guidance from universities and career advisers. In comparison to Sanders et al (2018), who used a random control trial to evidence a positive impact of inspirational talks from student role models, Tomaszewski (n = 10,027) used 'event history modelling' to report that talks by employers and group discussions about career options were negatively associated with university progression (measured by enrolments). Further work should examine this impact in other country contexts.

Malott et al (2020) similarly explored the impact of peer support on college readiness. An initiative in Pennsylvania was designed to encourage students from a high school with a predominantly Black/African American population to participate in small group college-readiness activities, using a safe space to explore concerns about how their identities may impact on their future educational experiences. Small groups were promoted as a means of tailoring topics of discussion and meeting the needs of individuals, facilitating peer support and encouraging confidence-building, particularly in relation to seeking help.

Preparatory higher education programmes

While Webb et al (2017) made references to long-term programmes that aimed to prepare school students for higher education or enable them to access university credits while still in school, it was not a distinct section. However, this review found a substantial number of sources that referred to these

programmes and which warranted a more thorough overview. In particular, there was an increase in evaluations from the US of accelerated college credit schemes such as Advanced Placement (AP) and dual-enrolment/dual-credit that enabled students to work towards credits for both high school diplomas and higher degrees. This appears to be in response to the Obama administration decision in 2016 to allow high school students to access federal grants to take dual enrolment courses. This policy aimed to increase access and give students from low-income households, who are underrepresented in early college programmes, a chance to earn credits toward a degree and save money on higher education. This intervention was ended in summer 2021 but its long-term impact will continue to be evaluated.

While the evaluations of dual-enrolment programmes found that they increased college enrolment, they also highlighted that they may not be benefiting students underrepresented in higher education as expected. Acceptance onto these programmes was often predicated on higher school attainment, which means students from certain backgrounds who have faced educational barriers and would benefit the most are excluded (Davis et al, 2017; Pierson et al, 2017). Pierson et al (2017) found that students on these programmes were more likely to be female, white and not economically disadvantaged. Moreno et al (2021) found equity gaps in participation between black and socioeconomically disadvantaged students on these programmes, and that these participants were less likely to progress to a post-secondary institution than their peers. Similarly, Jagesic et al (2020) also found that minorities were less likely to be involved in the advanced programme AP Capstone Diploma. However, they also found that the programme had a positive impact on secondary and post-secondary educational outcomes for students from all backgrounds.

The contradictory findings of Moreno et al (2021) and Jagesic et al (2020) in relation to the impact of the programmes on underrepresented groups show more work is needed to understand the mechanisms that impact on the success of dual enrolment. Lile et al's (2018) mixed method study used a survey and focus groups to understand how these programmes benefited students. They found that the dual enrolment programme "helped to enhance participants' clarity of the college-student role, including who attends college, what skills are required, what college can lead to, and their own self-identification as college students" (Lile et al, 2018, 95). They suggested that this might be of particular benefit:

"for students of lower socioeconomic status, [as] dual-enrolment programs can provide additional knowledge about the transition to college that higher-SES students find elsewhere... [and] seems particularly important for first generation students and other groups who may not have the social networks to help them understand and be successful in the higher education system." (Lile et al, 2018, 107-108)

Trost's (2016) thesis also found that disparities in participation existed for students of colour in dual-enrolment programmes throughout the state of Minnesota, regardless of school type, composition and location. They suggest that these programmes perpetuate structural racism, as students of colour are often overlooked for advanced or dual-enrolment courses. They go on to suggest that participation gaps can be overcome if high schools implemented practices to overcome structural racism.

They share two case studies from urban, high-minority high schools that successfully implemented policies and practices that promoted and recruited students of colour into dual-enrolment programmes. The key to this success was creating an “an environment where taking challenging courses was becoming the norm, and students had a place to safely fail” (Trost, 2016, 195).

Trost’s (2016) work also highlights the need for access intervention design to pay particular attention to specific barriers and challenges for certain students accessing higher education. The following studies in the last part of this section concern programmes from the US, Australia, England, Northern Ireland, Scotland and Ireland that perform a similar function to dual programmes but are aimed at specific students or designed to address specific barriers to student experiences.

Mejia et al (2019) found, that when a group of colleges broadened access to transfer courses, therefore bypassing the need for remedial courses, that access, student success and progression onto further study increased for all types of students. In Australia, enabling programmes are used to support the access of students that do not have the academic requirements for undergraduate study by allowing them to meet entry requirements and prepare for the rigours of study. Taylor et al’s (2020, 69) examination of institutional data showed post-enabling students performed better in “undergraduate programmes than traditionally enrolled students when grade point average (GPA), success and retention rates were compared”. Interviews with post-enabling students also revealed that these programmes created improved confidence and resilience in undergraduate study.

Some selective universities in the US run intensive, multi-intervention access programmes on a smaller scale for high-attaining students from disadvantaged groups. Millet et al (2018) highlight the Princeton University Preparator Program (PUPP), which targets local low-income students, providing 24 of them each year with an intensive three-year programme focusing on the development of academic skills and college-culture awareness, alongside social support and mentoring. Activities include summer schools, college visits, cultural events, and personalised academic advice and guidance on college and financial aid applications. The evaluation used alumni survey data from 2004-2015 (n=126) and found multiple positive outcomes, including that 98% of respondents attended colleges (including selective colleges) directly after high school and 89% attributed this access to the PUPP. The benefits of social networking and personal support were also cited.

Finally, O’Sullivan et al (2019) found that there were higher levels of confidence, feelings of belonging and academic identity among students that had completed a foundation year before their undergraduate study compared to similar students who accessed undergraduate studies via a contextualised offer. Interestingly, they also found that foundation year students were from more “disadvantaged backgrounds than their contextualised peers”, which they suggest illustrated the “need for diverse widening participation routes that cater to a ‘wide range of needs’” (O’Sullivan et al, 2019, 554). In the south east of Scotland, a programme designed to ease the transition between school and university, by giving students access to classes at college and university while still at school, was found to be beneficial in developing students’ communication and independent learning skills, as well as their confidence, which were considered “important in enhancing transition” (Farhat et al, 2017, 23).

Outreach interventions

The evidence of outreach impact on access into HE is complex but, as Robinson and Salvestrini (2020, 5) suggested, most current evidence has reported “positive but moderate effects”. Causal evidence is lacking, and Barkat (2019) noted some practitioner reluctance to adopt experimental designs due to practical and ethical challenges.

A variety of outreach programmes are summarised below with several associated aims including: **aspiration raising, enrichment**, the development of **academic and non-cognitive skills**, increased prior **achievement and attainment, motivations and HE decision-making**, and ultimately increased HE progression. The cited outreach interventions have been themed based on these aims. Many of the approaches cited in this review combine multiple ‘black box’ interventions with more than one activity embedded within a programme.

Robinson and Salvestrini (2020) suggested that outreach activities in the UK are still heavily influenced by the notion of ‘raising aspirations’; a term used previously as part of the 2004 to 2011 Aimhigher programme to refer to the desire to enter higher education, realise potential, gain a qualification and improve one’s life chances. The increase in outreach activity initiated during that period was largely informed by the notion that disadvantage may be overcome by awareness-raising, combined with a desire to succeed. Robinson and Salvestrini highlight Aimhigher Plus in the West Midlands (now funded by UniConnect), a newer multi-intervention approach to outreach, which is showing positive results. Preliminary evidence from the built-in evaluation component suggests that students who engage in the programme are more likely to be accepted into HE than those who do not (Robinson and Salvestrini, 2020, 23).

Further insights into the university experience are commonly offered by summer schools, which are mostly targeted at disadvantaged young people who are unfamiliar with higher education, in the hope that students will develop aspirations and social and academic confidence. Robinson and Salvestrini (2020, 32) note that they “appear to be successful in raising aspirations and developing a better understanding of the higher education world”, including stronger intentions to participate in HE and confidence in engaging with the application process. However, while such initiatives have been shown to remove feelings of alienation and have demonstrated an impact on student intentions, their direct effect on enrolment is less certain.

Highlighting the importance of practitioner reflections in the access evidence base, Harrison and Waller’s (2018) explored efforts to widen participation in England across two generations of practitioner-managers and critique the emphasis placed on raising aspirations and possible future selves. Qualitative findings from current WP managers suggest that perceived effectiveness related to

“close pedagogic contact between young people and HE staff or students, supplementing teaching in schools through curriculum enhancement activities, revision workshops, after-school clubs or one-to-one tutoring.” (Harrison and Waller, 2018, 930)

Based on their evidence, Harrison and Waller (2018) recommended redirecting some of the resources of university careers services towards outreach work, in order to raise awareness of careers and the importance of decisions about qualifications.

Harrison and Waller (2018) also discussed attainment rather than aspiration as the primary difference in levels of HE participation for different social groups. A college access programme widely adopted across the US has been shown to increase access for some disadvantaged student groups. Kolbe et al (2018) reported that the Advancement Via Individual Determination (AVID) scheme specifically aimed to improve high school attainment and college progression for 'middle-achieving' students across 43 HE providers. AVID is a resource-intensive intervention which requires sustained investment to incorporate courses on organisational and study skills, and critical thinking, alongside academic support, college visits and support for financial aid applications and career planning. Priority was usually given to students who were from ethnic, linguistic or socio-economic backgrounds which are underrepresented at four-year colleges and universities, and participants were more likely to qualify for free school meals. This matched sample evaluation (n= 2,996) found that AVID showed promising results relating to college readiness and matriculation for these underrepresented student groups.

In common with many UK outreach initiatives focused on enrichment, the targeted Academic Enrichment Programme (AEP) at the University of Birmingham (Barkat, 2019) used a weighted range of socio-economic measures to identify high-priority local students experiencing social/economic disadvantage. These students participated in a week-long residential at the university at the end of Year 12, a Facebook group, one-to-one mentoring from undergraduates and two study skills sessions during Year 13. They applied a 'Theory of Change' approach and reported outcomes of sustained engagement with student cohorts over time on students' motivation, preparedness and HE application rates. The report stated that the AEP seemed to promote academic attainment, with AEP students outperforming national and regional benchmarks, as well as having increased entry rates to the sampled Russell Group universities. The outcomes of other enrichment activities which aimed to enhance non-cognitive skills have also been reported; Richmond and Sibthorp (2019) found that outdoor adventure experiences increased confidence, self-belief, help-seeking and motivation to overcome challenges; Geagea et al (2017) explored participation in arts activities and found higher expectations of progressing to university in participants; and Morris (2016) examined the impact of high school extra-curricular activity participation (eg sports, community and arts activities) on envisioning future educational possibilities and found expectations and noncognitive skills to be important mediating factors. In all of these studies, evidence of longer-term impact was limited. It is important to recognise that family background, income and opportunities for educational and social development (for example, funded/non-funded participation) are likely to have a significant impact on a student's exposure to these activities.

Finally, interventions which embed mentoring support and guidance are widely used both in the US and the UK as a means of trying to influence young people's motivations and HE decision-making. A 2020 review of outreach interventions found that enabling less-advantaged pupils to develop mentoring relationships with older, more experienced individuals with relevant industry experience and established contacts can provide "an essential source of middle-class social and cultural capital

that is absent in their own networks” (Robinson and Salvestrini, 2020, 25). Student ambassadors were also regularly used to provide potential applicants with a role model. Sanders et al (2018) conducted an experimental evaluation of their efficacy in encouraging students from low socio-economic backgrounds to apply to selective universities over a three-year period in the southwest of England. Their evidence supports the hypothesis that an inspirational talk from a current student encourages students to apply to more universities, particularly those within the Russell Group.

Farhat et al (2017) examined the South East Scotland Academies Project (SESAP) which aimed to offer a similar experience for 15-18-year-old students taking industry-related qualifications in health and social care, hospitality and tourism, food science and nutrition, and creative industries. It provided one- and two-year programmes to facilitate entry to the second year of an undergraduate degree course. The programmes include experience of working in industry, alongside independent learning, mentoring activities and advice on career/university choices. Farhat et al (2017) found that over 80% of participants reported an increase in confidence, communication skills and industry knowledge, as well as an increase in the likelihood of progressing to college or university. The report does not distinguish between advantaged and disadvantaged groups, but the summary data gives a promising indication of the potential for such programmes to increase HE participation for those pursuing non-traditional routes.

Gaps in the access evidence

This review identified a lack of causal evaluation of UK-based interventions. Much of the evidence in this report emanated from the US, highlighting key issues for the interpretation of findings to other contexts. The review also highlighted differences in the complexities of financial structures and funding sources, which vary between institutions, as well as between states in the US. Differences between international education and funding systems, and political and social landscapes, present challenges when seeking to identify initiatives that might be replicated. An additional global challenge is the evaluation of ‘black box’ interventions; those which are developed and delivered by multiple institutions, and are comprised of several aims and activities, making it difficult to derive evidence of which elements of a programme may be the most instrumental in causing change.

Most of the examples encountered concern high school students aged 16-18, and very little literature was identified in this search which referred to improving access for learners who are mature or part-time, have vocational or non-standard entry qualifications, or are seeking to study online. Similarly, there is a gap in relation to UK students accessing free school meals. Barriers to access for disabled students and care leavers were occasionally referred to in small-scale studies, but there were very few examples of effective larger-scale interventions which targeted these students.

Several articles were identified in the initial search which related to the challenges of addressing access to STEM subjects for women and those from underrepresented ethnic groups. While research was conducted in recent years to further an understanding of the experiences of STEM students within those groups, no interventions were identified which demonstrated evidence of impact in widening or increasing their access to higher education.

A number of references were made within the literature to the number of eligible students who 'undermatch' (apply to institutions that are not well-aligned to their academic credentials), but no evidence was found of interventions which were shown to have a causal effect on reducing such instances.

Methodological limitations

This exploration of recent literature aimed to highlight approaches which had a demonstrable impact on the extent to which student groups can gain entrance to different types of higher education institutions. The difficulties associated with providing Type 3 (causal) evidence are acknowledged; in part because interventions tend to operate within complex environments which are affected by a range of social, economic, political and cultural factors. A further barrier is the long-term nature of some interventions, which require significant sustained resource and the tracking of student progress over several years to effectively demonstrate a positive impact on access. There are very few examples among the literature identified for this review which employ experimental methods which might seek to establish the difference between what happens to those who receive an intervention and what happens to those who do not. There are resource, ethical and practical considerations which need to be considered when seeking to identify appropriate control groups in a higher education setting. This can lead to the identification of the counterfactual condition as an alternative; postulating what would have happened to a particular cohort of students if the intervention had not taken place.

Some initiatives are designed as quasi-experiments, where allocation to the cohort experiencing the intervention is targeted rather than randomised, and some empirical evidence is available from studies included within this review regarding the efficacy of widening access strategies employed on this basis. The largest proportion of literature identified within the access category employ regression analysis, to estimate the relationships between interventions and variables such as ethnic or socio-economic group.

Retention

Summary headlines

- + The retention area focused on evidence of retention, persistence and intention to persist from 25 sources of literature; 18 from the US; the rest from the UK, Ireland, Australia, Spain, Germany.
- + Seven of these sources (six from the US) evaluated evidence of impact of a specific intervention, which in some cases was a programme of activities, making identification of 'most impactful intervention' challenging (as per Wilson and Dauncey, 2020).
- + The remaining sources measured pre-existing variables, either relating to the student or the institution, and provided complementary evidence to the key findings from the intervention-based studies.
- + The use of learner analytics is evidenced as appropriate for identifying/predicting students at risk of withdrawal and can be an important data source for evaluating impact. Providing interventions early in the student journey and recognising the importance of early markers of achievement (assessment engagement and credit completion) is noted as influential.
- + Student interactions with academic staff, classroom and campus are evidenced as associated with an intention to persist. Pedagogic strategies of which enable interaction are seen to validate a sense of being known and valued (belonging).
- + The importance of learning communities, in various forms, was evident, with the impact of peer interactions (mentoring, coaching, collaborative learning) particularly noteworthy in the association to retention measures.
- + Findings indicated that interventions which enhanced (or could enhance) a sense of belonging, validation (or 'mattering') and self-efficacy were likely to positively impact persistence and retention – 'mattering' includes the provision of non-academic personal support such as financial aid.
- + The majority of studies were single institution and / or discipline based, potentially limiting generalisation.
- + Other evidence limitations are common throughout this rest review – disciplinary skew, limited intervention replication and lack of depth in the exploration of differential impact on specific student groups.
- + An additional source (Wilson and Dauncey, 2020) used a similar methodology to this review and also provides some complementary evidence to the thematic findings, notwithstanding the caveat regarding the difficulty of attribution effect.

Context

Webb et al (2017) provide a rationale for focusing on retention, and three key contextual factors relating to student continuation were identified; national competitiveness in relation to the economy and the need for graduates; individualistic discourse regarding personal achievement and social mobility, and the negative financial, social and emotional consequences of failing to complete; and a critical social theory perspective regarding social justice and equity between disadvantaged groups. The review also noted that the mission of an individual university was influential in terms of the types and natures of interventions. Arguably, in the UK context, perhaps the strongest driver currently for an increased focus on retention is financial survival, given the current political landscape regarding the funding of universities and the 'value for money' debate. Meeting a key performance indicator in relation to retention could be the difference either between financial viability or insolvency, given the operating margins at some providers, particularly teaching-focused institutions. This is not to deprioritise the social mission of many universities, and their long-standing ambitions to combat societal and structural disadvantage by widening participation and striving for equality of achievement in higher education.

As with the Webb et al (2017) review, much of the literature, of which 70% is from the US, uses a theoretical framing of Tinto's (1975) 'institutional departure model', and his subsequent 'student retention model' (Tinto, 1993), which has been cited enough to be referred to as 'seminal'. It defines the key factors influencing student retention as integration into formal and informal academic and social systems within the university. However, the language of 'integration' and 'incorporation' has resulted in critique, particularly in relation to researchers interested in the concepts of belonging and who feel that the assimilation of students into the life world of the university is not the approach an inclusive 21st century institution should adopt (Johnson et al, 2020; Simmons and Smith, 2020; Snyder, 2017). As such, an updated interpretation of the principles within Tinto's (1975, 1993) work is reflected in some of the literature reviewed, with the concept of 'faculty validation' (Arshad-Snyder, 2017) replacing that of 'integration', which reflects the concept of 'mattering' (Flett, 2018; Flett and Nepon, 2020) and that of belonging:

“[the] perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the campus community.” (Strayhorn, 2018, 4).

As with the 2017 review, measures of retention within the literature vary, from advancing to the second semester of a first year; enrolling in a second year; and completing the course of study. Ultimately, the interventions and variables evaluated focus on reducing withdrawals – and as with the first review, this is conscious of the interdependency between access, retention, attainment and success. A limitation of much of the literature reviewed reflects the findings of Wilson and Dauncey (2020, 4) in that

“many interventions conducted in practice within a live higher education setting struggle to attribute effect, given the presence of many other student engagement initiatives occurring at the institution during the same period.”

The 2017 review used the terms 'retention' and 'persistence' interchangeably, noting that 'persistence' is more common in literature from the US, which this review also acknowledges. However, this review will separate out the terms based on (Hall et al, 2021, 205) definitions:

“Retention and persistence are different perspectives on the same process: students' continual enrollment until graduation. Whereas the study of student persistence focuses on the students' attitudes and behaviors as associated with their educational attainment, the study of retention focuses on institutions' environments and processes as associated with continued student enrollment through graduation.”

As such, although this is not mutually exclusive by any means, persistence research tends to be focused on what the student does (or feels), and retention research tends to be focused on the institution does (or does not do), as well as being a hard measure of continued enrolment. Much of the literature from the US measures persistence, either intended (focused on students' 'intention to persist'), or actual – which equates to whether the student is 'retained' and as such is a measure of retention. In discussing the relevant literature, this review will make clear what was being measured and how. In many cases, despite the focus of this review on prioritising research from impact-based interventions, much of the persistence and retention literature was focused on attempting to ascertain relationships between pre-existing variables. For example, identifying student demographics or characteristics, student perceptions of their experiences, or existing institutional practices, then extracting either intended persistence or actual retention and analysing the data to theorise which variables may have an impact (positive or negative). However, some authors did set out to evaluate a specific intervention, and these sources are identified.

Thematic findings

Webb et al (2017) identified three broad types of intervention that had a positive impact on student continuation: **financial interventions; timely and targeted programmes** (both whole course approaches and those focused on the first year, such as summer bridging courses); and **curricular and pedagogical interventions**. This current review found much in the more recent literature to support and build on previous findings, but will frame the findings in a different way, presenting a post-pandemic perspective on what universities may need to prioritise to support student retention.

To introduce this approach, it is useful to pick up where the previous review of retention left off in relation to the 'future of retention research' – **learner analytics**. From here, the review will explore interventions related to the concepts of belonging; mattering and self-efficacy – the inter-related nature of **faculty interactions / validation; learning communities, curriculum and pedagogical design** with specific focus on early assessment and collaborative and active learning; and finally, **'non-academic' personal support**, predominantly in the form of financial aid.

Learner analytics

Three reports are of particular note in relation to the rapidly expanding field of 'education data mining' (EDM), the application of predictive models to the increasing amounts of 'big data' that universities hold on their students to inform interventions. Shorthand for this is 'learner analytics', with various providers vying for business among HEIs in the UK, Europe and the US.

While the use of different EDM packages was noted in several of the studies reviewed, Hall et al (2021) offer a cautionary note in their report, suggesting that the inaccuracy of the predictive data for the study body (N=4,521) potentially nullified the effectiveness of the intervention (targeted coaching):

"If the predictions were incorrect, then coaches either did not coach the students who needed to be coached, coached students who did not need coaching, or assisted the students who needed to be coached but used inaccurate success indicators for the students." (Hall et al, 2021, 228)

Responding to the lack of literature on the most effective use and design of analytics packages, despite the importance of retention to universities (and to students themselves) Ortiz-Lozano et al (2020) have produced an interesting study that tried to pinpoint the best time and best data to identify students at the most risk of withdrawal. While acknowledging the recommendations of other studies to adopt a holistic, transformational approach to retention strategies (Thomas, 2012a; Tinto, 2006), they note that a target-driven approach is supported by others such as Brooman and Darwent (2014) to reduce withdrawal and prioritise resource for time-poor staff. Building on prior studies identifying the first year as the most appropriate time to identify at-risk students, they analysed data from three points within the first year.

To construct their predictive model, Ortiz-Lozano et al (2020) used Classification and Regression Trees (CART) and Quick, Unbiased, Efficient, Statistical Tree (QUEST) algorithms. The target variable was student drop out, and the students' socio-demographic and academic data were the predictors. The study was medium sized (N=935) and discipline specific (electromechanical engineering degree) within one institution (Universidad Pontificia Comillas in Madrid) – the limitations of its scope are acknowledged, and their authors do not propose a 'one size fits all' model. Nevertheless, the conclusions drawn offer potentially important guidance as to how institutions should be using analytics – and consequently, for the design of curricula. Ortiz-Lozano et al (2020) results confirm earlier studies which indicate that academic results are better predictors of withdrawal than socio-demographic data (Esteban-García et al, 2016) and evidence that accurate prediction of withdrawal is predicated on students being academically assessed early in their academic journey – if students do not engage with assessment at all, this is in and of itself a dependable risk indicator for withdrawal. This then leads to recommendations regarding curriculum design, and the data that is used to feed learner analytics systems to prioritise intervention and targeted support.

Relating to these recommendations, Scherzberg's (2017) thesis reviewed four years of longitudinal student transcript data through transcript analysis, with a particular focus on 'transfer shock' – something of particular importance as universities reconsider effective and supportive transition into higher education in the post-Covid world. Descriptive statistics, frequencies, Chi-square tests and logistic regression were used to analysis the large dataset to determine what factors were predictors of persistence and completion. Her results showed that students' first year attempted/completed credits ratio was one of the significant factors influencing retention; this adds further support to the concept that designing early opportunities for students to be assessed and experience a sense of achievement is a key factor in their persistence.

The third study of interest in relation to learner analytics also comes from the US and is a thesis from Kehoe (2017) – a large scale mixed-methods study of the impact of whole course targeted programme of support mechanisms for students – the Dell Scholars⁹ programme. Their work builds on a previous study indicating that the programme had a nine percentage-point and 16 percentage-point impact on four- and six-year bachelor's degree completion rates, respectively (Page et al, 2017). Kehoe's (2017) work extends this initial study to evaluate the impacts beyond the original threshold, including comparison with a control group (students of similar demographics not in receipt of the programme – n=16,680) and to explore 'how' the programme works for the Dell Scholars (n= 2112) as the evidence from both studies suggests that it does.

The whole programme approach aligns with Webb et al's (2017) review findings in relation to targeted and timely interventions to support retention. Dell Scholars provides funding (\$20,000), a laptop with four-year warranty, credits (\$500 annually for four years) for textbooks, a resource network that connects students and their families with resources to deal with stress, debt, managing childcare, and life circumstances, and a teletherapy service that provides students with professional counselling (Dell Scholars, 2021). The impact of this support is evidenced in both studies, with Kehoe's later work finding that

“Dell Scholars are approximately four percentage points and nine percentage points more likely than their matched counterparts to persist into their second and third years of school, respectively.” (Kehoe, 2017, 70)

Kehoe (2017) also found that this effect was amplified in less selective institutions.

However, it is in the 'how' part of Kehoe's study that the relationship to learner analytics becomes evident. The author identifies that one of the key programme components driving the observed impacts is “the programme's use of a proactive, data-informed support system that is highly responsive to persistence risk indicators” (Kehoe, 2017, 88). While this operates along with other key components, including flexible, client-focused practices, and continuous quality improvement strategies (Kehoe, 2017), the implication is that framing intervention strategies around data-informed risk indicators is an essential mechanism with which universities should be designing their approaches. Together with the findings from Ortiz-Lozano et al (2020), this makes a case for the appropriate use of learner analytics.

Faculty interactions/validation

The term 'faculty validation' is used by Arshad-Snyder (2017) in her thesis exploring the role of 'faculty validation' in students' intentions to persist; it is a term related to 'faculty interactions' (the interactions that students have with academic staff), and is in other studies defined as 'faculty engagement' (Burnette, 2017) where those interactions result in students feeling "known and valued" (Arshad-Snyder, 2017, 2). The study is small scale (N=89) and within one institution, exploring the experience of online students – something of increasing relevance in the post-Covid world. The findings demonstrated that

"faculty-initiated interactions, particularly those that reflect an interest in students' learning and success, interactions that lead to students feeling encouraged, and interactions that appertain mentoring, can predict academic integration and persistence." (Arshad-Snyder, 2017, 61)

Dwyer's (2017) longitudinal study also examines 'student-faculty' interactions and persistence. This mixed-methods case study of one 'commuter' institution in the Republic of Ireland included a questionnaire (n=248), focus groups and interviews with students, including those who withdrew from higher education, ensuring that the student voice and perspective was embedded in the research. The persuasive argument at the centre of this study, developing Tinto's (1993) ideas is that

"the processes of social integration...maybe wrapped up in the academic; the academic integration of students may be through the social and vice versa... the classroom... is not only a source of academic integration and thus persistence but also as a potential source of social integration via the academic interactions with faculty." (Dwyer, 2017, 327)

Analysis of quantitative and qualitative data found that student faculty interactions in the classroom did influence the persistence of students; he expands this to note that active teaching approaches that led to students feeling 'included' also had a positive influence. This once again links to the theme of pedagogical and curriculum design, also evident within the attainment section of this report.

Burnette's (2017) thesis explores similar themes relating to students' intentions to persist and explores the interactions from the perspective of the student and their 'academic engagement'. Her study used two models of binary logistic regression to examine the relationships between college students' intention to persist (dependent variable) and the predictor (independent) variables of student-faculty interactions, learning strategies and collaborative learning. The data was longitudinal from 2,420 students. While the relationship between the variables and intention to persist was inconclusive in this study, she found that a supportive campus environment did have a positive relationship with students' intention to persist, complementing the ideas from Arshad-Snyder (2017) in relation to feeling known and valued.

Gabi and Sharpe's (2021) article from the English higher education context also seeks to position the student centrally in the research, focusing on student agency – and influencing their choice of the term 'persistence' rather than 'retention'. This mixed methods small-scale study across one institution used Exploratory Factor Analysis to enable consideration of the "fluid and complex factors that shape student persistence" (Gabi and Sharpe, 2021, 201). Their key findings reiterate the influence of student-tutor relationships; academic and social belonging; peer networks and learning communities. Recommendations from this research align with other themes reflecting the importance of the pedagogical design.

Chelberg and Bosman (2019) explore 'faculty mentoring' in the STEM context, with a focus on underrepresented groups. This small-scale qualitative study uses an experimental method in mentoring,

"asking students to document and share their lived experiences through photographs (eg photovoice). Then, photo-elicitation is used to further engage students in discussing what led to their subsequent empowerment in leveraging successes or overcoming barriers." (Chelberg and Bosman, 2019, 39)

While exploratory in nature, the findings were consistently positive in relation to the students' experience of the intervention and their attitudes and intentions relating to continued study. The nature of this kind of research offers an important addition to the literature, as much of the research on retention, persistence and related areas is conducted and collected without students participating and sharing their perspective, as the authors themselves note (Chelberg and Bosman, 2019, 45).

The focus of Johnson et al's (2020) longitudinal study is also STEM students, in a quasi-experimental small-scale research project (n=63, 116 and 118 students respectively, admitted in 2015, 2016 and 2017). The study explores the impact of a 'place-based learning community' on student persistence and equity gaps among minorities and disadvantaged groups. Notions of belonging are explicitly referenced in the study. The structure of the 'Klamath Connection place-based learning community' included a summer immersion, peer mentoring, a first-year seminar, and cohort blocked scheduling. The findings, aligned with others cited here, evidence that the learning community

"improved students' sense of belonging, academic performance, and first-year persistence, and it narrowed equity gaps in multiple measures. ...the deliberate attention to linking a sense of place to an interdisciplinary curriculum that transforms the first year experience may have general application to many other institutions, perhaps especially those that attract students to places unlike that of that their familial homes." (Johnson et al, 2020, 525)

A thesis from Smith (2016) explores the impact of a 'First Year Experience' (FYE) programme on the persistence of black male students in a predominantly white university. The programme consists of a 'summer bridge' residential (completion of which is mandatory for progression to enrolment), then a 'RSP' (research scholars programme) that provides support throughout the first year of a weekly meeting with an outreach counsellor, weekly structured study session (minimum required of 20 hours) and monthly scholarly community sessions. Findings showed a significant relationship between participation in the FYE programme and African American male persistence rates. Participants attributed success to the

“importance of mentorship relationships, understanding the benefit to making connections to key faculty and staff early on... and establishing a strong sense of community.”
(Smith, 2016, 116)

This aligns with the dominant themes of this literature review and builds on Webb et al's (2017) findings regarding persistence and retention. These themes are further supported by a German study from Meyer and Strauß (2019), exploring withdrawal rates for students in 'gender atypical fields of study'. While not an evaluation of an intervention, this study adds complementary evidence to the notion that faculty interactions and validation (via positive achievement) serve as positive influences on persistence and thus retention.

Another study focusing on STEM students in the US context is a systematic literature review from Smith and Van Aken (2020), that sought to identify the factors that most significantly affect engineering student persistence in their transfer from two-year to four-year institutions. From analysis of 76 publications, the authors found that increasing student integration and providing an inclusive institutional culture were significant – both of which align with the concepts of belonging and mattering.

In his mixed methods thesis, Snyder (2017) examines belonging specifically, exploring persistence among low-income students at one institution in the US. His survey had an 11.9% response rate (n=692 out of 5,791), of which 14 were interviewed in depth; the data was analysed using descriptive, multivariate and qualitative techniques. His findings support other research regarding the importance of financial aid – aligning with Webb et al's (2017) review – as well as the importance of students feeling that they belong and are valued as part of the institution.

Webb and Cotton (2018) explore early withdrawal in an English higher education context. From responses comprising approximately 10% of the survey population (n=1170), logistic regression was used to identify predictors with significant associations to 'contemplation of withdrawal'. Although not an analysis of an intervention, the centrality of the student voice in this report provides useful and supportive evidence to the thematic findings relating to the importance of 'faculty interaction' and learning communities.

The commonality between all the literature discussed in this section, whether explicitly referenced or not, reflects the concepts of 'belonging' (Strayhorn, 2018) and 'mattering' (Flett, 2018; Flett and Nepon, 2020) and suggests a relationship between these and student persistence and / or retention. Once again, this has significance for the design and delivery of the curricula. The implication is that building in opportunities to engender a sense of belonging in turn creates a learning community, cited in many of the studies above as influential, and which will be further explored in the next section.

Learning communities, curriculum, and pedagogical design

In the research discussed under the 'Faculty validation/interactions' theme above there are already multiple references to the creation of learning communities, both academics interacting with students, and students interacting with students. The role of pedagogical design in curating this environment will be discussed further in this section.

Ikuma et al (2019) present a longitudinal study with data collected over eight years from 3,097 students studying engineering at one institution who were engaged in a STEM 'Talent Expansion Programme'. This incorporated a residential college, a student mentoring programme, an introductory engineering design course and a summer bridge camp for first-year students. Using correlation analysis and multiple logistical regression techniques, the study found that the programme increased persistence (retention) by 11%, with particular significance for the residential, the mentoring and the introductory course. The study revealed that the residential and the course use active learning techniques to establish a learning community, which is complemented by the use of trained peer mentors who frequently return to the role (Ikuma et al, 2019, 68). In terms of the sustainability of large-scale but evidentially impactful programmes, industry funding had been sought from key engineering employers/corporate sponsors. Given the financial challenges facing higher education and the imperative to work closely with industry partners, this is an interesting development to note.

Loes et al (2017) look specifically at collaborative learning in a large longitudinal study (n=2987) across 19 institutions. Tinto's (1993) model is one of the theoretical bases for their work, which used logistic regression to estimate the influence of pre-existing collaborative learning (not an intervention evaluation) on enrolment into the second year of study. Their findings summarise that

"learning collaboratively leads to greater levels of positive peer interactions, which in turn is associated with greater odds of persisting to the 2nd year of college." (Loes et al, 2017, 62)

The researchers also found that exposure to collaborative learning and the impact on persistence (retention) affects students similarly regardless of student race, gender or academic ability. It can be extrapolated that the exposure to positive peer interactions helped to create a learning community, which in turn had a positive impact on retention for all students.

In a single institution study (n=237), Baier et al (2016) use multiple logistic regression analysis to explore whether student perceptions of self-efficacy, mentoring, academic achievement (grade point average) and demographic factors can be correlated to persistence. Although what was measured was intention to persist rather than retention, the research linked mentoring to learning communities, and found that both this and the perception of self-efficacy were the most significant factors in students' intentions to persist. Learning communities and mentoring comprised both peer-to-peer interactions and faculty-student interactions, complementing findings from other reports. A sense of self-efficacy can be developed via opportunities for positive engagement and achievement – which reflects the importance of early assessment opportunities, as discussed in the learner analytics theme (Bandura, 1986, see).

The positive impact of a learning community created by a drop-in support centre (DISC) intervention is evidenced by Martin et al (2018). In a context prescient of the one imposed by Covid-19, the research team were motivated by a reduction in on-campus time due to an increase in blended learning – as such their longitudinal study, based within nursing education in an Australian university, has current significance. The DISC provided an informal, learning space one day a week for students to access academic support; although a relatively small-scale study (n=163, with 13 students interviewed) the data demonstrated a positive effect on GPA (and by inference, retention), although the possibility of other influencing factors cannot be discounted. From the student perspective, the creation of and access to a 'learning community' with both staff and student support was cited as a key motivating factor for their continued engagement.

While not specifically referencing learning communities, the longitudinal (over six years) large-scale (n= 13,000) work of Millea et al (2018) frames student success (namely retention and graduation) as being a result of academic preparation, financial aid and smaller class sizes. Using regression models for analysis, they examined a comprehensive dataset from the university's database: students' admission records, demographics, ACT scores, financial aid, attendance and first-year experiences such as classes and grades. They recommended that institutions should "invest in smaller class sizes and focus on students' financial constraints to improve student success" (Millea et al, 2018, 320). Drawing on findings from similar studies, it is feasible to infer that smaller class sizes – or learning environments which create a sense of this – provide more opportunities for academic and peer interaction which enables the development of learning communities, which in turn supports student persistence and thus retention.

In a study that relates to the broader concept of belonging to a learning community, Simmons and Smith (2020) evaluate the impact of a specific peer coaching intervention with African-American and Latinx students in one US university. Their work is underpinned by Strayhorn's (2018) theoretical concepts of belonging and (implicitly) mattering, regarding students feeling valued and validated. Using a peer coaching model called 'Success Central' with 133 students, they analysed student satisfaction, perception of college experience and academic skills, and persistence (retention) data for the 90 students of colour within the survey population to ascertain impact. The results of their study exceeded their expectations, with 46% of the 'Success Central' students graduating within four years

compared to a 31% average across all students – the key contributing factors were that “having a dedicated peer trained in coaching techniques can strengthen a student’s sense of self-efficacy, sense of belonging... and persistence” (Simmons and Smith, 2020, 430).

Non-academic personal support

Several reports refer to non-academic interventions that provide a range of support to students, commonly (although not exclusively) relating to support for the costs associated with study. In the literature reviewed here and supporting the findings of the Webb et al (2017) review, such interventions were universally found to have a positive impact on persistence and / or retention, although causality is, as with other findings, difficult to categorically evidence.

Regarding financial support, an interesting report from Qayyum et al (2019) found that even where financial assistance was small-scale, this had a positive effect on the likelihood of persistence. This could link to notions of ‘mattering’ – if a student perceives that the institution ‘cares’ about them enough to support them with relatively small financial needs, this may impact their behaviours around persistence and, ultimately, on retention. More research and evidence are needed to explore whether there is a relationship between a student’s psychological connection and commitment to the university on the basis of the provision of non-academic personal support, and whether that ultimately impacts on their retention. Nevertheless, this way of framing the provision of financial support ties in with other findings relating to students feeling valued (Johnson et al, 2020; Smith and Van Aken, 2020). Conclusions that support the idea of a positive relationship between financial aid and retention are also found in Adamson’s (2016) thesis, while acknowledging the difficulty of extracting specific factors from the wide range of possible variables.

A small scale (n=90), single institution quasi-experimental study with a control group is the focus of Troester-Trate’s (2020) research exploring the relationship between the use of a non-academic services programme and retention. The programme included food, transportation and childcare services at no cost to enrolled students. Using ANOVA statistical tests, the survey findings complement those of Qayyum et al (2019) whereby the low-income students using the programme had equivalent rates of persistence and retention to students from higher income groups, when the norm is for these students to have lower rates. As such, “programs designed to address non-academic needs, are in fact effective at equalizing the chance of at-risk students being retained or persisting” (Troester-Trate, 2020, 618). Some of the themes from this report also relate to a Higher Education Policy Institute (HEPI) report on ‘commuter students’ (Maguire and Morris, 2018), in relation to consideration of transport costs and barriers for what is in the UK a significant proportion of ‘commuter’ university students (defined in various ways, but commonly as those students with the same home and term time address).

Referenced in the introduction to this section, and also reviewed in the Access section of this review due to its broader relevance, Wilson and Dauncey’s (2020) literature review from TASO ‘Gaps in the Student Experience’ was undertaken using a similar methodology to this IR, with an intended focus on

causal evidence (Type 2 and 3 data). Broadly, the literature supports bursaries as an effective method to alleviate financial disadvantage and thus mitigate the negative association between financial disadvantage and student success – complementing the findings of other reports included here. In terms of key interventions, other findings also complement themes within this report, in particular:

“Interventions that created social interactions and supported participation in learning activities and learning community engagement were generally effective in their outcome, and could be extrapolated as enhancing the students’ wellbeing... [and] personalised interventions, such as targeting supportive text messaging tailored to a student’s needs based on data analytics, was associated with significant improvements.” (Wilson and Dauncey, 2020, 20)

Such ‘personalised interventions’ add further weight to the concepts of ‘belonging’ and ‘mattering’ being significant in persistence and retention.

As outlined in the introduction, the research is not able to show conclusively that any higher retention is a direct causal result of participation in these interventions due to the complexity of factors. However, these findings and those referenced throughout this section add to a body of evidence that clearly indicates key areas for intervention to impact on retention.

Gaps in the retention literature

The literature reviewed is strongly reflective of the US model of college and university education. While valuable insights have been gained from this, it would be beneficial to see studies from a wider range of higher education contexts, and from a UK perspective, studies which reflect European and UK models of admission, finance and curriculum structures.

STEM disciplines are also perhaps over-represented in the literature – possibly because there continues to be an international emphasis in higher education policy on recruiting and retaining students into the STEM subjects. As such, it would be beneficial to see a wider range of disciplinary contexts represented, and indeed broader interdisciplinary studies where discipline is one variable.

The review of the retention literature prompts consideration of several areas where further research is needed. In common with other areas and previous reviews, there remains a need for high-quality evaluative data examining the impact of specific interventions designed to enhance retention, across multiple settings. Pilot studies and the use of comparison data from previous years can help with interpretation and correlation to the impact of interventions.

Some key areas where further research would enhance understanding and create valuable impact case studies are:

- + the impact of specific pedagogical interventions designed to create ‘learning communities’ and enhance student belonging on student persistence and retention

- + the impact of specific interventions designed to enhance 'faculty validation' and a sense of 'mattering' within students on student persistence and retention
- + the impact of early assessment opportunities and the related use of learner analytics on student persistence and retention.

Finally, it is worth commenting that many of the findings of this review, and others like it, are not particularly 'new' in relation to good practice (both pedagogical and institutional) that appears to have a positive impact on student experience and thus retention. Therefore, if we (the higher education sector) have already established at least some of what we need to do, why are we not doing it more consistently? What do we need to do to make good pedagogical practice and good institutional governance 'stick' (or 'sticky')? This is undoubtedly another area that would benefit from some targeted research to explore.

Methodological limitations

Rather than evaluating the impact of a specific intervention, 13 (out of 23, excluding the two that are literature reviews themselves) of the reviewed sources identify a range of variables (student characteristics, pre-existing institutional characteristics) and then conduct analysis to attempt to correlate differential retention outcomes (and/or student attitudes relating to persistence) with these variables. Authors acknowledge that there is difficulty in ascribing causality in this type of analysis and, as such, their findings and recommendations are framed tentatively. However, taken together as a body of work with similar findings, such studies do offer useful insights and indications of where further research may be best positioned.

Of the 10 studies that do evaluate the impact of an intervention, there are only five where that intervention is a new approach or idea, as opposed to a pre-existing programme with multiple features, again making identification of any causal impact of specific aspects challenging.

Most of the studies (16 out of 23) are located within one institution, mirroring the comments in other sections of this review about a lack of replication and evidence of transferability within the datasets. There is one source that is both an intervention and across multiple institutions (Kehoe, 2017), but the Dell Scholars programme is wide ranging in its support and, as such, identifying the impact of specific features remains problematic.

As with the Attainment and Progression sections, there are limitations in terms of how different interventions are, or could be, experienced by different groups of students.

Attainment

Summary headlines

- + The attainment area reviewed 67 pieces of literature; 50 were from the United States and five were from the UK, with the rest from Spain, Australia, Poland, Norway, Germany, Canada/North America, and Iran. Two studies were reviews of evidence researched within various locations.
- + Many interventions measured impact on attainment and retention outcomes in all the thematic areas and support the recommendation of a combined approach to exploring student success.
- + Approaches which use data/learning/learner analytics have been found to be effective in enhancing attainment, although more robust evidence is required.
- + Changes to structure, processes and policy within higher education are not benign. Student outcomes can be affected, although these outcomes are not the primary driver for change. Impact assessments of such changes need to be conducted and reported.
- + There is variability in the impact evidenced for financial aid, where the intervention is focused on reducing income inequity. Financial aid provided as part of a multi-intervention programme has been shown to be more successful in enhancing attainment outcomes.
- + The impact of technology-enabled learning on attainment outcomes is mixed; comparative studies of online/blended/hybrid contexts attempt to show that there is no negative impact rather than a positive impact and data is often supplemented by measures of student satisfaction. The relationship between engagement and outcomes in this area requires further exploration.
- + Pedagogical approaches which are based on student centred approaches, namely active learning, experiential learning, and peer supported learning are shown to impact positively on student attainment outcomes.
- + There is limited discussion of approaches to assessment in the literature.
- + A few studies discuss support for learning, through communities and access to resources. Specifically, the use of open access educational resources was explored and was found to be an equivalent, and less costly, approach than traditional textbook resources.
- + Interventions designed to provide student support are primarily focused on students defined/identified as 'at risk'. While a targeted approach is welcomed when evidence can support it, a deficit approach should be avoided.
- + Interventions which focus on supporting the psycho-social-behavioural aspects of student learning do show impact. Using the evidence from the effectiveness of data analytics could support intervention design.
- + Several support interventions were implemented early in the student journey, for example pre-entry or during the first year. Evidence of impact on academic readiness and success is apparent.
- + The impact of peer mentoring/tutoring has been evaluated. This approach to student support may be best used in combination with other activities.

- + There are known limitations of using grades/marks as the measure of attainment and this has skewed the included sources, excluding other measures of learning gain. There are also issues with associations which do not account for the mediating impact of high achievement (the counterfactual position that positive student outcome which may have occurred regardless of the intervention).
- + There is a positive skew in the evidence of impact of pedagogic interventions, and caution is advised relating to potential reporting and publication bias.

Context

The Webb et al (2017, 9) review defined attainment as “the extent to which students are enabled to fulfil their potential; sometimes discussed in terms of achieving a 2.1 or first class degree”. The current review searched for demonstrable impact on attainment and also acknowledged the importance of literature (especially teaching and learning approaches) which discusses achievement/performance (see Foster and Francis, 2020) in recognition of the intermediary steps needed to attain a degree outcome.

The Social Mobility Commission (2020, 11), in its evidence review for the FE sector,¹⁰ defines attainment as “education qualification (vocational or academic) or levels achieved” and achievement as “distance travelled or progress made”. In this review, this has been represented by evidenced changes in final grades/course grades/module grades/grade point average (GPA), rather than obtaining a predetermined learning outcome, on the assumption that demonstrated success is a good indication of degree outcome. This reflection has been equally apparent in the current review. Thus, the excluded evidence pertaining to learning outcomes is noted. Where the evidence discusses factors affecting attainment (such as individual characteristics), but has not provided evidence of a change, this has also been excluded, with any particular evidence which extends current understanding discussed as needed.

Webb et al (2017) also noted a lack of literature specifically on ‘good honours’, defined as first class honours or upper second class honours in the UK context, and this has also been found in the current analysis:

“Studies were more generally concerned with attainment in its widest sense of student learning – indicated through achievement of GPA throughout a programme, acquisition of credits, completion of degree, and rates of graduation. It would appear that interventions have been less focused on supporting students to achieve at a higher level than on student achievement per se, through completion of studies or otherwise.” (Webb et al, 2017, 68)

10 Providing aligned findings to this review, but the scope and age range is wider (1990+, 16+).

Thematic findings

In Webb et al (2017) attainment impact related to: structural and procedural interventions, namely finance and the use of data; teaching and learning interventions (which is the largest theme), focusing on student engagement and active learning, assessment and evaluation, class size and student-teacher relationship, and technology-enhanced learning; and supporting the curriculum, including study support and developmental programmes, and social and psychological interventions. This current review will build on this and report findings using the same thematic areas. After inclusion/exclusion criteria were applied, 70 pieces of literature were reviewed to produce these thematic findings. Sub-headings have been included due to the size of the evidence base.

There are several studies which measure attainment and retention outcomes together, combined into an overview of student success, although this approach does increase complexity in assessing impact on distinct variables.

Structural and procedural interventions

Administrative and environmental conditions

There are several studies that discussed administrative/environmental conditions within higher education institutions or the policy landscapes, where the overall aim was to evaluate the impact of imposed structures on student outcomes. The environmental conditions explored are varied and included the use of data analytics, scheduling/timetabling arrangements, course structures and teacher/instructor type. Several measures of attainment were used, often with the additional measure of degree completion.

In a systematic review of the use of learning analytics, Foster and Francis (2020) defined student outcomes criteria as retention, achievement/performance and, additionally, student engagement. In addition to critiquing the approaches used to measure and evidence impact, they found that:

“three quarters of studies report the use of educational data analytics to be effective in improving student outcomes but their relationship with student outcomes requires further and more robust investigation and assessment. We argue that research must interpret and communicate effectiveness qualitatively, as well as quantitatively, by including the student voice in assessments of impact.” (Foster and Francis, 2020, 822)

Warwick Economics and Development Ltd (2020) also found some evidence of impact when learner analytics was used to target underrepresented groups of students, and importantly noted the need to avoid reinforcing deficit assumptions or unintentionally widening gaps with such an approach. Wilson and Dauncey (2020) also discussed the possibilities apparent in the use of learning analytics, although the impact on outcomes is less clear.

In a small experimental review of scheduling/timetabling, Biggs et al (2018) used a variety of methods, including measures of grades and exam scores, to evaluate the impact of a continuity model of integrated clerkships for 29 student nurses. A change to the scheduling of the clinical experience was not found to have any impact on student outcomes although, using an alternative outcome measure, they conclude that it was preferred and had benefits for student-teacher relationships.

With a focus on course structure, Latino et al (2020) used a cumulative GPA and retention rates to explore the impact of accelerated learning (which enables high school students to earn college credits prior to graduation) and financial aid. They found that “accelerated learning reduced achievement gaps in first-year GPA and financial aid reduced achievement gaps in retention rates for Hispanic First Generation College Students” (Latino et al, 2020, 441). In a similar study focused on the structural conditions for obtaining an award, Silbert-Flagg et al (2018) deployed comparison groups of differing enrolment types – pre-licence enrolment and undergraduate course enrolment – for nursing students. They found no significant differences which led them to the conclusion that obtaining credit in non-traditional ways did not hinder final grades and overall attainment.

Xu and Solanki (2020) explored the impact of difference in teacher employment status (based on distinct academic positions) in their large quasi-experimental US study. They used administrative data from six student cohorts to examine the impact on student outcomes (current course grade, new course enrolment, subsequent course grade). They found no difference in impact on attainment but did observe a difference in subsequent enrolment in a similar course if the course was taken by academics who were defined as teaching faculty compared with research faculty.

Considering a policy lens, Hahm and Kluve (2019) explored the impact of the Bologna process that endeavoured to bring comparability in standards and quality of higher education qualification between European countries. This study’s particular focus was the impact on study duration and final grades for graduates over a 15-year period (n=24,675). They found that the Bologna process had “a significant, sizeable increase in the probability of graduating within planned instructional time” but had a negative impact on final grades (Hahm and Kluve, 2019, 425).

Financial support

A consistent theme within the discussion of structural and procedural interventions was financial support. Funding was detailed from various financial sponsors, including governmental and private funding, institutions and employers. In essence, these approaches seek to intervene to address the relationship between income inequity and educational attainment, using mainly experimental methods with large datasets from the United States, but often rely on historic data.

Some studies explore financial aid provided by employers or government-funded employment subsidies and cement the relationship between attainment and progression outcomes, especially rates of graduation. Tran and Smith (2017) comparatively analysed the impact of employer-sponsored educational assistance on retention and overall attainment outcomes, and note impact was more likely longer term (completion), than evidenced immediately after the intervention. Similarly, Scott-Clayton and Minaya (2016) focused on the Federal Work-Study programme and used data from a nationally representative sample of 30,545 US college entrants to conclude

“generally positive effects of Federal Work-Study participation on long-term outcomes, including a 3.2 percentage point impact on BA completion 6 years after enrolment, and a 2.4 percentage point impact on employment after six years for students who are not still enrolled.” (Scott-Clayton and Minaya, 2016, 16).

Similarly, Cheng et al (2019), published again as Cheng and Peterson (2021), evaluated the impact of a 1997 New York City school voucher intervention (which was a privately funded, lottery-based scholarship) on college attainment for 2,666 disadvantaged students (somewhat equivalent to free school meals eligibility in England). They measured access via enrolment and college attainment and found that vouchers had no overall impact on educational attainment rates but did positively impact graduation rates of students from minority and non-immigrant households. They conclude with further analysis of differential impact dependant on the extent of disadvantage; graduation rates were significantly lower for students in very low-income households, highlighting the role of social, economic and cultural capital as confounding variables.

There are studies which report on the financial assistance provided to existing students, supplementary to other financial benefits, which seek to address financial hardship, and are generally found to be effective. These studies are predominantly situated in the US context, but any comparable lessons have been extracted. Goldrick-Rab et al (2016), in their experimental study of three student cohorts in one US state, found that a lottery-based (due to number of applications), privately provided, means-tested, financial grant aid provided annually for up to five years of higher education (full-time study only), could improve bachelor's degree completion rates among students from low-income families. Liu (2017) found in four cohorts of 'degree-seeking' students, that additional funding through the year-round Pell Grant, introduced in 2010-11, increased degree attainment in short programmes, with other positive impacts noted on completion and progression to four-year degrees.

Nuanced changes in the conditions or applicability of financial aid to college contexts have also been researched; Mabel (2020) looked at the reduction in the lifetime eligibility condition, and found no evidence of impact on attainment, and Yang and Venezia (2020, 423) found “insignificant roles of Pell Grants and Federal Subsidized Loans, and negative role of Federal Unsubsidized Loans in associate degree attainment for rural community college students”, stating differences in the needs of rural students and insufficient aid provision of this kind. In an English study, the Office for Students (2020) measured the impact of financial support (aligned with Access and Participation Plans) on retention into second year, degree completion within five years, achieving a 'good' degree (first or 2:1), and a positive graduate outcome within six months. While this evidence has some limitations relating to

causality in the submission of evidence from HEIs and a small sample obtained (n=49), the OFS concluded that its 2017-2018 data showed that bursary recipients “performed the same or better than the comparison group” for at least one of these success outcomes (Office for Students, 2020, 5).

Financial interventions are also provided alongside complementary activities and packaged as a programme of support. Medsker et al (2016) used an experimental study to explore the Tech Valley Scholars Program, an intervention that combined student support (career seminars, mentoring) and scholarships for financial need, for impact on academic outcomes (persistence rates and final cumulative GPA). This programme, which had an overall aim for enhancing the STEM workforce, had significantly higher persistence rates and final cumulative GPAs than the established control groups. Miller et al’s (2020) experimental study found that three years of financial and student support provision nearly doubled graduation rates for low-income students. Page et al (2019, 684) also found that the Dell Scholars Program (financial aid and individual support) for low income and first-generation students led to “higher rates of bachelor’s degree completion within six years, as well improvements on multiple other measures of college success”. These studies show robust evidence for multi-intervention programmes, supporting the findings of Wilson and Dauncey (2020) who found that financial support was as an effective method to alleviate financial disadvantage and support student success, especially when combined with pastoral support.

Teaching, learning and assessment interventions

Most of the sources included in this review of the attainment evidence were themed within teaching, learning and assessment. Sub themes have been created which provide insights into technology-enabled learning, pedagogic approaches and learning support. As an overview source, Valentine et al (2021) explored a variety of high-impact pedagogies (HIP) for three cohorts of students 2017-2019. These included Study Abroad, Service Learning, Work-Based Learning, Learning Communities, Undergraduate Research, Certifications, Technology-Enhanced Learning (e-portfolios), First-Year Seminars, and Honours Education. Using existing institutional data on performance and HIP participation, they found positive results for those students who participated in HIP, especially the First-Year Experience and Undergraduate Research, and notably there were specific benefits for certain groups of students such as Black students. This review substantiates this evidence and presents a synopsis of this evidence below.

Technology-enabled learning

Comparing the effectiveness of online delivery and face to face delivery is complex due to variations in contextual and confounding variables. This is further complicated by the intricacies of differing modalities, or simply different definitions. Despite these issues, many authors have attempted a comparison, often seeking to provide evidence that online delivery does not impact negatively on attainment and supplementing attainment measures with evidence of student satisfaction. The evidence in this review suggests that online, blended and hybrid approaches to learning and teaching do not have a negative effect of student attainment outcomes. However, the evidence is

limited and there is no evidence that discusses the Covid context specifically. Similarly, TASO (2021) reviewed evidence to explore the effectiveness of online teaching and learning (including sources before the time range of this study, and most recently linked to the Covid-19 pandemic) and concluded that the evidence base is not yet robust enough to make a solid judgment.

Using a large, national, longitudinal sample, Carter (2019) studied the impact of online learning on attainment and degree completion and concluded that online learning results in similar levels of degree attainment compared to face to face or blended approaches. Similarly, in a study where students self-selected the 'teaching modality' (face-to-face, online, blended), and where assessment practices and instructors remained constant, Yen et al (2018) found that there was no significant difference in academic performance (grades) across the three modalities in an undergraduate child development course. Also, no significant differences were found in course satisfaction, however

"blended participants reported having the highest satisfaction with course Relevance ... The lowest rating for online modality students was Interactivity ... while the lowest rating for blended modality students was Peer Support." (Carter, 2019, 2148)

Importantly, they concluded that to ensure student success in any modality, face to face interaction and learning on demand were essential pedagogic elements. With a focus on the pedagogical activities employed within an online context, Francescucci and Rohani (2019), employed a quasi-experimental design for 698 students on an introduction to marketing course at a large urban US institution. They specifically explored the comparative effectiveness of "virtual, interactive, real-time, instructor-led (VIRI) online learning", describing VIRI as simulating an in-person experience by using techniques such as "break-out groups, white boarding, polling, and student-led presentations in Blackboard Collaborate" (Francescucci and Rohani, 2019, 60). Due to their perception of lack of consensus on the effectiveness of online learning, this was measured using student performance (grades) and engagement (a pre and post survey, based on National Survey of Student Engagement measures). They found no significant difference in student performance in mid and final grades where online and in person learning had the same outcomes. However, the online treatment group evidenced less engagement. In summary,

"This would suggest that the issue of student engagement and its impact on student performance continues to be unresolved... and may suggest further study of engagement factors between the F2F and the VIRI pedagogical approaches." (Francescucci and Rohani, 2019, 67)

Grønlien et al (2021) and Bernard et al (2017) used a very similar methodological approach and focused on the comparison between blended and face to face teaching strategies. Grønlien et al (2021) studied first year nursing students in Norway, using annual cohorts as the naturally occurring comparison of examination grades and course evaluations. They reported that students receiving blended learning performed better and reported higher satisfaction overall with the learning resources provided. Bernard et al (2017) also found a statistically significant increase in the students' outcomes (using five years of data) after chemistry classes were modernised to a blended format. In contrast, Chingos et al (2017) found that despite similar student attainment outcomes produced in a hybrid or

online MOOC (Massive Open Online Course) course format, students in the hybrid sections reported considerably lower satisfaction with their experience. They also found no evidence supporting the concern that disadvantaged or academically underprepared students were negatively affected by taking hybrid courses with reduced face to face class time.

To accompany the evidence on the comparative effectiveness of online, blended and hybrid learning, some studies specifically focused on 'flipped' learning. Definitions of a flipped approach vary, but consistently use a component of prior asynchronous access to online learning resources, or lecture capture and then synchronous discussion either face to face or online. The weight of evidence suggests that flipped approaches can impact positively on student attainment outcomes.

Two contrasting studies focused their evidence on the impact of lecture capture and supplement this with associated attendance measures. Dommeyer (2017) used a control group, various grade-based measures, and attendance data to explore impact. Their undergraduate marketing research lecture capture group, which had access to video recordings, had higher scores on all student performance variables and a lower absentee rate. In contrast, the UK study by Edwards and Clinton (2019) used a matched cohort (n=160/161 second year research methods students) to explore both lecture capture availability and lecture capture usage, mediated with attendance. Their overall conclusion was that the net effect of lecture capture on the cohort was generally negative. They concluded that

“Attendance (as a measure of student engagement), which predicts higher attainment (controlling for students’ previous grade and gender), mediates a negative relationship between lecture capture availability and attainment.” (Edwards and Clinton, 2019, 403)

Dunkle and Yantz (2021, 55) triangulated several sources to provide an in-depth exploration of a flipped approach where “lower-level Bloom taxonomy tasks” were moved “to out-of-class preparatory work”. While they had only researched one cohort at the time of publication, preliminary results showed significant improvements in student learning outcomes, persistence and attitudes to learning across various metrics of measurement. Motameni (2018) also explored the impact of adopting a ‘flipped classroom and collaborative-learning pedagogical scheme’ for 76 undergraduate marketing students (91 students in the control group). Although there are some methodological limitations (no random assignment) they found that students in the experimental group performed better on the final exam.

Finally, to supplement the discussion relating to learning analytics that appears in the retention theme, and as a structural/administrative process above, there is evidence which relates specifically to the use of the virtual learning environment (VLE), and the associated use of student data, where use of the VLE is a measure of student engagement. Serembus and Riccio (2019) explored student outcomes and student engagement in 360 MSc nursing students in the US, adopting Astin’s (1985) model of engagement, or specifically involvement. Involvement in the VLE was measured by interactions, minutes and submissions over a 10-week period. While this study does not describe an intervention as such, the engagement with the VLE was explored as an activity related to academic success (course grade). Supporting Astin’s model, the authors found that interactions and submissions had the highest impact on course grades.

Pedagogical approaches

Many of the pedagogical approaches found in the literature are grounded in the theoretical principles and activities of active and experiential learning which place the student as central in teaching and learning. The evidence presented below suggests that this pedagogical approach can have a positive impact on attainment.

Safari et al (2020), Bonem et al (2020), Sinnayah et al (2019) and Kiste et al (2017) synthesised findings from Warwick Economics and Development Ltd (2020), exploring new practices to address barriers to success for students from underrepresented groups. All learned that active learning was positively associated with attainment. Sinnayah et al (2019) compared a change in curriculum design in first-year paramedicine bioscience unit in an Australian HEI over several years (one non-intervention baseline and four intervention years, with no control group) using student grades and a student survey. During the intervention years, results showed that students obtained higher grades in the active learning that consisted of “small group-based, guided-inquiry learning, principally targeting student engagement with the curriculum”, and the survey data supported this assessment of effectiveness (Sinnayah et al, 2019, 239). In an approach described as ‘socially mediated active learning’, which integrates lab and lecture, with additional peer assistants and graduate student led studio sessions, Kiste et al (2017) measured the impact of a redesigned introductory chemistry course on 653 students over two annual cohorts in a large US university. They found that the integrated studio performance (average final exam grade) improved and found a positive shift in student learning attitudes, high overall satisfaction and student and instructor preference for the studio approach. As no control group was employed, time effects are a limitation, in addition to the unexplored impact of smaller class sizes in the studio experience.

Martinez-Rodrigo et al (2017) explored student-centred, problem-based learning in an economics course. While the intricacies of the approach are context specific, the authors did conclude that problem-based learning was effective by comparing grades before and after the approach was introduced. Similarly, Torrecilla et al (2021) explored a thinking-based approach in a chemical engineering course in a Spanish HEI. They aligned their approach with student-centred learning within six consecutive academic courses, ranging from 2013 to 2019, and compared to the previous four academic years. Building on principles of critical thinking and metacognition, this approach aimed to improve higher order cognitive skills through real-world problem-based and active learning. The research findings outlined the positive impact of this approach on academic performance (pass marks) compared to a more traditional teaching method.

Complementing the researched active learning and problem-based approaches were those defined as experiential. Smith and Gibbs (2020) studied the impact of a trading simulation within a business administration and economic course adopted in 2011-2017. Success was measured by using student grades and a calculated score of improvement of those that participated, and those that did not. Student self-selection does present some bias in these findings but the evidence showed that students who engaged in the experiential learning component attained higher overall grades and demonstrated substantially higher grade improvements. In addition, van Esch et al (2020) used

a quasi-experimental approach to assess the impact of an online marketing simulation.

They conclude that the simulation contributed to an increase in student's GPA but note the possible impact of associated variables, levels of overall engagement and required payment for participation, on this outcome.

Song et al (2017) also explored the impact of an experiential approach using service learning on academic outcomes (fourth-year cumulative GPA) and persistence (fourth-year cumulative units earned, retention and graduation). They researched a 2011 cohort of 5,368 underrepresented student groups: students of colour, students from low-income families and first-generation college attendees. No control or random selection was possible, so propensity score matching was applied to enhance robustness. Approximately half of the sample enrolled in at least one course that contained service learning during their first four college years. Using a theoretical foundation which assumes that this high-impact pedagogy may significantly influence outcomes of underrepresented students, drawing on Bean (1980, 1983), Astin (1993) and Tinto (1993), they found that engagement in community-based service learning positively impacted academic performance and persistence. Differences in retention and graduation rates suggest that the benefits of service learning for underrepresented students are complex and mediated by social, economic and cultural capital. Marts (2016) also investigated a service learning approach at a multi-campus community college in the US. Their experimental design concluded that student outcomes (college credits obtained, average first-term and final grade point averages) were better for those students who had participated in this pedagogic approach.

There are a several studies which evidence the positive impact of an undergraduate research experience on mid point and end point attainment outcomes. In a longitudinal study with 48 participants, Ing et al (2021) collected data on the first-year retention rates and course grades to explore course-based undergraduate research experience using a randomised design (research experience or traditional lab experience groups). Students who experienced the undergraduate research experience had significantly higher overall grades in the related course (noting statistical adjustment for demographic and academic characteristics). While the research context is specific to STEM and a Hispanic-serving institution, the findings are substantiated by other sources. Collins et al (2017) used five years of institutional data (n= 1,739) to conclude that undergraduate research participation predicted higher GPA. While Bowman and Holmes (2018) found that first-year research participation is significantly and positively related to first-year university satisfaction and fourth-year undergraduate GPA, and it is unrelated to satisfaction and grades in other years as well as graduate degree intentions.

In one additional example of the impact of learning experiences, Bell and Glass (2019) explored the impact of study abroad experiences to assess whether they created an undue burden on Pell-eligible students from low-income households, measured by impact on overall GPA and time to completion. The complex impact of such experiences on students is an important consideration as study abroad is encouraged in the US HE context. The authors concluded that study abroad "did not create an undue burden that impeded the success of students from low-income households" (Bell and Glass, 2019, 180).

The impact of peer-supported teaching, learning and assessment was also evidenced in several sources. Safari et al (2020) implemented a quasi-experimental study in Iran exploring the impact of peer teaching in a small sample of 32 medical students, measured by a post test, mid point and final exam and a survey of student perceptions. Supporting the previous synthesis, peer teaching was grounded in the theoretical underpinnings of active learning, and specifically Toppings' (1988 in Safari et al, 2020, 292) peer and socio-cultural theories of learning. All students experienced both tutor/lecture focused teaching and peer teaching during a single course. The authors found that average exam grades and post-test scores for peer teaching were significantly greater than corresponding scores for the comparative approach. The results are attributed to the pedagogic approach, rather than who delivered it. However, interestingly, the tutor-led approach was viewed as preferable by the student cohorts.

With a specific focus on an online context, Liu et al (2019) explored the achievement of learning outcomes and feedback engagement/self regulation of learning in a comparative study of voluntary or compulsory peer assessment and feedback components. This research investigated a graduate level online course, employing propensity score matching to strengthen causal arguments. Using various measures, the authors conclude that the voluntary peer assessment was more effective, although both peer assessment formats could improve marks. They discussed the need to enhance engagement and participation in peer assessment via strategies such as gamification. The authors suggest that this is a useful study for future online delivery; the online environment can support student engagement in peer assessment through processes of anonymity, using either a formative or summative approach.

There were very few sources, in addition to Liu et al (2019), which discussed assessment strategies. In a further UK-based study, Pitt and Winstone (2018) explored the impact of anonymous marking for 442 students across four subject areas. They used individual assessment data of summative coursework which was marked anonymously (one module) and non-anonymously (three modules) with a supplementary post-test survey. Although the research design triangulates data from more than one subject area, causal inferences are limited. Given the paucity of evidence relating to assessment, and their focus on the possible differential impact on student groups (gender and ethnicity bias) this has been included. They conclude

“Students’ performance did not differ significantly across coursework that was marked anonymously and non-anonymously ... Crucially, none of the interactions including the factor of anonymity were statistically significant ... thus, anonymous marking did not seem to advantage or disadvantage particular groups of student.” (Pitt and Winstone, 2018, 1188)

However, supporting the recent and continued sector-wide analysis of degree awarding gaps, they found that “regardless of whether work was marked anonymously or non-anonymously, white students obtained higher grades than black students” (Pitt and Winstone, 2018, 1188).

Learning support

Holt and Nielson (2019) expanded attainment and retention data by using student performance, attendance, final grade, improvement, completion rates and failure rates to measure the impact of linked learning communities as a specific learning and teaching approach. In contrast to some US learning environments, this study explores a non-residential, commuter context. Drawing on the work of Tinto to discuss learning communities as a high impact pedagogy, this study aimed to explore the integration of the academic and the social within student learning. This quasi-experimental study used matched sections of 'linked learning', where courses with common goals are brought together and students are "self-selected into learning community (or non-learning community) classes, primarily based on recommendations from academic advisors" (Holt and Nielson, 2019, 673). Ten pairs of courses with a range of disciplines were explored (n=869, and 25% were in a linked learning community). Extensive triangulated data found no significant difference in performance (final grade, but also improvement and failure rates) or levels of engagement and the authors were confident that the students did not differ significantly by background characteristics. Conversely, Evans et al (2016) explored the impact of online social networks (a bespoke college app, aligned to Facebook), also building on Tinto (1993) and influenced by other research on a US two-year community college context that found that an integrated approach to social and academic interactions reported the greatest impact. A series of "socio academic integrative moments" were explored by qualitative analysis of coded text (N = 8,749), alongside other quantitative outcomes variables (N = 27,040) (Evans et al, 2016, 235). While their analysis is not causal (based on multiple and logistic regression) and there was low overall app usage in the population, they found that "participation in socio-academic exchange on the network is positively related to students' GPAs during their first semester of network use" (Evans et al, 2016, 232). This supports the findings of Wilson and Dauncey (2020) who also found a lack of conclusive evidence on the impact of social interaction and learning communities.

There is some discussion, primarily in North America, of the financial costs of accessing learning resources. To this end, the impact of open access educational resources (OER) has been explored, and no negative impact of using open access sources has been found. Grewe and Davis (2017) compared academic performance in an introductory history online course with 146 students who accessed OER and traditional textbooks. Data was gleaned from institutional records, and while there was no control group, this comparison did evidence that students using the OER sections of the course performed as well or better than students using sections that used commercial textbooks. Similarly, Jhangiani et al (2018) implemented a quasi-experimental research design in a Canadian institution to explore the impact of textbook access on four groups of students on an introduction to psychology course. They found that students assigned an open textbook performed the same or better than those assigned a commercial textbook. Students also perceived open resources to be of better quality. Medley-Rath (2018) also employed a quasi-experimental design with a small sample of 47 students, which explored the impact of online or printed resources. They found no significant relationship between type of reading materials on pre/post test improvement or final grades. These studies indicate that resource-based cost savings for students could be made without a detrimental impact in attainment.

Supporting the curriculum

Psycho-social or behavioural theories

The final theme in the attainment section discusses the use of interventions premised on psycho-social or behavioural theories of student experiences which tend to focus on students defined as 'at-risk'. In an English study, Deighton et al (2019) evaluated the impact of a supportive text messaging intervention for 358 students, modelled on levels of emotional intelligence and embedded within the curriculum. They found that the text messaging service, aside from the levels of emotional intelligence, did have an impact on progression rates, mean grades, attendance and online engagement. In a similar US study, Cannon (2016) measured the impact of 'nudge' text messages encouraging social support on quarterly GPA and subsequent semester retention for 585 first-year students. While they found no impact on these measures, they did report greater engagement with intermediate, behavioural and goal-orientated measures in their theory of change. This study did report impact by student sub-groups but did report a larger impact on Pell-eligible (means-tested financial aid) and underrepresented minority students, encouraging the use of this approach for at-risk students. This evidence suggests that there may be some utility in combining the approach to identifying at-risk students via data analytics with this intervention, for positive impact.

With a similar focus on 'at-risk students', Solanki et al (2020) conducted a meta-analysis of 41 college-level randomised interventions to explore the impact of social-psychological interventions on academic outcomes. Overall, they found that students in the treatment group (interventions focusing on growth mindset, belonging, values affirmation) outperformed the control group using various measures (course grades, GPA, competency tests etc). They noted the limitations of focusing on success outcome measures, and the utility of exploring future career trajectories.

Transition and induction

Some of these studies describe and show positive impact of interventions which focus specifically on transition and induction into higher education, which are generally available to at-risk student groups. Some interventions were implemented pre-entry or early in the student journey and aimed to impact on attainment outcomes in the first year and/or beyond. Some college readiness programmes also measured impact on attainment, but only some are relevant beyond the US context. These approaches aim to ensure that student success beyond access to HE is evidenced and highlight the holistic approach to intervention design and evaluation. For example, Sanchez et al (2018) used institutional GPA and persistence data to explore the impact of the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), which aimed to address disparities in college knowledge for underrepresented student groups while still in public school (also referenced in the access section). This programme provided preparatory information, tutoring, mentoring and assistance in admissions processes. Data showed that GEAR UP students were as successful in attainment and retention as their peers.

Collings and Eaton (2021) evidenced the positive impact of a six-week, transition-focused study support intervention (two-hour weekly sessions, minimal distraction, peer facilitation, focus on goal setting activities) delivered in the first semester in a US institution on both first year GPA and retention (replicated for subsequent years). Although this was not an experimental study, before and after measures were implemented for the small sample of 45 students. They found that this intervention did have a positive impact on student outcomes.

Karp et al (2017) explored the impact of a first-year seminar (a student success course) that integrated college orientation activities, disciplinary content and academic skills. The majority of students in this study were from minoritised ethnicities and low-income household backgrounds. Using a matched comparison group, they found that the intervention group obtained a higher GPA after the first semester, earned more credits than the control group and sustained these outcomes over time. Triangulated qualitative data cemented the importance of the student-centred pedagogy with applied and contextual learning delivered by experienced facilitators. Gordanier et al (2019) also explored the effectiveness of an intervention delivered in the first few weeks of an Economics course. The university's Student Success Center provided additional academic support (tutoring and study skills development) to 640 students in one US HEI. The dataset was analysed to show an increase in performance on final exam score, highlighting the impact of a relatively low cost, early intervention on student attainment.

While these studies focused on quantitative measurement, Lane (2016) employed a triangulated qualitative case study (including 42 current and previous participants) and explored how a STEM enrichment programme, which aimed to support first-year students with the transition to academic culture and college life, supported retention and degree attainment of students of colour in a large US HEI. The programme was comprehensive and included, among other aspects, a summer bridge programme, peer mentoring, academic advising and an undergraduate research experience. All participants also shared residential space. While they did not record quantitative student outcome data, they did report impact on support for educational, financial, vocational and psycho-social support, community building and STEM identity development.

Academic support

The provision of academic support has also been analysed for impact on attainment outcomes. Gaha et al (2018) explored the impact of library instruction sessions over a two-year period for 1,380 students and correlated four-year cumulative GPA with courses with at least one library instruction session. The authors noted the inaccuracies in using GPA as a proxy measure of student success but highlighted the ease of data analysis for professional services areas without a direct relationship to evidence of student learning. They also noted limitations in secondary data which means that offering a course did not mean the students subsequently attended. Russell et al (2018) also evidenced higher grades after a library-led digital literacy skills module intervention for 802 nursing students.

Balzer Carr and London (2019) investigated the impact of supplemental instruction and tutoring on course grades (and additionally retention and completion data) over four years for 2,452 students at the University of California, Santa Cruz campus (a Hispanic-serving institution) with the highest levels of academic risk. Students who participated in modified supplemental instruction and tutoring, which was attached to a course, open to all enrolled students, peer guided and interactive, obtained comparatively higher course grades. Using supplemental instruction was also more likely to impact positively on grades than tutoring.

Peers in tutoring and mentoring

The use of peers in tutoring and mentoring, as stand-alone interventions (rather than as a pedagogic approach), is also a theme in the literature. In addition to other studies in this section (Balzer Carr and London, 2019; Collings and Eaton, 2021; Lane, 2016), Hillier et al (2019) examined outcomes of engagement in a student to student mentoring programme for students with a registered disability (various courses) measured by GPA, average number of credits earned and retention. No impact on academic outcomes was observed. However, a change was seen in knowledge, skills and behaviours (for example, knowing university processes, how to meet people on campus, and how to access support). A one-year follow-up identified sustained impact on knowledge, skills and behaviours over time. Rennar-Potacco et al (2019) also measured the impact of academic support through synchronous virtual meetings (compared to face to face) provided by current or former STEM student at the institution by analysing grade and retention outcomes. This quasi-experimental design concluded that there were differences in final grades with online tutoring obtaining higher grades than face to face or no tutoring although this difference was not significant. These examples suggested that peer mentoring/tutoring can be successful on intermediate student outcomes, when combined with other support activities or provided early in the student journey. Wilson and Dauncey (2020) also found mentoring, guidance and counselling to be an effective method of increasing retention and attainment rates.

Gaps in the evidence base

There were two areas which did not feature heavily in this evidence base: assessment practices and student engagement. Assessment practices did appear in earlier phases of this review (assessment briefing, rubrics, marking practices) but were excluded due to weak evidence of impact (confounding variables), methods adopted (self-reporting of achievement) and contextual impact on learning outcomes (eg surgical operating skills, collaborative learning skills and problem solving) which was not measured as attainment. Similar conclusions can be made regarding the exploration of student engagement. While this was measured in various ways (eg attendance, VLE use and self reported scales), and often as a mediating variable (intervention increases engagement which then increases attainment) evidence of engaging students as partners/co-producers/co-creators/change agents was not apparent.

Methodological limitations

While it was necessary to impose restrictions through the definition of attainment, there are notable limitations when focusing on student grades. Caspersen and Smeby (2018), drawing on their previous work and that of Yorke, remind us that

“Grades are difficult to compare among institutions, as standards tend to vary among institutions (and programmes). Moreover, grades measure only (or at least mainly) theoretical mastery, not practical competence; grades are argued to signal only students’ general ability to succeed in higher education.” (Caspersen and Smeby, 2018, 118)

Furthermore, grades “may not always capture students’ authentic learning abilities” (Francescucci and Rohani, 2019, 61). Grade-based studies encompassed module grades/final grades/cumulative grades and few studies discussed degree attainment, and specifically good honours (probably due to the US skew). Excluded sources tended to evidence impact on learning, for example, as specific test of learning or observation of learning outcomes. These studies, with others, were on the edge on inclusion in this theme. Often Type 2 (pre and post testing) or Type 3 (inclusion of a control group) evidence was gathered, but the outcome measure was a specific learning outcome and too contextual to be of use. There were 83 sources of evidence on the edge of inclusion and most of these sources could be themed within the teaching and learning interventions section. Many of the pertinent approaches above were apparent (eg active learning, student-centred learning, technology-enabled learning). Examples include: the use of audio-visual tools to teach dissection in human anatomy (Choi-Lundberg et al, 2016), where multiple cohorts were studied, but data related to a specific examination or measures of usage of various learning resources; and outcome-based course design using concept mapping for nursing students (Hsu et al, 2016) with impact assessed by measuring change in validated survey scales. Due to the inclusion/exclusion criteria applied during this review, there may be gaps in the effectiveness of specific pedagogical approaches. Recommendations for how to develop evidence beyond learning outcomes, and as evidence of attainment (from medium term, intermediary outcomes) should be developed.

There is also a plethora of literature on structural, contextual (sometimes individual) factors which affect attainment (coupled with retention) in higher education, highlighted by Webb et al (2017) and going back to Hattie’s (2008) extensive review. Studies which only provided useful context (structural inequality, prior attainment, social-cultural-economic capital etc), but did not provide evidence of what can be done to address issues or narrow gaps, were excluded. The lack of studies in this review which target interventions on student groups may be indicative of a tendency to discuss wicked issues without providing pathways to action and impact.

Several of the included sources which discussed pedagogical approaches made comparisons in academic performance and supplemented the discussion with measures of student satisfaction (bespoke, survey based). Mixed findings were reported, while Warwick Economics and Development Ltd (2020) notes that initial satisfaction may decrease after a new intervention. This research strategy can provide supplementary evidence for sponsors, funders and practitioners that interventions are

well liked by students or are contributing to aspects of learning gain (knowledge, skills or behaviours) even if they are not yet showing evidence of impact on outcomes. This data was often gathered concurrently, whereas longitudinal data gathering may be of more use.

However, some caution should be applied when assessing the impact of pedagogic research, as noted by several of the included authors. Grønlien et al (2021) note a potential bias in data relating to student performance; that the pedagogic approaches tested may be benefiting students who are already performing well. Edwards and Clinton (2019, 418) also conclude that “lecture capture usage itself will not necessarily help students increase their grades; students who are generally higher achievers who attend lectures are likely to get better grades regardless of their lecture capture usage”. Liu et al (2019) also note that those who self-selected their voluntary peer assessment intervention may already be high achievers with higher levels of motivation. Only some studies controlled for associated dependant variables and these tended to use large datasets and not those that evaluated the impact of smaller, discrete pedagogic approaches.

Finally, it is apparent that most studies relating to pedagogic interventions report positive student outcomes. Questions about the reliability of the sample, unrelated to the integrative review methodology but linked to potential reporting and publication bias in higher education learning and teaching research, the influence of learning and teaching funding and methodological features of learning and teaching research. Recommendations for the exploration of failures and lessons learnt, in addition to good practice, will be incorporated.

Progression

Summary headlines

- + The progression area focused on evidence of progression to employment or further study from 24 sources of literature; 12 are from the United States, six from UK (three Scotland) and the rest from Korea, South Africa, Iran, Switzerland, Turkey and one review which used sources from various locations.
- + Few interventions were found to fit exclusively into the presented themes, highlighting the multi-faceted approaches used in this space. Similarly, these interventions explore impact on a range of access, retention and attainment measures, and rarely progression alone.
- + Career-based interventions do explore impact on access, retention and attainment, often with intermediate or alternative outcomes such as the development of personal skills or career aspirations, but do not provide robust evidence of their impact on employment or further study. Only one career-based intervention with a small sample provided evidence of the impact on employment, while other studies expressed their desire for future longitudinal exploration.
- + The development of employability skills and professional competencies is supported within the curriculum. Impact is measured specific to the local context but does not provide robust evidence of their impact on employment or further study.
- + Placements and professional experience interventions were more likely to report on longer-term employment outcomes and the collated evidence shows that work placements, sandwich placements and internships can have a positive experience on student progression outcomes.
- + Limited conclusions can be generated on the impact of this evidence on employment or further study. Practitioners and researchers should logically model and then measure the associations between intermediate and longer-term progression outcomes.
- + There are some evidence caveats namely; a disciplinary skew, limited intervention replication and lack of depth in the exploration of differential impact on specific student groups.

Context

The Webb et al (2017, 4) review defined progression as the “successful transitions within the programme of study and afterwards (to employment or further study)” and this guided the application of search terms. The dominant indicator in this evidence base is impact on progression outcomes after graduation, although interventions which aid related progression outcomes within the programme of study are also included if suitably aligned.

The evidence presented within the retention and attainment sections also provides a fuller discussion of transition strategies within a programme of study. Boundaries are blurred between access into HE at postgraduate levels and progression to further study which has been acknowledged as necessary throughout.

Thematic findings

In the Webb et al (2017) review, progression impact related to **careers service provision; progression within the curriculum; progression into specific pathways; and placements and professional experiences**. This current review supports and builds on this and themes the progression evidence as: **career-based interventions (career service provision, other central services provision, external provision); placements and professional experiences; and progression within the curriculum**. Twenty-four studies have been included and thematically reviewed for this report. The findings should be read in conjunction with the Advance HE Employability Review (Advance HE, 2021).

While it may appear that themes are mutually exclusive, many of the examples below cut across multiple themes due to the design of the intervention or measures of impact. For example, the Lakeland (2019) case study includes multiple interventions spanning work experience, careers interventions and mentoring, and Martinson et al (2018) evaluated a large training programme that had elements of career interventions, work-based learning and basic skills development. Few interventions fit exclusively into these presented themes, highlighting the multi-faceted approaches used in this space. Similarly, these interventions explore impact on a range of access, retention and attainment measures, and rarely progression alone. For example, Wilson and Dauncey (2020) collated provider evidence of the impact of extra-curricular activity at all levels of study. They reference the longitudinal analysis of impact at Nottingham Trent University which found that participation in extra-curricular activities increased attainment in all years of study. The known association between attainment and progression outcomes is used in this case study to predict the association between extra-curricular activity and progression outcomes. These examples emphasise that the importance of a holistic approach to intervention design across the student lifecycle should be recognised at the outset.

Career-based interventions

It would be wrong to assume that career-based interventions always measure the impact on employment gains. Davies et al (2020) explored student transition and the role of career services in five Scottish HEIs, post-graduation. Their hypothesis was

“If more unemployed/underemployed graduates receive appropriate employability support after graduation this should improve their chances of obtaining graduate level outcomes as well as helping them to feel supported and valued by their institutions.” (Davies et al, 2020, 1)

A graduate support MOOC was developed following research with students. Davies et al (2020) provides a good example of identifying a need, creating a solution from the evidence, and testing it with students. While the interim framework produced by this project team provides a useful overview for design, data collection and evaluation of employability support led by careers services, the impact on graduate outcomes is missing.

The evidence presented here covers all levels of higher education suggesting that career-based interventions are applicable at all stages of the student lifecycle. Several studies focused evidence on early interventions (pre-HE or years 1 and 2). These programmes measured the impact on career aspirations and mindset, often with a specific career focus. The focus of summer bridging programmes in the US is on underrepresented and disadvantaged target groups. Kitchen et al (2018) conducted a large-scale analysis of the impact of a STEM summer bridging programmes (n=383). This intervention took place before entry to higher education but presumed impact on eventual career attainment in addition to access, attainment and retention in the short term. The aim of these programmes was to raise aspirations through academic, social and professional aspects. Across a range of demographics, they found that that participation in the STEM summer programme doubled the possibility of a STEM career plan for participants.

Similarly, Martinson et al (2018) evaluated the implementation and impact of a programme for students enrolled in basic skills and training programmes at three Washington state colleges (community/technical) using randomly assigned treatment (n=315) and control groups (n=317). The aim of this national career pathway programme was to increase access to and completion of college-level occupational training for high demand careers, focusing on students whose college test score was too low for direct enrolment onto a college level course. This study

“increased participation in college level courses, number of credits earned and credential attainment. Future reports will examine whether the I-BEST program resulted in gains in employment and earnings.” (Martinson et al, 2018, 0-i)

Clayton et al (2019) used comparison groups (participants/non-participants) to evidence the impact of the KEY Careers programme at one large HEI in the United States. The aim of this programme was to enable first-year students, through voluntary participation, to gain clarity in their career deliberations and make informed choices about further study (major) and vocation. It includes personal assessment of career clarity (before and after survey), online learning experience, and on campus activities (group workshops, individual mentoring). Designed as part of an institutional drive to enhance retention and progression, this study found that the outcome of participation in the careers programme was a statistically significant increase in one-year retention and four-year graduation rates.

The authors also discuss the benefits of building on this dataset with longitudinal evidence of longer-term impact on student careers. Both Clayton et al (2019) and Martinson et al (2018) highlighted the benefits of future longitudinal reporting of employment and wage gains, emphasising the holistic and short-term impact of careers programmes, alongside the gap in evidencing longer term impact on progression to employments or further study.

Kezar et al (2020) also used a mixed method approach, longitudinal survey data, pre and post testing of randomised comparison groups (n=273) with qualitative follow ups to evaluate the impact of a comprehensive college transition programme on career self-efficacy (students' confidence in their major/degree and career paths). They defined career self-efficacy as an intermediary outcome for long-term retention outcomes. This intervention was specifically targeted at low-income, first-generation and underrepresented minority students. The theory of change asserts that students are

most likely to be retained if they are secure in their assessment of career outcome and major. This study found that participation sustained or promoted career self-efficacy, explained by the role of individualised support by staff career advisors.

Lavallais's (2017) quasi-experimental study targeted 100 at-risk undergraduate African-American males, at all levels of study, supplemented by 75 recent alumni. The intervention delivered three two-hour workshops and 1.5 hours of monthly coaching sessions with faculty staff over a seven-month period to support career planning. These interventions focused on skills identification and internship/career awareness raising (exposure) while the coaching sessions aimed to provide support for personal issues and life challenges. Like previous studies mentioned, Lavallais (2017), measured the outcomes on more than one aspect of the student lifecycle. Firstly, measuring levels of persistence (retention) and secondly, exploring job placement and graduate study with programme alumni four to six years after their mentoring engagement. Mentoring was valued by both treatment and control groups and an impact on persistence was evidenced. The follow up alumni survey evidenced a correlation between mentorship and being the best candidate in a pool for employment or further study.

In a slightly older single group experimental study, Yilmaz et al (2016) measured the impact of a career planning event on the career plans for nursing students (n=105) in Turkey using a pre and post questionnaire. A positive impact was reported in both perceptions of professional qualities and professional status. This is very similar to the causal evaluation of Jung and Yoo (2020), who found that a career efficacy enhancement programme that worked with 69 second-year Korean nursing students improved the participants' career decision skills, identities, preparation behaviour and efficacy immediately after and five months post intervention. Jung and Yoo's (2020) evidence-informed programme included workbooks, videos and workshop sessions. Both Yilmaz et al (2016) and Jung and Yoo's (2020) career-based interventions were linked to the nursing profession and personal development but there was no reported impact on progression outcomes.

Finally, Villachica et al (2020) formatively evaluated the impact of a foundations of professional development course (online, master's-level, US), described as a career coaching intervention. This course included aspects of job searching, career development planning, CV and interview skills and aimed to improve professional readiness and build self-confidence. In addition, they explored to what extent career coaching contributed to participants' current job situation. Longitudinal evidence from a small cohort (n=19) over four semesters indicated that participants consistently self-reported increased levels of confidence after career coaching compared to pre-intervention reporting. During the last phase of data collection, almost half of the participants had obtained a job and attributed between 42% and 60% of their current job situation to the career coaching course.

Progression within the curriculum

It is important to recognise the role of curriculum design and pedagogy in progression outcomes, although the evidence base for assumptions of demonstrable impact are limited. In contrast to interventions provided by adjunct services, these initiatives are based within teaching and learning and often focus primarily on skills development, rather than progression outcomes. The assumption

made, mirroring the discussion in the previous theme, is that the development of employability skills is an intermediate outcome, associated with longer-term employment successes.

In one exception, Frantz et al (2017) were able to combine an experimental design with data from alumni, although this data was not collected in a systematic way (via known contacts and social media). They explored the differential impact on career outcomes of course-based undergraduate research experiences as an alternative to the traditional, mentored apprenticeship where the student aligns with an established researching academic. The resource implications of each model are discussed with course-based approaches (a collaborative learning model). The data was collected from 2009 to 2011 with approximately 40 randomly assigned undergraduate students in each cohort (n=155) selected by application from across the US. In addition to measuring change in behaviours and skills (eg self-efficacy, teamwork), this evaluation tracked alumni four to seven years after participation in the summer programme. They conclude:

“both program models produce similar short-term positive outcomes for students, in the form of enhancing internal dispositions predictive of retention in research. In addition, more than 90% of known program alumni remain in science career paths 4–7 years after program participation, with 47% in research tracks specifically, and again no differences across program model.” (Frantz et al, 2017, 8)

Their conclusion suggests that course-based undergraduate research experiences (URE) are less resource intensive and have the same outcomes and should be considered in light of the impact on progression into research careers. This is supported by Cooper et al (2019) whose quasi-experimental comparison based on differential impact of undergraduate research experience (n=3,215), found that scholarship programme students who completed the URE were 2.2 times more likely to attain an advanced degree. There is evidence that gaining research experience is valuable for attainment with a course and progression into careers and further study.

Although the measurement of success was on skill rather than career path, Mancini et al (2019) found similar results from changes to a pedagogic approach. The use of simulations is a common theme in the progression within the curriculum evidence base. Mancini et al (2019) found no significant difference on clinical competency when redistributing clinical hours (up to 50%) from a clinical site to a simulation. This is complemented by Ward et al (2016) who found that online and face to face simulation activity had equivalent student satisfaction and outcomes (n=186, undergraduate psychology students) and both approaches scored highly, but not significantly differently in measures of entrepreneurial awareness. This is supported by Pedersen et al (2021) who found that a more positive interprofessional attitude was evidenced directly after a hybrid simulation intervention for obstetric emergencies (nursing students). These studies suggest that progression aligned teaching and learning approaches, particularly simulations, can be redesigned and evaluated to evidence comparable outcomes. This is a particularly pertinent point which relates to adapted learning during the Covid-19 pandemic and beyond.

Further evidence is indicative of the approach of Dinning and Ünlü (2017); local, small scale, skills based and lacking long-term outcomes. They discussed a project in one school (sport) in one UK HEI which focused on the impact of embedding employability and enterprise skills in the curriculum, working closely with a local employer (sports club) for eight weeks, accounting for 75 hours of work per student (n=30/22). A mixed methods approach with pre and post questionnaires and interviews was delivered (with students and project hosts). The findings concluded that the project-based learning did develop employability and enterprise skills. An interesting mismatch in the data showed that students' and hosts' perceptions of skills differed, and students had a higher opinion of their skill levels than was evidenced. The relationship between course and employer in the development of skills is therefore key.

There are also studies that discussed the development of skills and competencies within courses which would enable future retention and success and within employment. For example, Karimi et al (2016) delivered a quasi-experimental pre-test–post-test control group design (n=68 undergraduates of agricultural science) to explore changes in divergent thinking ability (necessary for business development and problem solving) and business idea generation in two modules, one which had been redesigned to focus on ideas generation and student creativity. The study ran for approximately four months in one HEI in Iran. The results suggested that students' divergent thinking increased significantly after the redesigned course. The authors also noted the lack of longitudinal effects as a limitation of the research. In addition, Jay and Owen (2016) used a longitudinal design with a sample (two-year comparison) of second-year BSc occupational therapy students in one South African HEI to explore skill proficiency and opportunities for self-evaluation within clinical fieldwork. The adoption of problem-based learning with a focus on deliberate learning and feedback aimed to support transition into clinical settings. Student marks and tutor reflections were used as evidence, and performance improved when students were given support in self-evaluation.

Finally, Osborn et al (2020) updated earlier studies of the effectiveness of credit-based career development courses designed using cognitive information processing for undergraduate students in the US by comparing pre and post measures to a matched academic course (human resources). They found that the career development course had more effect on career decision state, cognitive information processing skills, career decision-making stage, knowledge of next steps, and anxiety about current career concern. Mirroring the findings of career-based interventions, this study concluded that “students who are in the earlier stages of career decision-making are likely to be less clear, certain, and satisfied as compared with those in the latter stages” noting the importance for designing and implementing interventions (Osborn et al, 2020, 45).

Placement and professional experiences

The collated evidence shows that work placements, sandwich placements and internships can have a positive experience on student progression outcomes. Smith et al (2018) conducted a study of 99 computing graduates who registered for the national placement service in Scotland while studying at any of the 14 Scottish higher education institutions in the sample. As context, within this study “the term placement is used to encompass all types of relevant paid work experience undertaken while

studying, irrespective of length or academic credit” and in this research the placements explored were non-compulsory (Smith et al, 2018, 360). Using triangulated quantitative and qualitative data analysis, they found the long-term benefits of work placements to be: financial earnings, speed of employment into graduate positions and likelihood of employment compared to those graduating without completing a placement. This research also touches on inequity in placement knowledge, opportunity and social/cultural capital, noting “a lack of social resources that might otherwise have encouraged them to pursue placement with more vigour” (Smith et al, 2018, 365).

Previous research has highlighted the positive association between sandwich placements and progression to further study or employment (Hefce, 2015 in Wilson and Dauncey, 2020). More recently, Kerrigan et al (2018) triangulated UK data (HESA, DLHE and institutional data and interviews 18 months after graduation) to establish the impact of a sandwich placement on social and cultural capital and graduate level professional occupation for those graduating between 2011-12 and 2013-14. It is of particular importance as it focuses attention on areas of structural disadvantage. They conclude that “participation in a sandwich placement year is strongly associated with enhanced graduate prospects” (Kerrigan et al, 2018, 95) and this is replicated for widening participation students (compared to those who had not completed a year in work). In this regard, a sandwich placement (if available and desirable for WP students given the time/financial commitments) can provide a levelling/ equalising effect on graduate outcomes. As reported in the TASO call for evidence, for students at Nottingham Trent University, “the gap in professional employment rates between widening participation and non-widening participation students disappeared if they had undertaken a sandwich placement” (Wilson and Dauncey, 2020).

Using the Korean Education and Employment Panel Survey, Jung and Lee (2016) explored internship experiences and their influence on job performance among university graduates in Korea (n=961). In this study, internships were defined as “short-term, employment-related work experience programs that have been arranged through a mutual understanding between individuals, institutions of higher education, and employers in South Korea context” (Jung and Lee, 2016, 252). While acknowledging that the primary aim of internships is to improve participants’ employability skills, this study focused on secondary aims, namely job search duration, wages and job satisfaction. Jung and Lee (2016) found that internship experience improved job performance and job satisfaction. This study also found that participation in internships shortened the time taken to employment after obtaining a degree and enhanced wages.

Kouakou (2018) evaluated the impact of a career development programme grounded in experiential learning and explored the relationship between professional experience and professional success. During 2017, the City University New York Service Corps Program ran across multiple campuses, with 700 students and 120 community partners. The programme combined a community placement and pre-service training to enhance participants’ professional success. This evaluation found that the programme successfully developed employability skills, personal development and professional plans. Interestingly, although they reported a very high number of programme alumni obtaining a job (part or full-time) within two years after programme completion, this data indicated that the development of employability skills was not a good predictor of professional success.

Like previous themes, some studies evidenced the impact of work experience on career development, rather than employment outcomes. Lakeland's (2019) UK case study for Office for Students is one example. This overview provides an insight into robust methodology working towards evidencing improved graduate level employment rates for underrepresented students by scaling up existing employability interventions. The interim measures of success – placement uptake and career readiness support via confidence and resilience, were positive. Schnoes et al (2018) also explored the impact of the provision of internships for 29 life sciences PhD students at the University of California, San Francisco and an additional 22 PhD students at the University of California, Davis campus. The aim of this intervention was to help PhD students make better informed career choices through increasing confidence in decision-making and avoiding a default post-doctorate. This evidence is on the cusp of Type2/3 and is included due to the triangulated quantitative/qualitative data analysis and replication in two settings. While the internship was not a significant predictor of time to degree completion, and while there was no comparison group, confidence increased from 58 to 86%, and career uncertainty decreased from 45 to 14%.

Gaps in the progression evidence base

The review anticipated, based on previous publications (Webb et al, 2017; Wilson and Dauncey, 2020) that there would be a lack of sources pertaining to progression outcomes. There were more extraneous sources found in the progression database search, but the lowest amount after inclusion criteria has been applied. The impact of this limited search means that few conclusions can be drawn on interventions which show demonstrable impact on employment or further study. This section of the review has widened the scope to discuss indicative robust evidence of employability skills alongside suggestions for the study of progression outcomes.

Many of the studies included in this evidence base come from health or science disciplines. This is perhaps indicative of the use of evaluation in these areas. However, over all there is a lack of evaluation language or terminology seen in this evidence base before 2018. The development of language in later studies, supported by the disciplinary contexts, suggests that the progression evidence base is on the edge of change. Support for practitioners, academics and evaluators should be provided to continue this trajectory and this will be recommended.

One of the difficulties with assessing progression outcomes is the time lag between intervention and evidence. Wilson and Dauncey (2020, 22) note that:

“while there is strong and robust evidence base for what works to foster employability skills in higher education (driven largely by Advance HE and AGCAS), there is little available evidence of what works for higher education interventions with regard to employment outcomes.”

The presented evidence base has included the impact on intermediate outcomes (such as changes in knowledge, skills and behaviour). Furthermore, some of the studies above measure intentions and attitudes towards employment, rather than any observed or reported changes in knowledge, skills or

behaviour. As this review has included impact on employability skills given the lack of linked employment data, the limitations of self-reporting change need to be considered.

The progression agenda has moved on since the Webb et al (2017) review, with progression outcomes embedded in the Teaching Excellence Framework, and the measures of success shifting from the Destination of Leavers in Higher Education Survey (DHLE) to the Graduate Outcomes Survey (GO). The 2017 search terms were tested and found to be applicable. The terms were not updated to include 'Graduate Outcomes' as it is noted as a relatively new and emerging term. However, this is a term frequently used in the UK and Australia (linked to survey methodology) and could be a limitation of this search.

Methodological limitations

The evidence in this section shows that longer term, longitudinal evidence is often a desired but elusive measure. The impact of career-based interventions are often intermediate or alternative outcomes, sometimes aligning with other measures, such as access, retention and attainment and often with the development of personal skills or career aspirations.

Very few of the studies have replicated an intervention in different locations, context, or with distinct groups. While there might be evidence that something has worked on a particular course at one institution, there is little understanding of how successful those interventions would be, should they transfer to different contexts. A critical appraisal of replication may question whether replication is even a possibility in higher education.

Furthermore, there is little insight into how different interventions are experienced by different groups of students. Within this theme, course and skill set dominate the intervention scope rather than targeted action based on student characteristics. Most sources report sample size, gender split and mean age but do not report findings by these groups. This is an area which should be monitored given the assumptions made about changing student skill sets, aspirations and behaviours; there is a risk that progression interventions could draw upon a deficit approach if this is not addressed. Self-selection for interventions or incentivised interventions can create additional bias and positive outcomes could be reported in student groups who are likely to already benefit from structural advantage.

This corroborates the findings of Foster and Francis (2020) who noted a lack of studies in their review which differentiate impact by student groups. They also noted the limitations of studies which report impact (usually quantitative significance) without addressing the contextual factors of the interventions. Supporting the reflections in this report, they note "the continued oversight of context in research design and implementation – both individual and institutional – is in our view staggering" and leads to unanswered queries regarding why an intervention worked (Foster and Francis, 2020, 837).

Conclusions

Using an integrative methodology, this review filtered 13,810 sources (published between 2016 and 2021) and synthesised 161 pieces of literature to report the evidence of demonstrable impact on student outcomes across access, retention, attainment and progression. A transparent overview of the methodological process has been presented, including areas of critique from key stakeholders, limitations and gaps in the evidence base. Findings are presented thematically for each area of the student lifecycle.

The findings suggest clear relationships between each area – access, retention, attainment and progression – in terms of intervention design and holistic impact on more than one outcome measure. Themes which exist across more than one area could be described as ‘high impact’, although contextual findings and limitations in long-term outcome data would suggest that this term is used cautiously. Examples include: early interventions which are delivered pre-entry and during transition and induction; interventions which provide financial aid or assistance to students pre and post entry; interventions which are designed with student centred pedagogy and purposively aligned with the student’s curriculum; interventions which provide personal support and guidance for students; and the use of learner analytics to support identification of student need, intervention design and evaluation of subsequent impact. These reflections could be related to the concept of ‘mattering’ (see Flett, 2018), the idea that ‘the university’ cares, a sense of which became evident from several studies across all the areas reviewed.

This review has highlighted a gap in the literature in relation to differential impact on student groups. The access literature premised student characteristics in the studies more heavily than other areas, but still lacked evidence of impact. In the retention, attainment and access area, student characteristics were reported as a description of the sample, as an overview of matched comparison groups, or while controlling for dependent variables. There is a dominance of sources which derive from intervention in the United States. There is also a lack of evidence that collates impact across more than one setting; country, institution, or course/subject. The dominance of STEM subjects in the review also highlights a gap in impact evidence within the arts and social sciences.

Limitations of the review include: a lack of evidence on long-term student outcomes; outcome definitions which risk overlooking intermediary/mediating outcomes; a dominance of quantitative studies aligned with metric-driven student outcome definitions; a messiness in the evidence base despite clear inclusion/exclusion criteria; a skew in the volume and quality of sources found in each area.

Recommendations from this evidence base have been collated and are presented as guidelines for demonstrable impact. The challenge to all sector stakeholders is to fix the ‘leaky pipeline’ of impact evidence – institutions and other funders should ensure that projects are accountable for the measurement of long-term impact beyond ‘alignment’ to strategy at the point of funding. The sector and institutions have a responsibility to de-prioritise ‘quick wins’ and invest in the longevity of projects that are designed, implemented and evaluated over a reasonable period of time. Finally, practitioners and leaders alike need to consider how to embed ‘stickiness’ in policies and practices known to enhance student outcomes.

Recommendations: guidelines for demonstrable impact

Recommendations for higher education practitioners

- + To fix the leaky pipeline of impact evidence, consider how practice becomes 'sticky' beyond funding, personal interest and time commitment.
- + Evaluation strategies, including resourcing and a commitment to long-term evidence generation, should be built into project plans and business cases.
- + Become aware of and then make use of existing institutional data to provide a baseline and then evidence of change. It is not always necessary or proportionate to collect new data to evidence impact.
- + Do not limit dissemination to peer review publications. Open access resources, supported by sector organisations, have a place in this evidence base.

Recommendations for researchers/funders

- + Learn from researching during a pandemic to allow appropriate time/resources/funding for work which is due to be conducted remotely.
- + To consider how they can support research and evaluation across the whole student lifecycle and create dedicated research opportunities for areas which are weak in the evidence base (eg progression) and incentivise academic interest in all areas of the student lifecycle.
- + The combination of retention and attainment outcomes in the literature suggests that these areas could be combined into student 'success'.
- + Align reviews of evidence with the reporting cycle of the Access and Participation Plans (20-25), given the regulatory commitments to evidencing impact within them.
- + Future reviews should differentiate between short-, medium-, and longer-term student outcomes and begin to compile an evidence base of the theories of change. A focus on student outcomes may miss the intermediate/incremental stages of evaluative thinking.
- + Evidence reviews should make use of institutional websites as part of the literature search to find the most recent activity to gather insights into ongoing and future work.
- + Alternatively, adopt a 'call for evidence' approach (like TASO) to gather the nuances of institutional activity. A longitudinal 'call' would be the most effective to gather impact on student outcomes.
- + Produce a guide/toolkit for how to replicate small-scale empirical and causal evaluations (beyond one institution, one course, different student groups) and evaluations of programmes which focus on multiple interventions.

Recommendations for higher education institutions

- + Review enhancement process including annual quality monitoring and review processes as they may be contributing to the short-term focus/reporting of enhancement work.
- + Encourage practitioners to publish their work within institutional repositories and with sector organisations.
- + Value qualitative evidence of impact, from practitioner reflections to students' voices to disrupt the dominance of quantitative metrics in the data hierarchy.
- + To fix the leaky pipeline of impact evidence, support and resource longevity in intervention design and evaluation, moving away from short 'quick wins' and investing in projects which are designed, implemented and evaluated over a significant time period (eg two to three years).
- + To consider how to achieve 'stickiness' in the leadership and governance of teaching, learning and assessment practices that are known to enhance access, retention, attainment and progression.
- + Ensure that projects are accountable for the measurement of long-term impact beyond 'alignment' to strategy at the point of funding.
- + To re-include assessment as a key consideration and evaluate the impact of any changes to assessment practices.

Recommendations for higher education sector

- + Due to a paucity of evidence relating to assessment practices, the sector should spotlight the exploration of assessment practices as an inclusive part of the teaching and learning agenda.
- + Create a valued profile for research and evaluation of progression outcomes, aside but distinct from the policy-led graduate outcomes agenda.
- + Encourage practitioners and researchers who focus on access, retention and attainment to look beyond these measures to progression outcomes and include them in current or future work, rather than relying on progression research to look backwards.
- + Provide inclusive spaces for practitioners and researchers working with progression outcomes (communities of practice, conferences, funding bids, rewards and recognition).
- + Develop a culture which reports, publishes and values failures and lessons learnt to avoid an over-reliance on good practice and positive outcomes.

Appendix 1

Integrative review protocol: access, retention, attainment and progression (Advance HE)

April-July 2021

Summary

Sheffield Hallam University is leading an integrative review to explore the evidence base of demonstrable impact on student outcomes in access, retention, attainment and progression. The key research question asks: what evidence-based policy or practice has had a demonstrable impact on student outcomes (access, retention, attainment and progression) since 2016?

The objectives of this review are: to undertake an integrative review (IR) which assesses a range of literature concerning the scope of access, retention, attainment and progression in higher education; to append sector-wide guidelines for developing demonstrable impact regarding policy and practice; to identify gaps in the evidence base and make recommendations for further work.

Background: access, retention, attainment and progression

The scope of access, retention, attainment and progression is sometimes collated into access, success and progress and covers the whole student lifecycle / journey. This holistic approach to exploring student outcomes was promoted by the previous literature review (Webb et al, 2017) and is conceptualised within the Advance HE framework. However, while some lifecycle approaches are emerging (Roberts 2020, Thomas, 2020) the literature since 2015-16 is nuanced, particularly on the impact of data analytics (eg Foster and Francis, 2020).

Kandiko-Howson and Buckley (2020) note that exploration and measurement of student outcomes is now highly politicised and shifted from process / programme evaluation to outcome evaluation linked to quantitative sector datasets. This critique moves beyond arguments regarding the limitations of the TEF/NSS (Morrish, 2019) and is moving into spaces such as algorithm-based outcomes (Allen, 2020). In addition, there has been a growing focus on 'what works' in higher education since approximately 2012 (Thomas, 2012; Thomas et al, 2017). There is an impact-driven evidence base being collated by the new higher education 'what works' centre (currently funded by the Office for Students), Transforming Access and Student Outcomes (TASO), with a focus on the interventions that lead to improved student outcomes. Its access evidence base includes: financial support; information, advice and guidance; mentoring, counselling, coaching and role models; multi-intervention outreach; and summer schools. Its success evidence base includes: financial support; mentoring, counselling, coaching and role models; and programmes of student support. There are gaps, namely interventions within the progress area (such as academic advising, careers support, internships) and success-based learning and teaching approaches (courses/module design to support belonging and course communities; inclusive assessment and feedback; compensation rules; assessment regulations and marking practices).

To focus the scope of this review, the Advance HE Framework will be used as a guide for the search strategy, focusing on those initiatives and interventions that have been previously identified and looking in detail at claims of demonstrable impact. This current review will therefore test the Framework for its current applicability to the higher education sector, which is even more necessary given the changing higher education practices during and beyond the Covid-19 pandemic. The SOSG will guide this testing and provide management of scope and unintended outcomes (those initiatives beyond the scope of the review).

The evidence base

This review also focuses on evidence of demonstrable impact beyond peer review publications. The proposed research team is aware of the publication landscape in higher education. Many approaches which impact on student outcomes are shared open access across institutions in the spirit of collaboration (notably seen in the Scottish approach to enhancement). Sector agents and communities of practice produce publications which are not likely to appear in traditional journals, yet they are widely used. Therefore, this review champions the importance of grey literature (not published/not peer reviewed) to produce an inclusive review. The standards of evidence will provide the quality assurance, rather than the place of publication.

Definitions

Access, retention, attainment and progression

The scope of this review (tested by the stakeholder groups) will use the definitions provided by the 2016 review (p9) and based on HEA (2015):

- + access to HE – the extent to which groups can gain entrance to different types of higher education institution
- + retention – participants' likelihood of continuing or withdrawing from study
- + attainment – the extent to which students are enabled to fulfil their potential; sometimes discussed in terms of achieving a 2.1 or first-class degree
- + progression – successful transitions within the programme of study and afterwards to employment or further study)

Demonstrable impact

In addition to the Teaching Excellence Framework (currently emerging from a significant review), the higher education sector uses the Access and Participation Plan, as one of the regulatory tools to monitor student outcomes across access, retention, attainment and progression. The Office for Students aims to oversee how higher education providers will improve equality of opportunity for underrepresented groups to access, succeed in and progress from higher education.

Recently, the OFS has tightened its own guidance (through the commissioning of bespoke research) and increased their expectations of impact evidence. This includes setting evaluation outcomes for providers (and itself) which are:¹¹

- + providers commit to and prioritise a culture of evidence to support their work to eliminate inequality in higher education
- + providers use evidence to understand local and national inequalities, and to design impactful programmes
- + providers evaluate to understand impact, share and learn from evidence.

Since 2018/19, these outcomes have been operationalised within an evaluation framework which is supplemented by three Standards of Evidence:¹²

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.

Type 2: Empirical Enquiry: the impact evaluation collects data on impact and reports evidence that those receiving an intervention have better outcomes, though does not establish any direct causal effect.

Type 3: Causality: the impact evaluation methodology provides evidence of a causal effect of an intervention.

As this literature review calls for evidence of 'demonstrable impact' on student outcomes, it is appropriate to align this review to sector Standards of Evidence. The fact that these Standards have been designed to support evidence gathering across access, success and progress supports this alignment.

Comprehensive guidance on the distinction between Type 1, 2 and 3 evidence was produced as part of a collaborative project led by the Centre for Social Mobility (2019) and is included in Appendix 2. These standards have been developed specifically for interventions and initiatives which seek to enhance access into higher education. This review seeks to explore and support their use in all phases of the student lifecycle.

11 www.officeforstudents.org.uk/advice-and-guidance/promoting-equal-opportunities/evaluation/strategy-for-evidence-and-evaluation-in-access-and-participation/what-needs-to-change/

12 www.officeforstudents.org.uk/media/6971cf8f-985b-4c67-8ee2-4c99e53c4ea2/access-and-participation-standards-of-evidence.pdf

Key research question

- + What evidence-based policy or practice has had a demonstrable impact on student outcomes (access, retention, attainment, and progression) since 2016?

Supplemented by:

- + What are the 'standards of evidence' used to make claims of impact?
- + With reference to the nuances of the Advance HE framework, which policies/practice have most demonstrable impact on student outcomes?

Objectives:

- + To undertake an integrative review (IR) which assesses a range of literature concerning the scope of **access, retention, attainment and progression** in higher education.
- + To append sector-wide *Guidelines for Developing Demonstrable Impact* regarding policy and practice.
- + To identify gaps in the evidence-base and make recommendations for further work.

Scope and methodology

This approach tests and build theory through an iterative process of evidence review and wider sectoral engagement (see Coren and Fisher, 2006 and Austen et al, 2016).

Key question(s) and objectives will be scrutinised by key stakeholders – identified for this purpose – known as the Student Outcomes Stakeholder Group (SOSG). This will be in addition to the Advance HE Advisory Group (AAG). This group will add independent scrutiny, reduce bias and build ownership and 'reach'. Jones-Devitt, Austen and Parkin (2017) note

“The IR method has been particularly effective in generating reach on publication due to the commitment from Steering Group members who are well-placed to disseminate and advocate for this work.” (2017, 4)

These groups will be invited to scrutinise the milestone activities of the integrative review via an appraisal process which will operate in both written and verbal form. Following revisions from SOSG, a research methods plan will be constructed and scrutinised continuously.

Possible sources of data

A range of evidence will be used, incorporating breadth of sources to minimise selection bias; including narrow types of highly specific evidence to grey literature, research-in-progress and unpublished sources.

Specifically, this includes:

- + grey literature from sector bodies (namely Advance HE, TASO, QAA, SEDA, Jisc, OFS, Sutton Trust, NEON, Wonkhe, HEPI, HEAT, UUK, SRHE, HEIR, Social Mobility Commission, NUS)
- + grey literature from institutional repositories, blogs, research centres
- + via EBSCO Information Services – British Education Index; Education Resources Information Center (ERIC); and HW Wilson (www.ebscohost.com) – providing access to sources from around the globe.

Available desk-based methods including:

- + meta engines
- + educational research databases and indexes
- + main bibliographic databases
- + citation tracking and indexes
- + dissertations and theses databases
- + grey literature databases
- + national policy databases
- + electronic full-text journals
- + journals and non-bibliographic databases
- + hand-searching
- + conference abstracts or proceedings
- + other reviews
- + unpublished studies.

Field-based methods:

- + continuous dialogue with SOSG as identified experts.

Search parameters

An integrative review methodology allows search criteria to develop with expert input from the stakeholder groups to ensure suitability and critique.

This review will also apply and review the learning from the previous 2016 review (see Appendix 1) to test suitability:

Search strategy:

- + controlled vocabulary and free text key words to maximise coverage of research questions
- + dictionary / thesaurus of each database accessed to reduce ambiguity
- + Boolean operators and key word truncation tested within the internal moderation process
- + search filters and inclusion/exclusion criteria used to adjust assumptions concerning volume and depth of found evidence.

Pilot search strategy

A scoping exercise was conducted to test the key search terms taken from the project brief and tender documentation, learning from the 2016 review and the Advance HE framework. Various search strings were tested using Boolean methodology, replicating the 2017 review.

ACCESS

(college OR degree* OR further education OR graduate* OR higher education OR postgraduate* OR student* OR tertiary OR undergraduate* OR university*) AND (access OR admission* OR application* OR intake OR recruit* OR participate*)

RETENTION

(college OR degree* OR further education OR graduate* OR higher education OR postgraduate* OR student* OR tertiary OR undergraduate* OR university*) AND (complete* OR depart* OR drop* OR graduate* OR retain OR persist* OR withdraw*) NOT High School, Secondary Education, School Holding Power, High School Students, High School Graduates, School Dropouts

ATTAINMENT

(college OR degree* OR further education OR graduate* OR higher education OR postgraduate* OR student* OR tertiary OR undergraduate* OR university*) AND (attain* OR classification OR G.P.A. OR GPA OR mark* OR result* OR outcome*) NOT High School, High School Students, Elementary Education, Middle School Students

PROGRESSION

(college OR degree* OR further education OR graduate* OR higher education OR postgraduate* OR student* OR tertiary OR undergraduate* OR university*) AND (advance* OR career* OR destination* OR employment* OR further OR job or opportunity* OR progress* or prospect*) NOT High School, Secondary Education, High School Students, Elementary Education, Middle School Students

Scoping review

Two researchers explored the databases and grey literature sources pertinent to this review. The sector agencies which will be reviewed include: Advance HE, TASO, QAA, SEDA, Jisc, OFS, Sutton Trust, NEON, Wonkhe, HEPI, HEAT, UUK, SRHE, HEIR, Social Mobility Commission, NUS. Institutional repositories will also be reviewed eg Centre for Higher Education Research and Evaluation (Lancaster) and Centre for Higher Education Research and Scholarship (Imperial).

There are two significant literature reviews that need to be considered in the scoping of this work, especially as they also make claims regarding demonstrable impact: The TASO report [Gaps in the Student Experience 2020](#) was an international literature review on attainment, wellbeing, retention and employment outcomes. The findings (Academic search Complete, PsycARTICLES, PsycINFO, ERIC and Business Source Complete databases) summarise 157 studies including 37 from a call for evidence and the others (2006 onwards). There was a notable absence of studies related to employment outcomes (progression).

The second TASO report [The impact of interventions for widening access to higher education](#) (2020) reviewed 92 international studies that provided 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. It used Google Scholar and Google search to find published and grey literature (2012 onwards).

The previous literature review (Webb et al, 2017) accessed three databases via EBSCO Information Services – British Education Index; Education Resources Information Center (ERIC); and HW Wilson. These databases are also accessible to researchers at Sheffield Hallam University, and the same search criteria could be used to identify recently published material within the same parameters. However, it may be beneficial to widen the scope of the review to include additional sources, such as those accessible through ProQuest Central. ProQuest contains a range of subject-based databases (eg arts and humanities, psychology, nursing and allied health), as well as several international collections, such as the Australia and New Zealand database, the Continental Europe database, and the US News stream. ProQuest was used in previous search led by a Hallam team (QAA review 2017).

Agreed search strategy

The search strategy was subject to confirmation by the AAG and SOSG and replicated that used in the previous 2017 review – see Appendix 1 for full details.

Search area	Include	Exclude
Date of publication	2016 – 2021	
Rationale	The date parameters (2015/16 onwards) are based on the timeline of the previous AHE review.	
First phase	Apply through filters in the database.	
Second phase	Confirm dates when reviewing the abstract.	
During analysis	Check dates the study was conducted whilst reading the main body of the text (maybe historical reference). Cross checking any 2016 sources for overlap with previous review and exclude as necessary.	
Location of evidence	UK and international literature	

Search area	Include	Exclude
Rationale	The SOSG commented on the limitations of applying a location exclusion filter to these searches. A focus on UK, AUS, US for example, may exclude important work around the world, such as in African nations and Europe. The 2017 review did not apply a location filter and felt that whilst the database choices provided some in built restrictions, their findings were international in scope. They also reflected on the dominance of US sources, and some findings which were not wholly relevant to a UK content. These points need to be considered alongside the feasibility of the study and the interests of the funder. For example, the following criteria could be considered during the review for applicability: + The institutions tend to be publicly-funded. + The government imposes caps on student numbers. + The government imposes maximum tuition fees. + The typical length of the undergraduate degree programme is between 3 and 4 years. + The government sets targets for widening participation. + The admissions process is run by a centralised body. + Students are only allowed to apply for a limited number of institutions. + Students apply for a specific course within a particular department. + Admissions are primarily based on academic achievements. + Students study towards a specialism from the first year of their degree. + The student body typically comprises significant numbers of those who live at home and those who live on-campus. + There is a mix of routes into the teaching profession within the context of higher education. + Teaching pre-dominantly happens in-person. + The institutions set their own assessments. + It is common to find a range of different assessment types. + The institutions certify the grant of the awards.	
During analysis	As no search filters are applied for location, it is important for the review to focus the analysis on findings which link to the funding context (dominated by UK HE practitioners). The location criteria above will be considered during analysis, reporting and recommendations, rather than at the search stage. The location limitations of the review scope (database search) will also be transparent and will appeal for further exploration of a more inclusive context in future funding bids.	

Search area	Include	Exclude
Language	Literature written in English	Literature not written in English
Rationale	While this adds bias to the review, this project does not have the resources/ timeframe for translation.	
First phase	Apply through filters in the database.	
Access	Accessible literature	Literature which is only accessible on receipt of payment
Rationale	While this adds bias to the review, this project does not have the resources/ timeframe for access payments.	
During analysis	Confirmation of access will be known when the source is opened for analysis. Exclusion applied if payment is required.	
Authors	Peer review publications and grey literature written by a variety of stakeholders (eg policy makers, students, academic staff, professional services, awarding bodies, sector agencies)	
Rationale	This review aims to include an inclusive evidence base. The IR quality assurance process will ensure suitability. High quality will not simply be filtered by peer review or citation count as this excludes many open access resources, a frequent publication route of those within higher education institutions and higher education agencies/organisations. Any relevant evidence base created by students will also be included.	
First phase	No filters applied in the database. Grey literature accessed by hand searching.	
Focus	Access, retention, attainment, and progression into and beyond higher education	Primary, secondary, further education (not the focus of the review but not discounting the possible pre-entry HE impact)
Rationale	This links to the set brief for the review. Student characteristics and disciplinary factors will be noted for the included sources and presented as proportions in the final report (as per 2017 review). The search strings used by the previous 2017 review will be adopted (one change to not exclude Adult Education – SOSG recommendation), with filters applied to remove educational contexts (eg High School, Secondary Education etc).	

Search area	Include	Exclude
First phase	Apply via search strings and filters (EBSCO: Adult Education, Continuing Education, Further Education (Great Britain), Higher Education, Professional Education; Education Level: Adult Basic Education, Adult Education, Higher Education, Postsecondary Education, Two Year Colleges). The access search string applies pre-secondary exclusions as others could be the focus of pre-entry HE impact.	
Second phase	Confirm focus when reviewing the abstract.	
During analysis	Check focus of the study while reading the main body of the text (eg if the impact is not specifically on access into HE).	
Type of HE study	Access, retention, attainment, and progression within foundation year, undergraduate and postgraduate courses	
Rationale	This links to the set brief for the review.	
First phase	Apply via search strings.	
Second phase	Confirm type of study when reviewing the abstract.	
During analysis	Check type of the study while reading the main body of the text.	

Search area	Include	Exclude
Definitions of outcomes	Specific reference to impact on student outcomes in HE: + access to HE – the extent to which groups can gain entrance to different types of higher education institution + retention – participants' likelihood of continuing or withdrawing from study + attainment – the extent to which students are enabled to fulfil their potential/learning gain; sometimes discussed in terms of (but not limited to) achieving a 2.1 or first class degree. To also consider exit routes and modular credit as success + progression –successful transitions within the programme of study and afterwards to employment or further study.	Secondary school outcomes. Progression from secondary school into FE.
Rationale	This links to the set brief for the review. The definitions of each area are taken from the 2017 review. The highlighted text are additions, based on SOSG feedback regarding the diversity of definitions of 'outcomes' and a need to avoid deficit assumptions when defining what a 'good' outcome is.	
During analysis	Check outcome focus while reading the main body of the text – identification of one or more of the outcomes noted above.	
Types of data	Type 2: Empirical standard of evidence Quantitative and/or qualitative evidence of a pre/post intervention change or a difference compared to what might otherwise have happened	Type 1: Narrative Evidence of impact elsewhere and/or in the research literature on access and participation activity effectiveness or from existing evaluation results

Search area	Include	Exclude
	Type 3: Causal 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	Type 1: Narrative Evidence of impact elsewhere and/or in the research literature on access and participation activity effectiveness or from existing evaluation results
Rationale	The use of these standards is aligned to moves in the sector (OFS, TASO) and notions of 'demonstrable impact' identified in the tender brief. The focus on quantitative and/or qualitative data is also linked to the reflections of researchers in the previous review and SOSG suggestions.	
Second phase	Confirm the inclusion of evidence when reviewing the abstract.	
During analysis	Confirm that the evidence included in the source is type 2/type 3 when reviewing the main body of the text.	

Analytical framework

A key challenge for integrative reviews concerns the nature of the process which, as Victor (2008) acknowledges, is more iterative than traditional systematic reviews, while needing to maintain transparency and reliability. It is grounded more on expertise and judgement in order to build theory. It is deemed appropriate due to the complexities of evidencing 'demonstrable impact' and the need to influence evaluation approaches in this review area (Webb, Wyness, and Cotton, 2017).

The process adheres to criteria recommended by the Evidence for Policy and Practice Information and Coordinating Centre (2010):

Internal review appraisal (AAG): proposed team is selected for contrasting skills and expertise to assure robustness, relevance and quality.

External review appraisal (SOSG): will be invited to provide independent appraisal throughout key stages.

Good processes: internal moderation will be applied at various stages in the review, eg when coding and appraising studies, to ensure consistency. The research team will assess evidence independently and a pilot moderation process will occur early on to verify appropriateness.

Maintaining database records: undertaken at each stage. Firstly, to enable conclusions drawn by the review process to be tracked for transparent decision-making; secondly, as the database becomes more comprehensive, it becomes a useful resource to address sustainability and provides useful information for other researchers concerning further work; thirdly, it provides detailed information on studies accessed.

When each database/search is conducted, the records are stored on a shared document as follows:

Database/ Source	Dates covered	Date searched	Search strategy	Hits	Notes	Results in filename

Data management

Phase 1: database/grey literature searching and recording

Suitable references found using the inclusion exclusion criteria (review of title/abstract) for each search will be recorded using RefWorks. This will include full lists of all hits before inclusion and exclusion criteria have been applied. The researchers will create a shared RefWorks account, a detailed system for collating excluded and included literature, and for identifying duplicates. This system will enable transparency and will provide useful information for other researchers who may update or progress this work in the future.

Live data (records and database tracking) will be saved on the host institution internal Q drive on a weekly basis for the duration of the project. This drive provides secure access and an automatic backup to an external server.

Phase 2: abstract relevancy sorting

To aid the creation of a sample of literature, the following abstract relevancy scores will be used by the researchers. The scoring system was piloted and amended as necessary before application.

0	1	2	3	4
Did not meet exclusion and/or inclusion criteria No abstract is available, it is not clear whether the content is relevant from the title.	Access, retention, attainment and/or progression within HE is discussed but is not the main focus of the source. OR wrong theme.	Some reference to one or more outcomes: access, retention, attainment and progression within HE. OR wrong theme.	Clear reference to one or more outcomes: access, retention, attainment and progression within HE.	Specific reference to one or more outcomes: access, retention, attainment and progression within HE.
	There is no evidence presented in the source	Type 1 evidence identified in the findings (literature review, description of an intervention, a theory of change)	Empirical but not quite Type 2 evidence identified in the findings (descriptive data of cross section/point in time eg single survey or focus group of satisfaction)	Type 2/3 standards of evidence relating to impact on outcomes (pre/post change measured at two points in time, comparison groups, predictive measurement eg regression analysis or causal change with a control group)

Data extraction and synthesis

Data extraction will combine analysis of the following:

- 1 Numeric data: often these take the form of 'effect sizes' for inclusion in a meta-analysis, but numeric data also includes, for example, numbers of study participants, intervention costs and numbers in specific sub-groups.
- 2 Categorical data: in which characteristics of studies can be summarised easily (eg by location of intervention or its theoretical framework).
- 3 Free-text narrative data: information which cannot be summarised numerically and is too detailed and varied for categories to be useful. These data are extracted in 'free-text' form and may take the form of, for example, summaries of interventions, the verbatim accounts of participant quotations, or key concepts and themes that were identified by authors of the original studies.

Once the inclusion and exclusion criteria have been applied to all searches, a final database of included literature will then be analysed according to the principles of the 'weight of evidence model' (EPPI).

Source	A: Methodological Relevance	B: Methodological Quality	C: Topic Access	C: Topic Retention	C: Topic Attainment	C: Topic Progression	D: Overall

A = Methodological Relevance: the appropriateness of the use of that study design for addressing the review's research question (evidence of demonstrable impact on student outcomes using Type 2 and Type 3 evidence – see Appendix 2)

B = Methodological Quality: the trustworthiness of the results judged by the quality of the study within the accepted norms for undertaking the particular type of research design used in the study (note sample sizes, institution/discipline/mode of student focus, ethics etc)

C = Topic Relevance: the appropriateness of focus of the research for answering the review question (relevance to one or more outcomes: access, retention, attainment, progression)

D = Judgement of overall weight of evidence (WoE) based on the assessments made for each of the criteria A-C

The findings from each of the included studies will be pooled under each research question. The reviewers will explore what each study contributes to answering each question and how answers to questions are interrelated.

This work will inform further sector-wide approaches to promoting demonstrable impact in *access, retention, attainment and progression*. The research will present outputs in various ways to widen accessibility. The outputs will comment on those initiatives which provide evidence of demonstrable impact and the evaluation approaches to evidence generation.

Outputs

A Communication and Dissemination Plan will be devised early in the process, but this is likely to include:

- + **Short-form electronic executive summary** of key points to engage key decision-makers involved in policy and practice.
- + **Good-practice guidance** titled *Guidelines for Developing Demonstrable Impact*
- + **Full research report** with appendices of searchable, user-friendly dataset of selected literature, assessment of evidence, quality assessment, methodological analyses and researcher reflections.
- + Blog/vlog, briefing, screencast and/or webinar as suggested by Advance HE during or following the review.

Communication plan

Publication of output by Advance HE.

Launch at the end of the project by Advance HE.

Internal dissemination by project team at Hallam: committees, internal conferences, internal media communication.

SOSG members to promote via own networks.

Newsletters, blogs, email promotion and face to face meeting attendance (subject to confirmation by Advance HE).

Twitter promotion.

Promotion to practitioners and sector leaders via networks.

Conference presentations and attendance by project researchers (subject to confirmation by Advance HE).

Open access to raw data to allow continued analysis of the topic area.

Anticipated challenges

The size and scope of this review (data parameters, holistic topic focus, international scope) is challenging and requires effective management by an experienced research team, and oversight by an internal and external Steering Group (SOSG/AAG). This will include input into the search strategy and inclusion/exclusion criteria. The discussions with the SOSG are recorded as evidence in line with IR practices and will enable reflexive decisions to be made as the review progresses. Some of these considerations are outline below:

This review is focusing on demonstrable impact (Type 2 and Type 3 Standards of Evidence), published in a range of peer reviewed publications and grey literature. It is possible that the standards of evidence required for the review are not yet in the evidence base and the OFS shift to strengthen evaluation has not yet resonated with higher education providers and sector organisations. The review could default to including Type 1 evidence in the review or retain the focus and report on the challenges of demonstrable impact in higher education. An initial scoping activity will be conducted which explores the balance of evidence and this will be reported to the SOSG and AAG for discussion of any mitigating decisions.

The sector may be experiencing evaluation fatigue and publication lag due to Covid-19. The focus of recent institutional dissemination has been on implementation and specifically learning and teaching (success, not necessarily access and progress) following regulatory pressure from OFS and QAA regarding quality and standards. Balancing workload and supporting mental health have provided a well needed evaluation safety net; for the last 12 months practices just needed to be 'good enough'. This limitation may skew the data sources. An initial scoping activity will be conducted which explores the balance of evidence and this will be reported to the SOSG and AAG for discussion of any mitigating decisions.

A further Covid-related limitation of this review is the applicability of pre-2020 strategies/initiatives/activities to the post-Covid future. This is especially pertinent given the date of the associated Advance HE framework. During the internal moderation, in consultation with the Steering Groups, and during analysis and reporting, the applicability of the sources to blended/remote/online delivery could be assessed. This would futureproof the review and ensure that the findings are relevant to the current higher education context. The vast experiences and areas of expertise within the research team provides a mitigation strategy for this ongoing assessment.

Bias may be found in the review from an over-reliance on the access area; practitioners in this space have the most well-developed evidence base as historically, evaluation practices are well established. This could cause an imbalance in the sources found. An initial scoping activity will be conducted which explores the balance of evidence and this will be reported to the SOSG and AAG for discussion of any mitigating decisions.

Protocol questions for the SOSG

- 1 Scope: are the research questions and objectives fit for purpose, aligned with the methodology and of use to the sector?
- 2 Data sources: to avoid a Google search, sector organisations will be targeted for publications of grey literature. Does the proposed list have the scope/content necessary for this review?
- 3 Data sources: will the inclusion/exclusion criteria enable a robust review?
- 4 Limitations: are there any obvious challenges that need to be overcome before the review commences?

Search strategy

Appendix 1: Search methodology and results (taken from Webb et al 2017, p 130)

Universal search terms: college OR degree* OR further education OR graduat* OR higher education OR postgraduat* OR studen* OR tertiary OR undergraduat* OR universit*) AND							
Access	Additional search items: (access OR admissio* OR application* OR intake OR recrui* OR participa*) EBSCO exclusions filters: n/a	Initial hits = 2434	1st sift = 187	2nd sift = 150	Full text access = 106		
Retention	Additional search items: (complet* OR depart* OR dro* OR graduati* OR reten* OR persi* OR withdra*) EBSCO exclusions filters: 'High school'; 'Secondary Education'; 'School Holding Power'; 'High School Students'; 'High School Graduates'; 'School Dropouts'; 'Adult Education'	Initial hits = 2484	1st sift = 177	2nd sift = 160	Full text access = 111		
Attainment	Additional search items: (attai* OR classification OR G.P.A. OR GPA OR mark* OR resul* OR outcom*) EBSCO exclusions filters: 'High school'; 'High School Students'; 'Elementary Education'; 'Middle School Students'	Initial hits = 2383	1st sift = 126	2nd sift = 105	Full text access = 73		
Progression	Additional search items: (advance* OR caree* OR destinatio* OR emplo* OR further OR job* OR opportunit* OR progres* OR prospect*) EBSCO exclusions filters: 'High school'; 'High School Students'; 'Secondary Education'; 'Adult Education'; 'Elementary Education'; 'Middle School'; 'Middle School Students'	Initial hits = 3141	1st sift = 268	2nd sift = 154	Full text access = 117		

Standards of evidence (taken from Centre for Social Mobility 2019, p 4)

Type 1: Narrative		Type 2: Empirical Enquiry (encompasses Type 1 and the following)		Type 3 Causal claims (encompasses Type 2 and the following)	
✓ Yes please	✗ No thanks	✓ Yes please	✗ No thanks	✓ Yes please	✗ No thanks
+ Coherent strategy + Approach and activities underpinned by evidence from literature or other evaluations + Shared understanding of processes involved + Reasons for activity + Clear conception of why the changes you seek to make are important + Programme reviews	+ Disjointed activities + No rationale for developing approach and activities + The model of change is not shared + Ad hoc activities + No understanding of needs of target groups + No review of evaluation	+ Clear aim of what activities seek to achieve + Select indicators or your impact + Quantitative or qualitative data – or both, 'triangulation' is good! + Pre/post data (minimum two points in time) + Analysis competently undertaken + Sharing of results and review or activity	+ Aims developed after activity + No concept of measuring success + Information not systematically collected + Only collect information once + Data not related to the intervention + Results not used to inform decisions	+ Have a target as well as a control or comparison group + Could use an experimental or quasi-experimental design + Think about selection bias and try to avoid it	+ Using groups that are not comparable + Selection bias in comparator groups

Appendix 2

The research team are extremely grateful to the support and guidance of the Student Outcomes Stakeholder Group (SOSG) who provided insight and critique during the design phase of this review.

Name	Title	Institution
Lindy Ann Blaize Alfred	Sheffield Hallam University	Senior Lecturer, Educational Developer/Development Lead
Lydia Bleasdale	University of Leeds	Associate Professor in Law Director of Community Engagement
Tamsin Bowers Brown	University of Derby	Associate Professor of Learning and Teaching And Head of Social Justice and Pedagogic Practice, Centre for Excellence in Learning and Teaching
Lucy Clague	Sheffield Hallam University	Research Fellow, SloE Research and Knowledge Exchange Centre
Michael Draper	Swansea University	Professor in Legal Education and Director of the Swansea Academy of Inclusivity and Learner Success
Andrew Harvey	LaTrobe University	Executive Director, Student Equity Director, Centre for Higher Education Equity and Diversity Research
William Hasty	University of Strathclyde	Learning Enhancement Adviser (Assessment and Feedback)
Sonia Illie	University of Cambridge	University Lecturer and Research Fellow at Hughes Hall
Charmaine Myers	Sheffield Hallam University	Principal Lecturer, Principal Lead for Employability and Curriculum Design
Katie Strudwick	University of Lincoln	Dean of the Lincoln Academy of Learning and Teaching
Dave Thomas	University of Kent	Student Success and Attainment Manager
Iwi Ugiagbe-Green	University of Leeds	Associate Professor Accounting and Finance
Alex Wardrop	Office for Students	Manager (evidence and evaluation) – Office for Students

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Access, retention, attainment and progression: an integrative review

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