

## **How Knowledge Works**

Encouraging the adoption of How Knowledge Works in  
England's education system

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## About Templeton World Charity Foundation

[Templeton World Charity Foundation \(TWCF\)](#) is an independent grant-making foundation which aims to support scientific breakthroughs and practical tools relating to the search for meaning, purpose, and truth. It supports some of the world's best minds and promotes open-minded inquiries in a wide range of fields, working with top academic institutions and leading experts from around the world.

TWCF was established by Sir John Templeton in 1996 to serve as a global philanthropic catalyst for discoveries relating to Big Questions of life and the universe, in areas of science, theology, philosophy, and human society. He established the foundation to foster rigorous scholarship and broad communications on diverse and fundamental topics, including (but not limited to) life, intelligence, complexity, creativity, infinity, and purpose, in order to stimulate curiosity, and enthusiasm for new discoveries.

## About How Knowledge Works (HKW)

Many different subjects are taught in primary and secondary schools, but how these subjects and disciplines relate to each other is seldom discussed in classrooms. While subject boundaries can reflect legitimate differences between subject methodologies and allow for focused and deep engagement with individual subjects, students are rarely prompted to reflect on these aspects of knowledge production.

As a result, students may fail to appreciate how knowledge and methods from different disciplines relate to one another. Furthermore, big questions that require reflection from multiple disciplines receive little attention in classrooms. Without the opportunity to look more broadly at how knowledge works within and across disciplines, students may develop a tacit understanding of subjects and disciplines that obscures, rather than illuminates, the relationships between them. It also leaves them ill equipped to examine issues that are inherently interdisciplinary.

To address these challenges, TWCF aims to expand teachers and students' understanding of 'How Knowledge Works' (HKW). TWCF presumes no particular definition of HKW, however it believes it is closely related to such subjects and concepts as the nature of science, philosophy of science, theory of knowledge, epistemic literacy, comparative epistemology, scientific reasoning, religious reasoning, and others.

## About the Big Questions in Classrooms initiative (BQiC)

In 2018, TWCF launched a new funding programme, known as [Big Questions in Classrooms](#). The initiative seeks to develop primary and secondary school teachers' and students' understanding and insight about HKW, particularly in the domains of science education and religious education in England. It aims to nurture students' curiosity and their appreciation of how various forms of knowledge can come together to enrich our questioning, reasoning, and learning. TWCF funded six projects in its first round of grants between September 2018 and January 2019, and three in its second round which commenced between October 2019 and January 2020. The BQiC initiative has three goals:

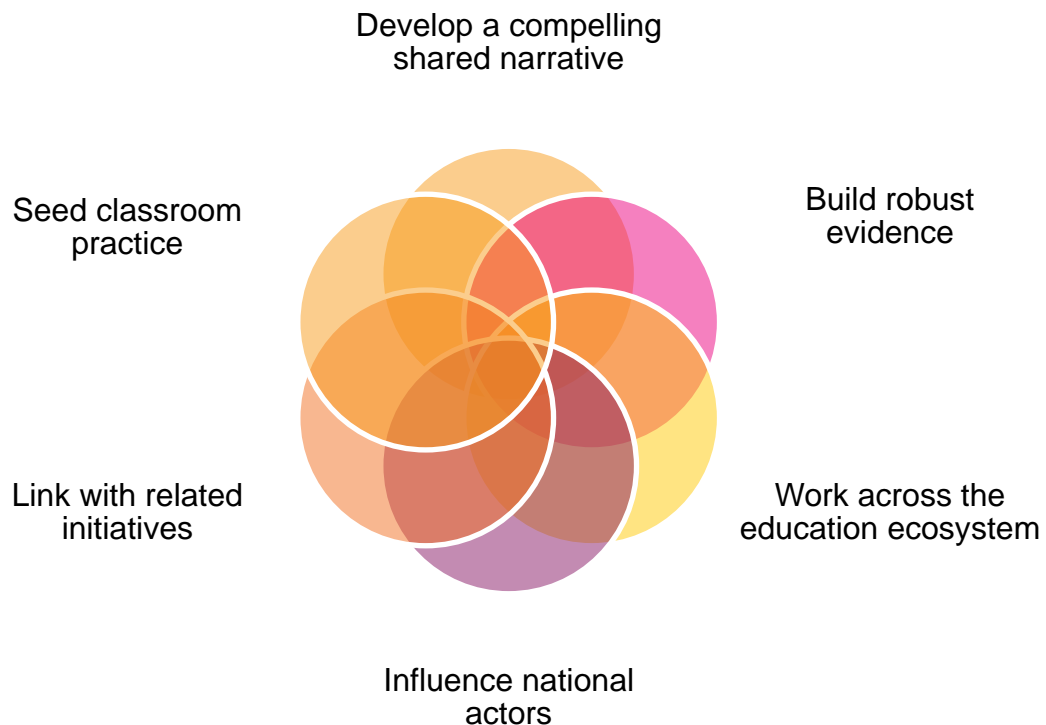
- Develop a robust research and evidence base of best practices in teaching about HKW in science and religious education;
- Provide quality and innovative training, implementation strategies and resources for teachers on HKW and interdisciplinary engagement in science education and in religious education;
- Make valuable contributions to national conversations in England about education enhancement in science, religious education, and beyond.

# Executive Summary

Translating research into policy and practice is rarely a simple process. There are multiple challenges to encouraging the adoption of 'How Knowledge Works' (HKW) approaches in England, including lack of familiarity with the terminology, the lack of an established evidence base, and the structural complexity of the education system. However, a richness of the stakeholder system around education and the increasing devolution of decision-making in England offer significant opportunities use research evidence, partnership building and stakeholder convening to leverage influence around a compelling narrative for change.

This report maps the opportunities for adopting HKW, based on qualitative research and consultation with teachers, education policy professionals and academic experts, and a literature review. We offer six key recommendations to support the uptake of HKW. It is important to note that these recommendations do not form a linear plan for action, but instead are interlinked and mutually reinforcing.

Figure 1: Recommendations to support uptake of How Knowledge Works



## 1. Develop a compelling shared narrative

HKW is not (yet) a recognised term in England's education sector. However, once the concepts behind it are explained, stakeholders are positive about its ambitions. A narrative for HKW needs to articulate the ambition and potential value of HKW. This includes: the expected outcomes for students in the short and longer term, the value for broader society and how it relates to stakeholders' existing interests, the research and development work that has already gone into HKW and its successes to date, and the future trajectory for developing HKW.

The Big Questions in Classrooms (BQiC) research programme is already generating much of the material to support this. However, involving stakeholders from the sector to develop a narrative collaboratively is likely to lead to greater buy-in and engagement. Building a shared narrative is also the first step to support the formation of a broader coalition around the adoption of HKW approaches.

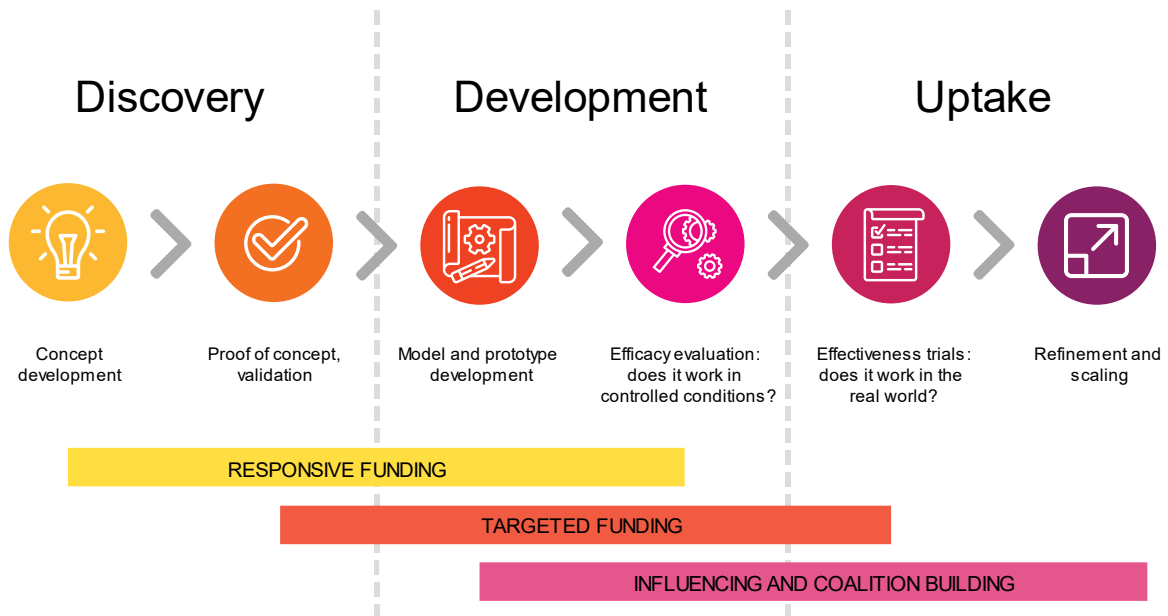
## 2. Manage the research pipeline to build robust evidence

To build a compelling narrative for HKW there needs to be clear evidence of its value. Generating a robust evidence base for HKW is an opportunity. Demand is increasing for evidence-backed initiatives, both amongst education policy communities and teaching professionals who need to make the most effective use of limited resources. A clear articulation of the value of HKW alongside robust evidence of its benefits to students is required as impact may only become apparent in the longer term. There is a risk that interventions are abandoned before their value can be realised.

The BQiC portfolio aims to generate this evidence base. It currently contains a mix of research projects spanning the discovery and early development stages shown in the diagram overleaf. This should be expected for a research field still in relatively early development. The BQiC portfolio should result in testable delivery models and provide early indications of approaches to further inform HKW approaches. The programme is too early on to produce robust evidence that demonstrates the value of HKW approaches. To realise the value of the existing BQiC projects, research on HKW needs to progress iteratively through the pipeline to build robustly evidenced and effective approaches.

TWCF should be proactive in selecting and scaling BQiC projects for larger trials and ensuring that the level of evidence generated is sufficient to demonstrate the efficacy and effectiveness of HKW interventions. This may mean adapting the funding model for future rounds, for example moving from a responsive to a more targeted approach. In practical terms this may include greater specification of project requirements, focusing on fewer, higher value research programmes, commissioning rather than grant-funding research, or working in partnership with established educational research organisations who can bring additional rigour and credibility to findings.

Figure 2: Differing funding approaches across the research pipeline



### 3. Work across the education ecosystem

*To ensure the uptake of HKW does not lose steam with any change in the government, any HKW initiative must collaborate with key stakeholders across different levels of the ecosystem, including school funders and school leadership, from the start of the initiative.*

Expert interviewee

There have been multiple reforms and attempts to reform the science and religious education curriculum and pedagogy in England. Many have failed to lead to sustained change, however the more successful offer valuable lessons for how to encourage adoption of HKW approaches. For example, 21<sup>st</sup> Century Science, which is described in more detail later in the report, shows how collaboration between funders, education researchers, an awarding body and educational publisher was successful in developing and launching a new GCSE course taken by thousands of students.

Alongside seeking to influence policy from the top down, to create resilient change it's important to build links to related initiatives and seed classroom practice from the bottom up. The timeline of major education reforms set out on page 17 of this report shows how a change of government or of individuals in influential roles can bring significant policy change or even reversal. This remains an ongoing process, with recent opposition manifestos pledging to implement significant reforms to school governance and accountability if they had won power.<sup>i</sup> To ensure that uptake of HKW is not derailed by political change, initiatives need to be firmly embedded across the system at multiple levels. This means building a cross-sectoral coalition of stakeholders, including policy actors, who can not only advocate for HKW, but are involved in shaping the development of HKW initiatives and embedding them in classroom practice.

## 4. Influence national actors

It's undoubtedly important to engage with national government, especially the Department of Education, to create greater space for HKW approaches and leverage areas of existing alignment with HKW. This is not a straightforward task. The reasons for adopting policy are complex, embedded in power relations and rarely follow linearly from research evidence.<sup>ii</sup> At the same time, evidence supporting the effectiveness of HKW is not fully mature. Focus on Covid-19 (and Brexit before that) has diverted energy away from developing education policy. It is likely that there will be a renewed focus on domestic policy post-covid, which may offer opportunities for greater engagement with HKW. We have identified two approaches TWCF could adopt to increase its ability to influence the education system at a national level.

### Partner with an established voice

Working with one or more established actors could confer credibility on HKW, gain access to expertise in policy influencing and allow TWCF to leverage existing relationships with key policy makers. Ideally this would build on a shared narrative and coalition of science and religious education stakeholders. It might include organisations in religious education like the Commission on Religious Education or the National Association of Teachers of Religious Education (NATRE). Similarly, it could include organisations concerned with science education like the learned societies, Wellcome Trust or Nuffield Foundation. Furthermore, there may be value in working with organisations focused on evidence-informed education like the Education Endowment Foundation. There may also be value in engaging with organisations representing employer groups who value the critical thinking skills that HKW can build.

### Engage with regulators and accountability processes

There is significant power exerted by accountability and assessment processes in England's education system. Ofsted, standardised assessments, and the specifications and examination materials produced by awarding bodies are powerful drivers of school curriculum and pedagogy. Following this understanding that measurement drives practice in the education system, there is a clear opportunity to develop robust assessment tools for HKW—this need not necessarily be in the form of written examination but should be able to identify evidence of HKW outcomes for teachers and students. With Ofsted taking a more active approach to assessing teaching quality through inspections,<sup>iii</sup> there is also an opportunity to drive teaching practice by developing clear criteria and methods for recognising and assessing good practice in HKW pedagogy.

## 5. Link with related initiatives and subject areas

There are clear opportunities to engage with ongoing initiatives, build on their work and build a shared roadmap for change. Initiatives like the RE Commission and Big Ideas for Religion are already working to improve religious education in schools and to widen its scope. The International Baccalaureate (IB) includes critical thinking skills, teaching a Theory of Knowledge course as part of the Diploma core, and is starting to build an evidence base for its value.<sup>iv</sup> The Education Endowment Foundation is currently funding an effectiveness trial of Philosophy for Children by NFER to test if its model of debating philosophical questions with primary students can be effectively scaled across schools.<sup>v</sup> Primary education may offer a particular opportunity for integrating interdisciplinary HKW approaches as teaching staff are already working across multiple subject areas. In considering interdisciplinarity, there is also potential to build links beyond science and religious education. Multiple interviewees identified the potential for exploring HKW approaches in history and sociology, where research methods and epistemology are already included in courses.<sup>vi</sup>

While none of these initiatives exactly mirror HKW, they share multiple features and common aims. TWCF could play a valuable role in convening and coordinating between disparate initiatives to develop a coherent shared narrative and complementary evidence base.

## 6. Seed practice in the classroom

There has been significant growth in demand for research evidence from teachers, representing an opportunity for HKW initiatives to directly influence classroom practice. However, building evidence-informed practice in teaching is not as simple as improving the supply of research, or increasing the demand for it.<sup>vii</sup> Instead, there are key factors that need to be in place so teachers are ready to critique, implement and incorporate evidence as they encounter it.<sup>viii</sup>

Teachers' use of research evidence is primarily to address the current practical challenges they face,<sup>ix</sup> including student attainment, classroom management and stretched resources. Promotion of HKW must therefore clearly articulate how it can address these needs. As previously discussed, for HKW this may require broadening the understanding of student attainment beyond scores in existing standardised assessments and encouraging teachers to triangulate both qualitative and quantitative measures when reviewing the application of its approaches.

Teachers are also unlikely to directly access, interpret and apply research to their practice. School leadership teams, peers and organisations providing Continuous Professional Development (CPD) play an important role in diffusing research and influencing its uptake,<sup>x</sup> so engaging them is key to facilitating the adoption of HKW. One model for this is the Research Schools Network run in collaboration by the Education Endowment Foundation and Institute for Effective Education.<sup>xi</sup> The network is a group of 39 schools who are funded to translate and test research evidence into practice, and then share this with peers in their local areas through events, training and teaching resources. Another opportunity may be engaging with one of the larger multi-academy trusts to pilot the translation of research evidence practice across a number of schools.



# 1. Develop a compelling shared narrative

## How Knowledge Works is an unfamiliar term for many

How Knowledge Works (HKW) is not (yet) a widely recognised term in England’s education sector. Most of the expert stakeholders and subject teachers we spoke to as part of this research were unfamiliar with the term. This posed challenges for engagement. However, once the term was explained to them, they were familiar with the underlying concepts, and related terms like ‘theory of knowledge’, epistemology, critical thinking, evaluation of sources and teaching about evidence. They could also envisage clear value for students from the greater adoption of HKW approaches in teaching.

Developing a clear and compelling narrative for HKW that communicates its umbrella of approaches, its potential benefits for students and for society is an essential cross-cutting component for many of the other recommendations in this report. However, that does not mean it should be developed first or in isolation from the other recommendations. A narrative for HKW needs to be responsive to the research findings generated by the BQIC initiative, built in consultation with stakeholders across the sector and support related initiatives to collectively influence national government.

## Research respondents saw the potential value of How Knowledge Works for students

*The value is that students will understand the strength and weaknesses of the different approaches that different subjects take... Students today lack that skill of bringing together different approaches to answer a practical question.*

**Expert interviewee**

While the current adoption of HKW approaches in school teaching is limited, interviewees did see value in it. Teachers reported that students appreciate teachers making links and exploring the connections between material they are learning in different subject areas.<sup>xii</sup> They also thought that HKW could enable students to understand the comparative strengths and weaknesses of claims made in different subject areas, and how they can combine understanding from different subjects to approach the world around them.

Expert stakeholders thought that teaching HKW could improve students’ understanding and connection with their subject. For example, in science some stakeholders were optimistic about the opportunity to move away from rote-learning of scientific knowledge to greater focus on understanding ‘*not just the methods but the excitement of scientific discovery*’. Stakeholders also hoped that, as with related initiatives for developing broader scientific literacy, HKW teaching could help students that do not study science beyond Key Stage 4 to evaluate scientific claims in everyday life.

## Respondents identified that How Knowledge Works could improve how students view their subjects

Both science and religious education stakeholders believed that adopting more integrated, cross-curricular teaching could lead to students perceiving their subjects more positively. Science stakeholders suggested that it could help to break down impressions that science is not concerned with 'real life' or is 'not for me', while religious education stakeholders suggested that teaching across subjects could challenge perceptions that some subjects are less important than others, which can be the case with religious education as it is often not formally assessed in schools and is usually given less teaching time than subjects forming part of the national curriculum.

*In education, we want students to understand the value of each individual subject. HKW can help us reach this point. It teaches students the contribution of each individual subject and stops them from thinking that some (typically like RE) are less worth bothering about.*

Expert interviewee

## Caution is needed in shaping perceptions of How Knowledge Works

*Any efforts to influence topics around social cohesion and values run the danger of being seen as political. Any new initiative must take this risk into account while designing its approach and developing its brand.*

Expert interviewee

In developing a shared narrative, it is important to be cautious about how the HKW initiative is perceived. Some of the people we contacted for interview as part of this research were concerned that HKW was seeking to include creationist teaching in science lessons or were concerned with undermining belief in knowledge derived through scientific practice. Others thought that in its exploration of societal questions HKW could be seen as advocating a particular political viewpoint. This of course is not the intention of HKW, but if this misunderstanding is not corrected it may pose a significant barrier to uptake. This misperception may be due to the current focus on HKW in science and religious education teaching in the Big Questions in Classrooms research programme. It may also be linked to broader misunderstanding of TWCF's mission and interests.

## 2. Manage the research pipeline to build robust evidence

To build a compelling narrative and promote adoption of HKW approaches across the education system there needs to be clear evidence of its value. A strong evidence base for positive student outcomes is itself a valuable tool for encouraging adoption. There is an increasing demand for evidence-backed initiatives across the education system in England—among education policy communities, school senior leadership and teachers who need to make the most effective use of limited resources. It is also particularly important to articulate and evidence the value of HKW as its benefits extend beyond narrow measures of educational attainment and may only become apparent in the longer term.

The BQIC initiative is already building the basis of this evidence. Projects and pedagogical approaches need to be supported through the research pipeline to ensure and build a robust body of evidence for their efficacy and effectiveness. Research evidence is used directly by national government and regulators when developing their policy and practice. The Department for Education's (DfE) research priorities include elements that have direct relation to HKW. The direct uptake of research by schools and teachers is discussed in the final section of this report.

### There is limited existing evidence for How Knowledge Works

*There is a dearth of evidence on the impact of How Knowledge Works... but that's what we're hoping to start addressing*

Expert interviewee

Our literature review and interviews with expert stakeholders found that there is very little evidence on the value of HKW approaches, the educational outcomes they support or their longer-term impact on students. This is not surprising as most HKW projects are at the pilot stage, but it shows there is scope for research funding to make a significant contribution to strengthening the evidence base for HKW and promoting its uptake.

There is, however, evidence of positive academic impacts for initiatives with similarities to HKW. Evidence on Philosophy For Children (P4C) suggests that it enabled children, especially the differently abled, to make four months of additional progress in reading, three months in maths and two months in writing. Key Stage 2 pupils overall made two additional months of progress in reading and maths.<sup>xiii</sup> It also positively influenced students' confidence to speak, their listening skills, and their self-esteem.

## Conventional attainment measures are insufficient for How Knowledge Works

HKWs may improve attainment in existing measures of science and religious education attainment, but that isn't its central aim or the limit of the potential benefits it offers students. Our interviewees identified several potential outcomes for students as a result of experiencing HKW initiatives including:

- Increased engagement and enjoyment of learning.
- Enhanced understanding of other disciplines.
- Increased understanding of the links between disciplines.
- Improved skills in argumentation and critical thinking.
- Greater ability to critically evaluate a claim made within a particular subject discipline.
- Greater understanding of the power and limitations of science and religion in understanding phenomena, aiding real life decisions and in informing ethical viewpoints.

Interviewees suggested that to evaluate these outcomes it is important to look beyond conventional educational attainment measures and instead use a combination of quantitative and qualitative methods. Many of these outcomes relate to the development of skills and understanding, which accrue value to students throughout their lives. Direct measurement (and attribution) of value is therefore difficult in the absence of long-term research studies, so it will be important to develop shorter term proxy indicators to identify potential impact.

## A robust evidence base is particularly important for How Knowledge Works

As one interviewee commented, '*what gets measured gets done*' is often true in England's education system. But while the insight and skills students develop through HKW teaching may deliver long-term value to individuals and broader society, its benefits may not be apparent in the short term. Many of the teachers we spoke to highlighted their concerns that investment in delivering HKW teaching would be at the expense of teaching time and resources available for more immediate needs. For our respondents, immediate needs were often the outcomes that could be directly measured through short term attainment. An inability to measure the value of HKW in the short-term risks it being perceived as a 'nice to have' or optional extra, rather than being of core importance for students, and therefore being deprioritised in the trade-off our respondents described.

One response might be to develop validated research tools that interrogate proxy indicators for the value of HKW so that teachers, and the broader accountability system, can identify the benefits and challenges of teaching HKW. However, this would put a significant burden of measurement on students, teachers, and schools. A more scalable approach might be to build a robust base of evidence that, having already evidence the value of HKW, characterises the features of good HKW teaching so that good practice can be recognised and incentivised through existing accountability approaches like peer teaching observations and school inspections.

## Research should be developed through the pipeline from discovery to uptake

The BQIC portfolio contains a mix of research projects within the discovery and early development stages shown in the research pipeline diagram overleaf. These will result in testable pedagogical models and teaching resources, along with early indications of promising approaches to provide the basis of further research. To further promote uptake of HKW, these projects need a robust evidence base. Additionally, these projects need to be supported to achieve that robust evidence base. However, this must be done thoughtfully, ensuring at each stage that research is ready to move to the next.

*Early research should focus on outcomes for teachers, since it will be a while before we can see significant shifts in outcomes for students. We need to understand if they are able to discuss big questions that cut across disciplines, in the classroom.*

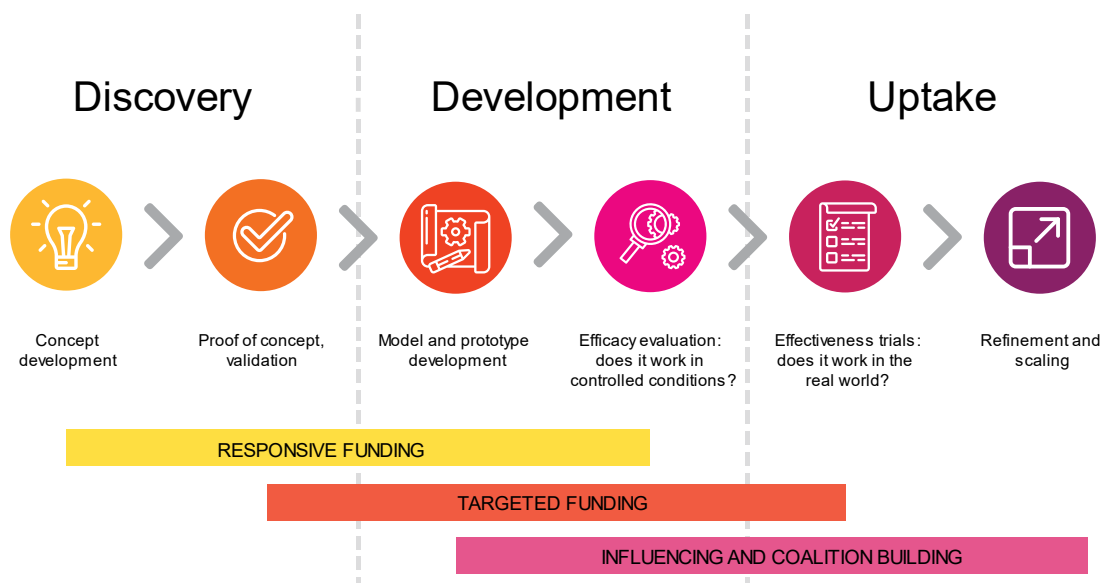
**Expert interviewee**

While there has been an increasing focus on conducting large controlled trials in education, it is important these are not undertaken before there is sufficient understanding of the approaches to be tested and outcomes to be measured to enable a robust research design. As previously discussed, HKW has the potential to lead to a wide range of positive outcomes for students over a range of different timescales and describes a broad umbrella of pedagogical approaches. Before progressing to test approaches for efficacy and effectiveness, further

formative research may be needed to identify promising methods and the key contextual factors that may promote or hinder the use of HKW approaches in the classroom. One expert stakeholder cautioned that initiatives that move to trials too early risk producing inconclusive results because they have not adequately controlled relevant contextual factors or produced meaningful data for analysis.

For TWCF this may mean adopting alternative support models at different stages in the pipeline, an approach adopted by research funders including The Bill & Melinda Gates Foundation and The Wellcome Trust. This might mean, for example, moving from a responsive to a more targeted approach to providing translational funding, narrowing later rounds to fewer, higher value research programmes, or commissioning rather than grant-funding specific trial evaluations.

Figure 3: Differing funding approaches across the research pipeline



## The growth in evidence-informed policy and practice is an opportunity for HKW

*There is increasing value placed on research and evidence in education—not just by policy makers, but by school leaders and classroom teachers.*

Expert interviewee

Over the past ten years there has been a clear growth in evidence-informed policy and practice in education.<sup>xiv</sup> This offers an opportunity for influencing the adoption of HKW approaches through the evidence generated by the BQiC programme. Demand has grown particularly in schools, where the number of research-engaged schools has grown, teaching schools are making more use of research evidence in training new teachers, and school leaders increasingly feel government policy should be strongly aligned with research evidence.<sup>xv</sup>

Expert interviewees have also commented that individual teachers have become more proactive in seeking out research evidence to inform their practice. While national governments have been criticised for appearing to selectively use evidence to support policy positions,<sup>xvi</sup> there has been a clear growth in the use of evidence for developing and setting education policy by the Department for Education (DfE) and Ofsted.

### Research priorities for the Department for Education (DfE)

The DfE cites existing research when setting policy and proactively identifies areas of research interest. The Department for Work and Pensions and the Department for Business, Energy and Industrial Strategy also sets out education research needs. These are currently focused on facilitating skills development in response to demand in the labour market.<sup>xvii</sup> Regardless, the priorities related to improving the teaching and learning of science and the quality of teaching through continuing professional development have potential for aligning with HKW approaches, and represent immediate opportunities for TWCF to engage with DfE. There may also be opportunity to influence future research areas.<sup>xviii</sup> DfE's current areas of research interest include:

- Effective approaches in different early years settings, and for pupils with different SEND (special educational needs and disability) conditions, based on insights from cognitive science and neuroscience.
- Transition between early years and primary, particularly for disadvantaged pupils.
- Improving equity by understanding geographic differences and predicting which schools might improve or deteriorate.
- Parental engagement and the barriers and drivers to parental engagement in education in the home.
- Organising schools to become more financially efficient and using technology to reduce staff workload.
- Improving staff recruitment and retention, especially in shortage subjects.
- Wellbeing of pupils and teachers, including the school's role in improving pupil mental health.
- Improving the teaching and learning of science.
- Improving the quality of teaching through staff deployment and continuing professional development.

### **Case study 1: Theory of Knowledge (TOK) in the International Baccalaureate**

Theory of Knowledge (TOK) is a mandatory component of the IB Diploma Programme—an assessed programme for students aged 16-19 taught at over 3000 schools worldwide.<sup>xix</sup> It is taught through the discussion of questions around evidence, knowledge and the application of theoretical understanding to the real world. It aims for students to gain greater awareness of personal and ideological assumptions, as well develop an appreciation of the diversity and richness of perspectives from different cultures. It is assessed through a short essay and oral presentation.

In a similar manner to some HKW approaches, TOK aims to be interdisciplinary, linking across academic subject areas. It also encourages students to reflect critically on ways of knowing and areas of knowledge while considering the role and nature of knowledge within their own cultural context and the wider world.

The IB Organisation has published multiple studies reviewing student outcomes of the TOK course, which are available through its [website](#).

### 3. Work across the education ecosystem

It is important to understand and influence the multiple actors and factors that shape how formal science and religious education are currently taught to promote the adoption of HKW approaches. In England, a legacy of multiple reforms has contributed to a complex system with power and influence distributed across multiple types of organisation. This section examines the structure and development of this system to identify where there is the greatest opportunity to create change. Learning the lessons of past initiatives, we suggest that adoption of HKW needs to be embedded across the system to be resilient in a context of continual political change.

#### Multiple policy reforms have contributed to a complex, distributed system

Over the past 30 years, the education system in England has undergone multiple waves of reform. Figure 4, overleaf, identifies the major reforms most relevant to HKW, science and religious education in this period. These reforms have often been linked to either a change in minister or government, and have tended to align with either the broader ideological position of an administration or the interests of an influential figure.

This history of continual education reform in England has shaped the underlying landscape of the education system, creating a highly fragmented and complex system with a great number and diversity of stakeholder groups, school types, governance mechanisms and influences on curriculum and pedagogy. This fragmentation has distributed power—both explicit and implicit—across multiple centres. While some powers are centralised within the DfE, others are devolved locally, and may vary for different types of schools. This means central government has less authority over what is taught than is commonly believed.

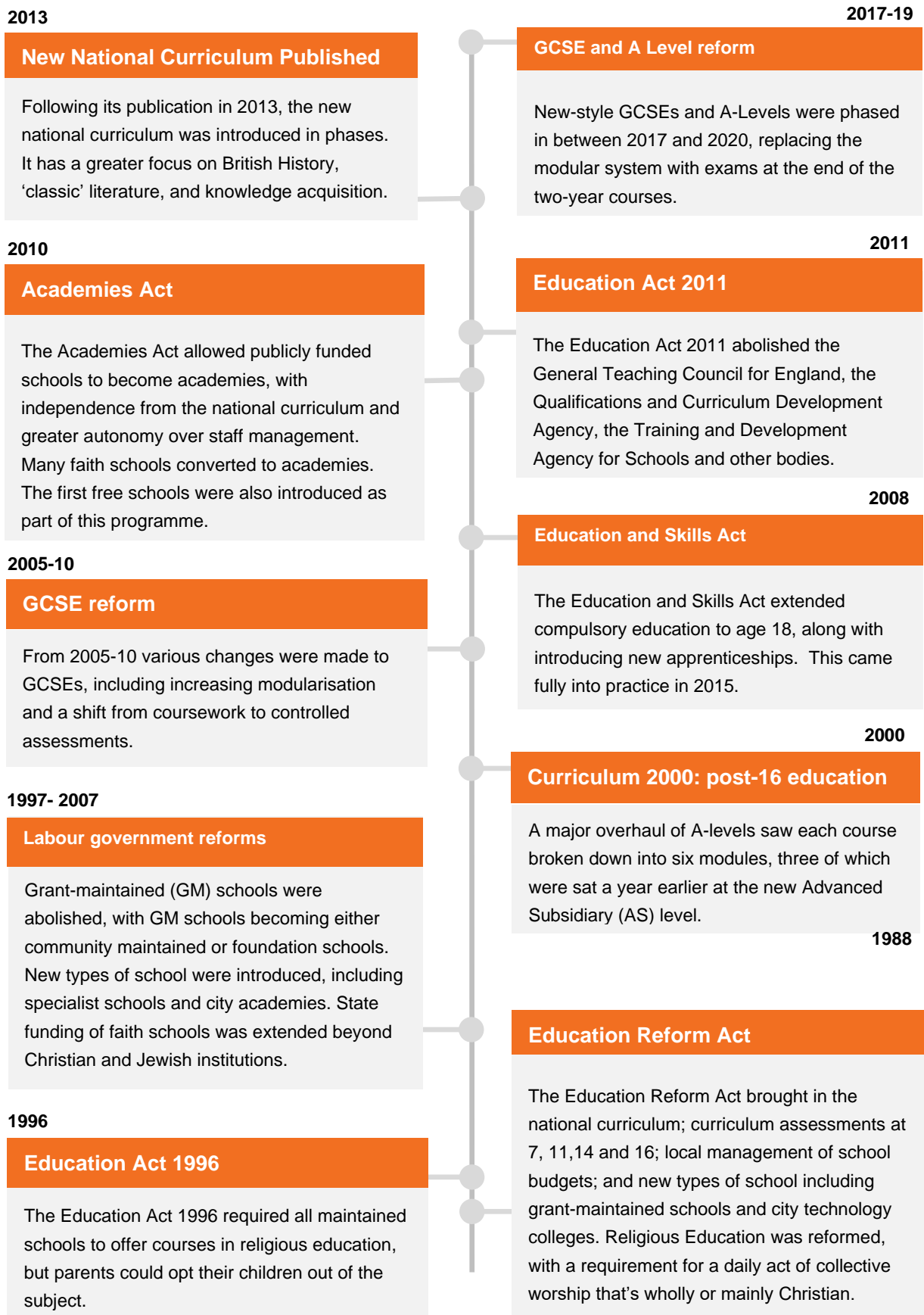
#### Policy reforms are often not driven by evidence

Some of the stakeholders we interviewed commented that policy reforms have often been made faster than they can be effectively evaluated and have been driven more by theoretical or ideological understanding than evidence. Interviewees said that this was true both at the level of national policy, but also within schools where reforms to the curriculum have required new schemes of work and lesson plans to be developed without a basis in evidence. This complicates a simple linear model of HKW uptake following development of an evidence base, instead suggesting that successful adoption of HKW will require an iterative approach that builds evidence for the value of HKW at multiple levels (including individual, school and societal).

The non-linear relationship between evidence and policy also means there may be value in engaging with policy communities now. By involving policy stakeholders with shaping the development of research evidence, they can contribute to specifying what kinds of evidence are most useful, meaningful, and powerful in driving change. A more iterative approach to influencing policy while developing evidence could mirror the successful integration of phonics in literacy teaching. Phonics was first introduced in schools through the National Literacy Strategy in 1998, but specific pedagogical approaches have continued to be tested and evaluated with reviews in 2003, 2006, further trials in 2010, a national programme rollout in 2012 and continuing evaluation by the National Foundation for Educational Research.<sup>xx</sup>



Figure 4: A timeline of education reform in England



## A great diversity of school types brings challenges for uptake

Policy reforms over the past 30 years have given England an internationally unparalleled diversification of school types,<sup>xxi</sup> contributing to a terrain which has been described as ‘messy, patchy and diverse’.<sup>xxii</sup> This provides multiple challenges for the uptake of HKW, including increased complexity in the system, increased variation of school structures and increasing divergence of teaching practice across different institutions. However, it also offers opportunities for localised change due to increased devolution of curriculum decision making.

Mapping and understanding this terrain, let alone influencing it, is difficult as new types of provision are constantly emerging. While this report groups schools into three broad categories—-independent, community and academies—there are actually between 70 and 90 different school types in England.<sup>xxiii</sup> The ongoing expansion of the academies programme has transformed what was previously a national system of schools operated under a single legal model (with minor variations) to a highly fragmented and opaque system.

Even within a single category of school there can be huge variation in terms of governance, curriculum and management. The flexibility of the legal framework of the academy has enabled this type to become the template for a range of sub-types, including studio schools, free schools and University Technical Colleges (UTCs).<sup>xxiv</sup> Education researchers have argued that there is no longer a school system in England, but instead ‘increasingly fragmented local landscapes of schooling with different patterns emerging in different parts of the country’.<sup>xxv</sup>

## A complex system offers opportunities and challenges

Education in England is a complex system with many actors involved in shaping curriculum and pedagogy. The system map overleaf provides a high-level description of the system, locating key actors and the interconnections between them. It was developed through our literature review and interviews, with refinements from a stakeholder workshop. The size of each circle representing each actor corresponds to the number of connections it has with other actors. While this report focuses on education in England, it is worth noting that this mapping would differ significantly across the four nations.

There is no simple or linear model of uptake for educational research. Overall, the system map shows a complex route between research outputs on the left, and teaching practice on the right, with many mediating stakeholders in between. The number of actors and interconnections within the system also increases the complexity of working within it. Greater complexity and interconnectedness can increase its resistance to change, but also offers more potential points for intervention and more opportunities to form alliances than in a simpler, more centrally controlled system.

The expert stakeholders we consulted identified significant influence in areas of the system that might be expected—including DfE and Ofsted—but also highlighted the importance of school leadership teams, peer influence and the transmission of traditions of practice on teaching pedagogy. School leaders were identified as important mediators of multiple relationships between teachers and the broader system.

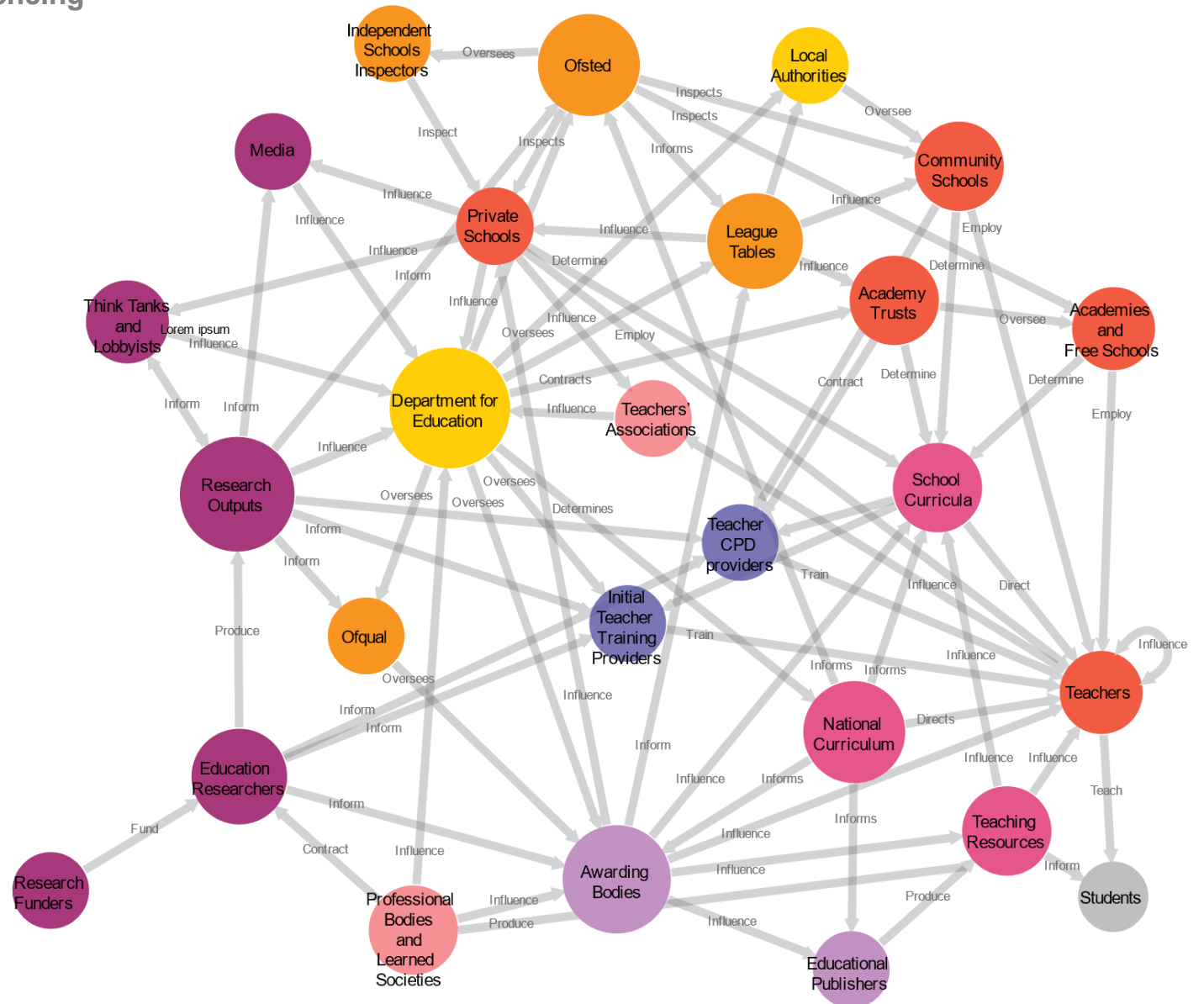
Stakeholders also identified differences between science and religious education. In science education, they identified professional bodies and learned societies as having significant influence, while in religious education they suggested teacher member groups have a greater role in sharing practice within teacher communities. One interviewee also highlighted that religious organisations can be partisan and may be resistant to any change that reduces the amount of teaching time allocated to their particular faith. Finally, stakeholders identified that if employers articulated a need for greater critical thinking skills in the workforce, this would support a case for HKW with national government.

## An overview of the actors influencing England's education system

Figure 5: A map of the education system

### Key

- Research and media
- Schools and teachers
- Teacher training
- Accountability and regulation
- Government
- Professional bodies, learned societies and teachers' associations



## 4. Influence national actors

Engaging with national government and regulators is important for influencing the adoption of HKW. The most recent revisions to the national curriculum have reduced the space for teachers to adopt HKW approaches. Furthermore, the continued status of religious education being outside the national curriculum makes it difficult to influence through central policy and reduces its perceived importance in schools. However, the process of translating research evidence into national policy in any field is complex, dependent on multiple actors, existing political ideologies and systems of power relations. It rarely follows directly from the creation of research evidence.<sup>xxvi</sup>

TWCF could have greatest influence by partnering with an established voice in the field to leverage existing relationships with policy makers. The following section identifies several initiatives related to HKW that it may be valuable to coordinate with. Some organisations concerned with improving science and religious education in England are listed in the Appendix. Several research respondents also highlighted the potential value of engaging with employer or industry groups who would value the transferable skills that HKW builds.

While several stakeholders suggested that the national curriculum has declining direct influence due to the conversion of an increasing number of schools to academies, there was broad agreement that the regulator Ofsted, school accountability measures and league tables have significant power. As one interviewee commented: *'what gets measured gets done'*, suggesting a clear opportunity to develop robust assessment for student and teacher outcomes related to HKW. Ofsted's new inspection framework, and adoption of a more active approach to assessing teaching quality through inspections,<sup>xxvii</sup> also offers an opportunity to influence teaching practice by developing tools to recognise and assess best practice in HKW pedagogy.

### National government and the national curriculum

#### The national curriculum has declining direct influence

The national curriculum is a programme of study set by central government in England, although it has been described as neither national nor a curriculum as it does not apply to all schools and primarily addresses only maths, English and science.<sup>xxviii</sup> In England, pupils in community schools follow a national curriculum across most subjects up to age 14, after which they study towards external examinations (GCSEs at age 16 and A levels at age 18). The criteria for these external examinations are set by government but assessments and teaching specifications are provided by awarding organisations based on a free-market model.

Schools and colleges that have become academies do not have to follow the national curriculum although many continue to do so. This is partly due to the reflection of the curriculum in standardised assessment, which, as discussed in the following section, is a key driver of practice in schools. While the national curriculum remains important, its direct influence on school curricula is declining as around 70% of English secondary schools are now academies with a growing percentage of primary schools following suit. This proportion is set to grow as the government has previously committed to every school becoming an academy.

Although Ofsted does not prescribe that schools teach the national curriculum, its new Ofsted framework has a heavy emphasis on making sure that children have a broad and balanced curriculum. This may mean that schools pay more attention to the national curriculum than they have in the past.

## Recent reforms have reduced the space for HKW teaching

The most recent reforms of the national curriculum and GCSE and A-Level assessments have placed greater emphasis on the learning of facts over the development of skills or understanding as part of a move to a 'knowledge-based' curriculum.<sup>xxxix</sup> These reforms have increased the volume of content across all subject areas, with each individual subject covering an increased number of topics.<sup>xxx</sup> The increased pressure on classroom time from curriculum content expansion has already resulted in many schools increasing the teaching of GCSE science courses from two to three years.<sup>xxxi</sup>

This is a challenge for the adoption of HKW approaches as the large amount of material to cover within the fixed number of hours for delivery of material may result in teachers privileging rote learning of descriptive knowledge to satisfy assessment requirements, over critical examination and argumentation. Some interviewees felt that curriculum reform has already reduced the use of teaching practices that align with HKW—not only through reducing the time available for developing critical enquiry, but also by defining subject areas as discrete domains of knowledge in competition for classroom time rather than as complementary parts of a holistic education. However, this may change with the new Ofsted framework, where the Quality of Education mark prioritises a broad and balanced curriculum.

*A lot of change and turbulence in science education has meant that those trying to reform the syllabus are focussing much more on the 'big problems' and trying to create some consistency, rather than on more 'niche' topics like HKW.*

Expert interviewee

In our interviews with teaching professionals and continual professional development (CPD) providers, many interviewees noted that repeated reforms have led to a degree of weariness at the school level in response to the introduction of new initiatives. As the timeline on page 17 shows, following the phased introduction of the new national curriculum from 2013, there has been major reform of GCSE and A-Level programmes. However, several interviewees felt optimistic that this was improving, citing a reduction in the rate of centrally-mandated change and hope that the new Ofsted Inspection Framework will create opportunities for teachers to focus on pedagogy as well as content. The new Ofsted Framework emphasises a school's intent in its curriculum planning, and what the cross-school ambition for the curriculum is. Taking a longer view of education policy also suggests that while there is limited immediate appetite for curriculum revision, there will be continuing revisions of central education policy and curriculum in the future.

## Science and religious education have different status in the national curriculum

While the local determination of religious education is a barrier to effecting change at scale, it represents an opportunity for smaller scale trials of HKW approaches. Religious education was not considered in the 2013 national curriculum review and remains outside of the national curriculum—though it is a statutory requirement for schools to teach religious education. Instead religious education curricula for community schools are determined locally by a Standing Advisory Council on Religious Education (SACRE), which is responsible for producing the locally agreed syllabus for religious education.<sup>xxxii</sup> There are over 150 of these agreed syllabuses, which presents a key challenge for influencing universal adoption of HKW approaches into religious education. Research respondents also stated that they felt religious education's lack of inclusion in the national curriculum contributes to it being perceived as unimportant compared to curriculum subjects, resulting in a lack of investment and teaching time.

In contrast, science is part of the national curriculum and was addressed by the 2013 revision. The current science curriculum articulates ambitions in line with HKW, however, as previously discussed, the science

curriculum aims to be primarily knowledge-based, which has often been at the expense of more skills-based approaches like HKW.

## Regulators and accountability measures

### School accountability measures are a significant shaper of teaching practice

Schools in England are held to account for their performance through a series of measures and through independent inspections which are conducted by Ofsted, or, in the case of private schools, by an independent inspector regulated by Ofsted. The assessment and ranking of school performance through league tables is strongly tied to the results of standardised assessments, largely administered through written exams. The table below sets out the current programme of standardised assessment in English schools in relation to the five 'Key Stages' of education in England.

Figure 6: School accountability measures

Education level	Key Stage	Student Age	Assessment
Primary	1	5 to 7 years old	
	2	7 to 11 years old	Standardised Assessment Tests (SATs)
Secondary	3	11 to 14 years old	Standardised Assessment Tests (SATs)
	4	14 to 16 years old	GCSE (or equivalent)
	5	16 to 18 years old	A-Level or International Baccalaureate

Over the past two decades, the role of Ofsted in judging schools has become more significant as the parent choice in selecting schools is promoted. Poorly performing schools may be sanctioned by being placed in 'special measures', which entails a frequent programme of inspection and may result in the dismissal of staff or governors. Individual teachers whose students have poor test results may also be sanctioned through 'capability procedures', which are a set of performance management processes that can lead to dismissal.<sup>xxxiii</sup> Performance in school assessment has therefore become a significant influence on practice in schools. This ranges from the structuring of schemes of work and lesson plans, to the often-criticised practice of 'teaching to the test',<sup>xxxiv</sup> which the UK has been described as the worst in the world for.<sup>xxxv</sup>

These pressures offer a challenge to HKW adoption as exams primarily evaluate knowledge-based learning. This incentivises memorising information which can be recalled in an exam context, over developing skills in critical inquiry or discussion which are not assessed. However, these pressures could also offer an opportunity to leverage the power of assessment if, as one interviewee suggested, meaningful measures for the success of HKW approaches were developed.

### Primary performance indicators have a significant effect on curriculum

Both science and religious education teaching are adversely affected by primary level performance indicators. At primary level, school performance is measured through examination of pupils leaving school at the end of Key Stage 2 (for children aged 10 or 11). There are two assessments, in English and in mathematics. The focus of these examinations has a significant impact on the rest of the curriculum in schools. Typically, schools will spend over 50% of teaching time focusing on English and mathematics. All other subjects, including art, history, science,

religious education, computing, geography, languages, physical education and music, are taught in the remaining time.

This has led to particular concern among the science community that, despite science being categorised as a core subject, many primary schools are spending less time on it than prior to 2010, when it was also assessed with an end of Key Stage 2 SATs examination. Anecdotal evidence from our interviewees suggests that some

*Since religious education is not included in the English Baccalaureate, there has been a decline in students studying religion.*

Expert interviewee

primary schools are providing only one hour of science teaching a week or, in some cases, compressing all science into a science week once or twice a year. Despite this, few in the science community support a return to including science in Key Stage 2 SATs as this was seen to limit science teaching to serving the requirements of the examination.

### Secondary performance indicators have contributed to a decline in religious education

Attainment of pupils in GCSEs and equivalent vocational qualifications at Key Stage 4 is a key performance indicator for secondary schools. The measure has historically been the number of students achieving five or more GCSEs, which include maths and English with passes at A\* to C grade (now grade 5+). This has now been updated to become the English Baccalaureate (EBacc) by adding a requirement for the courses studied to include English, maths, combined science (equivalent to two courses), a foreign language and history or geography. There is no requirement for religious study in the English Baccalaureate, which expert interviewees argued has been a key contributor to the decline in students studying religion at Key Stage 4 by positioning it as a *'second tier subject'*.

Schools' need to satisfy multiple performance indicators can further reduce the space for adoption of HKW. In 2016, an additional set of measures was introduced, known as Attainment 8 and Progress 8, that require schools to demonstrate students' attainment and progress in a group of eight subjects, consisting of English and maths, three additional EBacc subjects and three other subjects of the individual's choosing. In many cases, pressure on schools to achieve these new measures alongside the EBacc measure is creating the unintended consequence of schools limiting students' options to EBacc subjects only. This is likely to have contributed to the ongoing decline in students studying religious education at Key Stage 4, where there has been a total decline of 42.6% across full and short course GCSEs from a peak of over 461,000 students in 2011.<sup>xxxvi</sup>

### Ofsted's new Education Inspection Framework offers potential for encouraging HKW adoption

Ofsted has implemented a new framework for school inspections from September 2019.<sup>xxxvii</sup> This framework includes an increased focus on the curriculum taught in schools, and its intent, implementation and impact. This is pushing schools to think about the subjects they offer, the topics they cover and the pedagogy they employ. It is also encouraging the religious education community to think more carefully about its work. This may create an opportunity for encouraging the adoption of new pedagogical approaches as schools and teachers are likely to welcome any initiative that provides them guidance to perform better during inspection. The focus on intent—the planning of the curriculum—should lead to greater links between different concepts within and between subjects. It also means that teachers should be spending more time thinking about how the blocks of knowledge fit together, which should help promote HKW.

### **Case study 2: Twenty First Century Science**

Twenty First Century Science was an innovative approach to the science curriculum studied by students aged 14-16. It built on the recommendations of the Beyond 2000 report, published by Robin Millar and Jonathan Osborne in 1998, which emphasised the importance of students developing understanding of how scientists work and the interaction of science and broader society.

Twenty First Century Science comprised a suite of GCSE courses and associated teaching and learning materials. The GCSE courses aimed to develop scientific literacy for all students by addressing the big questions that affect everyday life. This was delivered through a concept-led teaching approach, integrating 'How Science Works' throughout its curriculum and assessment. It has been available nationwide since September 2006 and over 12,000 students in 78 schools have followed the course

Twenty First Century Science was developed as a joint project between the University of York, the awarding body OCR and the Nuffield Foundation Curriculum Programme, with funding from the Nuffield Foundation, Wellcome and the Salters' Institute and teaching resources published by Oxford University Press.



## 5. Build links with related initiatives

There are clear opportunities for HKW to engage with related initiatives, learn from their work and present a stronger collective voice when seeking to influence national policy. There are multiple initiatives seeking to improve religious education and widen its scope that could align with HKW, including the RE Commission and Big Ideas for Religion. The potential value of critical thinking and debating philosophical questions has been identified by the International Baccalaureate's Theory of Knowledge course and the Philosophy for Children initiative, both of which are being evaluated for their effectiveness across schools.<sup>xxxviii xxxix</sup> There is also potential to bolster the case for adoption of HKW by considering subject areas beyond science and religious education. This could help to build a broader pool of evidence and larger coalition for change, while also addressing the risk to the perception of HKW detracting from science education identified earlier in this report.

### There are multiple initiatives seeking to improve religious education

Multiple efforts are being made towards improving the quality of religious education that align with HKW and there is potential to leverage this enthusiasm to influence uptake of teaching approaches related to HKW. For example, the latest report of the Commission on Religious Education (CoRE) recommends that students should be taught to understand sources of the information they receive and to consider how their world views impact the world views and actions of others.<sup>xi</sup> CoRE advocates redefining religious education as 'Religion and World views', and

*The Commission on Religious Education are trying to improve the quality of religious education in England.*

**Religious education professional**

increasing its scope to include broader religious and non-religious worldviews and social changes in England and elsewhere globally. It argues that this subject should be a required part of the national curriculum, and subject to inspection. It also argues that there needs to be sustained investment in professional development for religious education teachers to build a multidisciplinary approach to understanding worldviews.

The initiative 'Big ideas for Religious Education'<sup>xii</sup> also aims to improve teaching practice in religious education (see case study 3). It proposes that religious education should be organised around what is important for a young person to learn, teaching students to examine religious beliefs and practices from a range of different perspectives. Linked to these specific initiatives, several of the expert stakeholders we interviewed described a growing movement for adopting a multidisciplinary approach to religious education. Adopting a multidisciplinary approach would mean religious education being taught through a combination of approaches drawn from social sciences, history, theology and philosophy, strengthening links to academic research on religion and developing students' abilities to hold balanced and well-informed conversations about knowledge and belief.<sup>xiii</sup> This chimes with CoRE's recommendation that students should be taught "the different ways in which religion and worldviews can be understood, interpreted and studied, including through a wide range of academic disciplines",<sup>xiiii</sup> a recommendation which aligns strongly with HKW.

## Related programmes are building evidence around critical thinking and debating big questions

By building links with research programmes investigating approaches in broad alignment with HKW, there is the opportunity for TWCF to leverage a larger pool of evidence and connect efforts to influence actors in the education ecosystem. In our interviews, expert stakeholders frequently highlighted research related to the International Baccalaureate's Theory of Knowledge programme (see case study 1) and Philosophy for Children (see case study 4).

Multiple interviewees also identified the potential for exploring HKW approaches in additional subject areas. In history learning about the evaluation of sources and construction of historical knowledge is specified in the national curriculum. And in sociology, research methods and epistemology are already included in Key Stage 4 and 5 qualifications—for example both AQA and OCR A Level Sociology courses include modules exploring the role of religious and scientific belief in society.<sup>xliv</sup> Interviewees suggested that there may be existing relevant research evidence in other subject areas and that the potential of integrating cross-disciplinary teaching about HKW into multiple subjects might present a more compelling argument for uptake than limiting it to science and religious education.

### Case study 3: Big ideas for religious education

In 2017, the University of Exeter published 'Big Ideas for Religious Education'. The report is the outcome of a year's work by twelve leading academics and advisers working with teachers in the South West. It proposes a radical but simplified approach to planning the RE curriculum, and to assessment without the Qualifications and Curriculum Development Agency's eight level scale that prescribes skills students need to acquire at each level.

The report recommends organising the RE curriculum around six 'big ideas' that pupils will learn about in increasing depth at different ages and which can be explored with cross-religious (and non-religious) ideas:

**Continuity, change and diversity:** there is an amazing variety of religions, non-religious worldviews and ways of life in the world, each being characterised by continuity and change, and internal consistency and diversity

**Words and beyond:** people use both verbal and non-verbal forms of communication, literal and figurative, to express beliefs, values, experiences and identities

**A good life:** there are many ways in which religious and non-religious worldviews provide guidance on how to be a good person and live a good life

**Making sense of life's experiences:** religions and worldviews are about experience as much as belief, and they can help individuals interpret their experiences

**Influence, community, culture and power:** religious and non-religious worldviews interact with the wider communities and cultures, affecting and affected by politics, artistic and cultural life, social values and traditional rituals, sometimes having considerable power and influence beyond their own adherents

**The big picture:** religious and non-religious worldviews that provide coherent overall accounts, 'grand narratives', of the nature of reality

## 6. Seed practice in the classroom

Educational reforms have greater resilience when embedded across a system. This suggests that promoting the adoption of HKW by teachers is as important as attempting to influence change through national curriculum, assessment or accountability measures. Teachers' primary motivation for seeking research evidence is to address immediate practical challenges, including student attainment, classroom management and stretched resources.<sup>xlv</sup>

This has clear implications for how the value of HKW is articulated and how teachers understand success when trialling new pedagogical approaches—one interview cautioned that teachers will rapidly discard interventions if positive results are not observed quickly. However, building evidence-informed practice in teaching is not as simple as improving the supply of research, or increasing the demand for it.<sup>xlvi</sup> Workload pressures can present a significant barrier to teachers engaging with research and school leadership teams are essential in creating the space for professional development and research uptake.<sup>xlvii</sup> Research respondents also highlighted that much of the transmission of teaching practice is peer to peer, and consideration of teachers' informal learning is as important as influencing formal professional development.

As discussed earlier in this report there is a great diversity of school types in England, and these offer differing routes and levels of challenge for the adoption of HKW. There may be greater potential for directly seeding the adoption of HKW into classroom practice in areas where national government is currently less prescriptive and there is greater devolution of decision making in curriculum. These include academy schools who have local control over their curriculum and religious education teaching.

### Teachers seek research to address practical challenges

*There is a significant shortage of specialist science teachers. Therefore, it will be critical for any new initiative to help them do their jobs better without adding to their burden.*

Expert interviewee

Teachers' use of research evidence is largely prompted by the need to solve a practical problem, and tends to be drawing on research evidence to integrate and trial new approaches in their own practice rather than directly applying recommendations.<sup>xlviii</sup> In 2018, the Royal Society conducted research with teachers and other education practitioners to identify their priorities for research.<sup>xlix</sup> The research areas identified as valuable by teachers were:

- Behaviour: improving pupil engagement and minimising disruptive behaviour.
- Character and essential skills: building attitudes, skills and behaviours that support children's learning and personal development.
- Developing effective learners: supporting pupils to become effective and self-motivated learners.
- Enrichment: extending learning beyond traditional academic priorities, including careers education, and participation in the arts and sports.
- Feedback and monitoring pupil progress: using assessment to understand pupils' strengths, weaknesses and progress, and addressing these through feedback.

- Language and literacy: evidence on literacy from the EEF’s Teaching and Learning Toolkit (which summarises international evidence on teaching) alongside the findings from recent EEF projects.
- Mathematics: improving the teaching and learning of mathematics.
- Organising the school: addressing school-level structural and organisational issues, such as timetabling, class size, the built environment, and digital technology.
- Parental engagement: helping parents to support their children’s learning.

These research priorities don’t overtly include the language of HKW, which is unsurprising—as discussed earlier in this report, there is currently relatively low awareness of HKW. However, many of these areas have clear crossover with HKW, especially character and essential skills development, developing effective learners and extending learning beyond traditional academic priorities. This indicates a clear opportunity to engage teachers with guidance drawing from HKW if it is framed within the language of teachers’ existing needs.

## School leadership, peer communities and professional development providers are important for translating research

*If teachers are overloaded with work, it can be really difficult to get them to participate in continuous professional development.*

Expert interviewee

Teachers value research evidence, but most teachers do not feel confident engaging with research directly or able to judge its quality—preferring to rely on senior school leaders or organisations like the Education Endowment Foundation to interpret findings.<sup>i</sup> Workload pressures can also be a significant limiter to teachers’ ability to directly review and implement research findings and can reduce their motivation and ability to engage with professional development.

The expert stakeholders we consulted emphasised the critical importance of school leadership teams in translating research, shaping pedagogical practice within schools and creating space in workload models for teachers to learn, test and implement new approaches.

Research respondents also drew attention to the role of community tradition in influencing classroom practice. Highlighting that the majority of learning about how to teach happens between teachers—through initial teacher training placements, mentoring, peer observation and shared schemes of work and lesson plans—they suggested that adoption of teaching pedagogy in alignment with HKW could be greatly accelerated by influencing at this level through the promotion of shareable resources and work with professional bodies.

## Religious education offers potential for direct adoption of HKW

### Religious education is a legal requirement but not part of the national curriculum

All maintained schools must teach religious studies.<sup>ii</sup> Academies and free schools are contractually required through the terms of their funding agreement to teach the subject. Religious education must be included in the curriculum for all registered pupils, including all pupils in reception classes and sixth form; but excluding nursery schools or nursery classes in primary schools, people aged nineteen or above for whom further education is being provided at school, and people over compulsory school age who are receiving part-time education.

Although all maintained schools must teach religious studies, religious education is not part of the national curriculum. Religious education does have a non-statutory teaching framework that states that religious education should teach pupils about religion and promote pupils' spiritual, moral, social, and cultural development, and prepare all pupils for the opportunities, responsibilities, and experiences of life.<sup>lii</sup> This preparation includes the development of skills of application, interpretation and evaluation of, and critical enquiry with, what they learn. The framework also includes the philosophy of religion and recommends that students consider how science and religion relate.<sup>liii</sup>

## There is appetite and opportunity for change in religious education

*A clear approach [to encourage HKW adoption] would be to provide guidance to religious education teachers and build their capacity to do their jobs better and meet the changing requirements of the subject.*

Religious education practitioner

As previously discussed, religious education is not part of the national curriculum, it does not form part of school accountability measures, relatively few students take formal qualifications, and locally agreed syllabuses vary in their degree of prescription. As a result, respondents told us that the practice and quality of religious education can vary greatly between schools.

*Teachers should encourage students to question where religious knowledge comes from, but this does not happen.*

Religious education professional

Some interviewees identified these factors as challenges facing religious education in England because they represent a lack of value placed in the subject. However, the lack of prescription and examination also means there are fewer barriers to the direct adoption of HKW approaches.

While there is some use of HKW approaches in religious education in schools in England, experts disagree on how consistently these are used. One respondent felt that many religious education teachers already incorporate elements of HKW approaches in their practice, but that this is currently more linked to individual understandings of the role of the subject and the student outcomes it should seek to deliver. Others thought that the use of HKW in religious education is patchy, that religious education largely focuses on teaching facts about religious practice and not on addressing bigger questions of how knowledge is created, understood and debated in religious traditions. Finally, some respondents suggested that integrating more cross-disciplinary teaching in religious education could help to increase its perceived value within schools by showing its relevance to learning across curriculum subjects.

## Different school types offer different routes for adoption of HKW pedagogy

### Community schools follow the national curriculum

Community schools, which are sometimes called local authority maintained schools, are state-funded schools where a local education authority (LEA) employs the school's staff, is responsible for the school's admissions and owns the school estate. This was the largest single category of schools but is decreasing as more schools convert to academy status, with the majority of secondary schools now academies. Community schools follow the national curriculum when developing local curricula, and so would be directly influenced by any revisions of its content. As the majority of primary schools in England remain community schools, this is particularly relevant to developing HKW approaches in primary contexts.

## Academies have more freedom in determining curriculum

Academies are publicly funded independent schools with a greater degree of freedom from state control than maintained schools. In contrast to maintained schools, which are controlled by local authorities, academies are owned and run by not-for-profit trusts. Around a third of schools in England are now academies, around 70% of secondary schools and 20% of primary schools.<sup>iv</sup>

Academies' autonomy has been described as often more rhetorically than actually meaningful,<sup>lv</sup> but academies do have freedom in determining curriculum, pupil admissions policy, and staff pay, working conditions and qualifications. These freedoms are governed by contract law—each contract is between an academy trust, which may include multiple schools, and the DfE. The existence of individual contractual agreements between academy trusts and DfE means that it is increasingly difficult to effect national change from central government through prescriptive policy.<sup>lvi</sup> This fragmentation is currently a significant barrier to centrally mandating curriculum change, which would prove a barrier if attempting to influence adoption of HKW solely through central policy.<sup>lvii</sup> However, it also means that academies have greater ability to effect local change, and so may be able to adopt HKW pedagogy more quickly than would be possible through centrally mandated change.

## Multi-Academy Trusts and umbrella trusts may offer opportunities for trialling approaches

The academy model allows for great variation in the types of schools and their governance structures. Some academy trusts run a single school under contract, others run multiple schools (as a Multi-Academy Trust or MAT) under a single contract. Over 70% of academies are run as part of a MAT.<sup>lviii</sup> Some trusts, including MATs, have further grouped themselves under 'umbrella trusts' and some have entered collaborative partnerships with other trusts. There may also be links between trusts which share a common sponsoring organisation but are otherwise independently contracted.

This complexity would greatly complicate any attempt to introduce HKW from the top down – even working out what the governance arrangements for a particular school are can be challenging. However larger umbrellas and MATs may offer opportunities to engage with multiple schools in relation to HKW. These are a minority, with most MATs comprising between 2 and 10 schools,<sup>lix</sup> but could offer a useful testbed for developing early evidence around HKW pedagogy and content.

## Free schools have even greater variation

Free schools are a form of academy and have similar independence from local authority control. They can be established by sponsors such as businesses, universities, other schools, faith groups or voluntary groups. Many key governance features vary from school to school, between maintained schools and academies, and between academies, depending, in part on the timing and circumstances of their creation. Like academies, free schools diversity and independence makes them difficult to influence via national policy, but they may offer local opportunities for developing and trialling HKW initiatives.

There are also specific subsets of free schools. University Technical Colleges (UTCs) specialise in subjects like engineering and construction. Their specialised curricula are designed by the sponsoring university and employers, who also provide work experience for students. Studio schools are small schools (usually with around 300 pupils) teaching mainstream qualifications through project-based learning. Students work with local employers and a personal coach, and follow a curriculum designed to give them the skills and qualifications they need in work, or to take up further education.

## Private schools have significant influence on the wider education system

Private schools (also known as independent schools) charge students fees to attend instead of being funded by the government. For non-boarding pupils, fees can range from £5,000 to over £21,000 per year, and costs are significantly higher for boarding pupils. Private schools don't have to follow the national curriculum, offering

potential for the direct adoption of HKW initiatives, however they must be registered with the government and inspected regularly by Ofsted or an approved body regulated by Ofsted. There is an uneven geographic distribution, with most located in the south east of England.<sup>lx</sup>

While the private education sector is relatively small in England—around 7% of children are taught in independent, fee-paying schools<sup>lxi</sup>—it has a powerful influence in shaping education in England. This is partly through the direct lobbying of members' groups but also by forming the personal educational experience of the professional and political classes who set education policy—the privately educated 7% took 39.4% of Cambridge and 42.8% of Oxford places in 2013.<sup>lxii</sup> Private schools also interact directly with the state-funded sector—over

*Despite educating a minority of students, private schools have significant influence in England's education system by forming standards and norms of practice*

Expert interviewee

1,100 partnerships with state schools were recorded by the 2019 ISC census<sup>lxiii</sup>—where they may offer access to facilities, teaching secondments or specific opportunities to students. With their greater independence over curriculum and pedagogy, and their magnified influence, private schools may represent an opportunity for developing HKW practice and influencing its uptake.

#### Case study 4: Philosophy for Children

'Philosophy for Children' (P4C) is a whole-school approach to learning and teaching which aims to improve children's reasoning, social skills, and overall academic performance. The programme consists of a one-hour session each week, facilitated by the classroom teacher, in which children discuss an interesting philosophical question. Example questions might be 'Is it fair to have a winner?' or 'Is it ok for children to hit teddy bears?' The teacher encourages children to take a clear position, justify it, and respond to each other's contributions. The project does not aim to teach children philosophy; instead it equips them to 'do' philosophy for themselves.

A major part of the programme is showing teachers how to generate good discussion with and between children – a skill that is likely to improve their teaching across the board. Through handbooks and training (two days initially, with the option for extensive follow up), teachers are shown how to structure a good conversation between children, how to ask effective open-ended questions, and how to prompt children to think more deeply about their positions.

Philosophy for Children has now been adopted by schools in over 60 countries as a way of developing children's higher order thinking skills. The Education Endowment Foundation funded this project to find out whether the approach could improve attainment for pupils in English primary schools. SAPERE provides guidance on how to integrate with it in the national curriculum.

# Conclusion

Encouraging the adoption of a new approach to teaching in England is not a simple task. However, while the complexity of England's education system offers multiple challenges, it also offers multiple routes to adoption and opportunities to engage a wide community of stakeholders.

This report analyses the landscape of education in England, drawing from consultation with teachers, education researchers and policy communities, along with a review of academic and grey literature. From this it outlines six recommendations to support the adoption of How Knowledge Works:

## **1. Develop a compelling shared narrative:**

While the teachers, policy professionals and researchers we interviewed were largely unfamiliar with the term How Knowledge Works, or the concept of building epistemic insight through interdisciplinary teaching, they were strongly positive about its ambitions. Building a shared narrative for HKW offers the opportunity for better adoption of HKW concepts and allows stakeholders to engage as part of a collective endeavour.

## **2. Manage the research pipeline to build robust evidence:**

There is a growing appetite for evidence-based approaches amongst teachers and education policy communities. And the BQIC programme is already developing an emergent evidence base for HKW. To realise the value of this funding, promising early-stage projects need to move along the research pipeline to produce robust evidence of their efficacy and effectiveness.

## **3. Work across the education ecosystem:**

England has a history of multiple reforms to national education policy, with successor governments greatly modifying, or reversing, the changes of the previous. This has led to past initiatives failing to create sustained change. To mitigate this, we suggest a multi-level approach to encouraging uptake by national government, subject or sector stakeholder organisations and in local teaching practice.

## **4. Influence national actors:**

Despite the increasing autonomy of state schools, as more convert to academies, there is still significant power held by national government. However, the factors influencing national policy are complex, embedded in power relations and rarely follow linearly from research evidence. For a relatively new initiative like HKW, there is value in partnering with an organisation that has an established voice to leverage existing relationships. It is also important to engage with school accountability measures and regulatory bodies like Ofsted, as these are powerful drivers of school practice.

## **5. Link with related initiatives and subject areas:**

There is a broader set of initiatives which seek to develop interdisciplinary education, explore how knowledge is created and empower students to develop critical abilities. By linking with these, HKW can form a coalition of likeminded initiatives, contribute to a wider complementary evidence base and leverage the energy already present across the system.

## **6. Seed practice in the classroom:**

With increasing devolution of curriculum, along with the changes brought in by the new Ofsted inspection framework, there is opportunity to encourage direct adoption of HKW in schools. Teachers are unlikely to directly access research outputs, and may face significant time constraints, so school leadership teams have an important role to play in facilitating research translation.



## Appendix: Key actors in England's education system

This mapping aims to be indicative rather than exhaustive, and by focusing on those most relevant to education in England, omits organisations primarily in others of the four nations. Stakeholders have been categorised into a loose typology of their role within the system, however organisations often act in multiple roles at once, for example the Nuffield Foundation funds education research and teaching resources. Where this is the case, stakeholders have been grouped by their primary focus.

Actor	Role
<b>Government</b>	
<b>Department for Education</b>	Responsible for children's services and education, including early years, schools, higher and further education policy
<b>Local Authorities</b>	Responsible for ensuring that there is good quality education in their area, including ensuring sufficient high-quality places locally. However, they may not have control over the schools in their area.
<b>Regulators</b>	
<b>Ofsted</b>	Ofsted is the Office for Standards in Education, Children's Services and Skills. It is a non-ministerial department responsible for inspecting maintained schools and academies, some independent schools, childcare, adoption and fostering agencies, initial teacher training and many other educational institutions and programmes outside of higher education. It also regulates a range of early years and children's social care services, and publishes reports of its findings to improve the overall quality of education and training and inform policymakers about the effectiveness of these services.
<b>Ofqual</b>	Regulates qualifications, exams and assessments in England.
<b>Independent Schools Inspectorate</b>	The <u>Independent Schools Inspectorate</u> inspects schools that are members of the associations that form the Independent Schools Council.
<b>School Inspection Service</b>	Other private schools are inspected by the <u>School Inspection Service</u> .
<b>Awarding Bodies and Publishers</b>	
<b>AQA</b>	Exam board providing GCSEs, A-levels and other qualifications.
<b>Edexcel (Pearson)</b>	Exam board providing GCSEs, A-levels, BTECs and other qualifications.
<b>OCR</b>	Exam board providing GCSEs, A-levels and other qualifications.
<b>EAL</b>	Specialist exam board for industry.
<b>City and Guilds</b>	Specialist exam board providing vocational and technical qualifications.
<b>International Baccalaureate (IB) Organisation</b>	The IB Organisation produces school curricula, assessments and teacher professional development. Its programmes are currently undertaken by more than a million students across 157 countries. <sup>lxiv</sup> It offers four programmes: Primary Years from 3-12, Middle Years from 11-16, Diploma Programme from 16-19 and the Career-related programme from 16-19. It also conducts research to support curriculum development and understand student outcomes. <sup>lxv</sup>

<b>Professional Bodies, Learned Societies, Think Tanks and Lobbyists</b>	
<b>British Educational Research Association (BERA)</b>	BERA is a membership association and learned society committed to advancing educational research quality, building research capacity and fostering research engagement. BERA also works to inform the development of policy and practice by promoting the best quality evidence produced by educational research.
<b>Royal Society</b>	The Royal Society's fundamental purpose, reflected in its founding Charters of the 1660s, is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity
<b>Royal Society of Chemistry</b>	The Royal Society of Chemistry's purpose is to advance chemistry. It is a professional body, a publisher of research, and a campaigner for the importance of chemistry.
<b>Royal Society of Biology</b>	The Royal Society of Biology advises government on policy, advances education and professional development. It encourages public interest in the life sciences.
<b>Institute of Physics</b>	The Institute of Physics supports teaching of physics in schools, encourages innovation in business, and provides advice and support to government.
<b>Science Council</b>	The Science Council sets the standards for professional registration for practising scientists and technicians.
<b>NASACRE and SACREs</b>	Every local authority is required by law to have a Standing Advisory Council for Religious Education (SACRE) which advises on RE provision and collective worship. NASACRE is the National Association of Standing Advisory Councils for Religious Education which advises and provides professional development to SACREs.
<b>Church of England</b>	The largest religion providing education in England. There are nearly 5,000 Church of England schools in England.
<b>Campaign for Science and Engineering (CaSE)</b>	The Campaign for Science and Engineering (CaSE) is the UK's leading independent advocate for science and engineering. It aims to ensure that the UK has the skills, funding and policies to enable science and engineering to thrive. It represents over 115 scientific organisations including businesses, universities, professional bodies, and research charities.
<b>British Science Association (BSA)</b>	The British Science Association aims to transform the diversity and inclusivity of science; to reach underserved audiences; and increase the number of people who are actively engaged and involved in science. It runs CREST, a nationally recognised scheme for student-led project work in the STEM subjects (science, technology, engineering and maths). <a href="http://crestawards.org">crestawards.org</a> .
<b>Teacher Member Groups</b>	
<b>National Association of Teachers of Religious Education (NATRE)</b>	NATRE is the subject association for Religious Education. It maintains and raises the profile of RE and tackles issues and concerns around the subject. It undertakes lobbying and advocacy work. provides teacher CPD, facilitates local peer networks, publishes a peer reviewed journal and produces teaching guidance including development of the 'non-statutory' National Curriculum Framework for RE.
<b>ASE</b>	The Association for Science Education supports all those involved in science education.
<b>Chartered College of Teaching</b>	The Chartered College of Teaching is the professional body for the teaching profession. Provides professional development including a Chartered Teacher Programme, publishes a peer reviewed journal and runs events and teacher networks.

<b>Trade Unions</b>	Trade Unions such as the National Education Union, the National Association of Head Teachers and NASUWT represent the interest of their members.
<b>Research Funders and Education Researchers</b>	
<b>Nuffield Foundation</b>	The Nuffield Foundation aims to improve evidence, policy and practice in education and skills. It funds educational research and development and student placement programmes as well as providing a large number of free teaching resources. Its focus area on science education funds curriculum development—including co-funding the development and evaluation of the Twenty First Century Science GCSE with the Salter's Institute—and is currently funding the development of practical guidance for the teaching of evolution.
<b>Salters' Institute</b>	The Salters' Institute is the flagship charity of the Salters' Company. It funds the development of secondary science curriculum and teaching materials by the University of York Science Education Group, practical chemistry activities in schools and the Salters' National Awards for Science Technicians.
<b>Comino Foundation</b>	
<b>Education Endowment Foundation (EEF)</b>	EEF is a charity focused on breaking the link between family income and educational achievement. It generates new evidence of what works to improve teaching and learning, funding independent evaluations of high-potential projects. It also works to promote uptake of research by communicating existing evidence and scaling the application of research findings, in partnership with a network of 39 Research Schools. It is currently funding an effectiveness trial of Philosophy for Children, an initiative with similarity to HKW approaches.
<b>Wellcome Trust</b>	Wellcome Trust is a charitable foundation, and the UK's largest funder of health research.
<b>NFER</b>	National Foundation for Educational Research provides education research for schools and policy.
<b>EPI</b>	The Education Policy Institute is a think-tank aiming to raise standards in education.
<b>Institute of Education</b>	The Institute of Education is a department within UCL, and a leading research institute and provider of teacher training.
<b>Higher Education Institutes (HEIs)</b>	UK HEIs with research centres related to HKW include the Philosophy, Religion and Education Research Forum at the University of Oxford, The Jubilee Centre for Character and Virtues at University of Birmingham; the Centre for Research in STEM Education at the University of Exeter, the Department of Education at York University. TWCF is already connected with many of these.
<b>Initial Teacher Training (ITT) and Continuing Professional Development (CPD) Providers</b>	
<b>Primary Science Teaching Trust (PSTT)</b>	The PSTT supports teachers of primary science with free professional development, a peer support network and teaching resources. It also accredits teachers through the Primary Science Quality Mark and runs primary science teaching awards to recognise teacher achievement. It supports academic research in connection with primary science and has run international conferences.
<b>Teach First</b>	Teach First coordinates an employment-based teacher training programme, placing graduates with a minimum 2.1 degree in schools where more than half the pupils come from the poorest 30% of families. As the UK's largest single graduate recruiter, <sup>lxvi</sup> it is a significant provider of initial teacher training.

<b>Ogden Trust</b>	The Ogden Trust is a charitable trust that promotes the teaching and learning of physics. It supports teaching and extra-curricular activities at schools, funds teacher CPD and provides teaching resources.
<b>Higher Education Institutes (HEIs)</b>	Higher Education Institutes includes universities and colleges as well as various profession schools in fields such as law, theology, teaching etc.
<b>STEM Learning</b>	STEM Learning is the UK's largest provider of education and careers support in science, technology, engineering and mathematics. They provide CPD for teachers, support staff and technicians, provide free teaching resources, train and support volunteer STEM ambassadors, and link STEM employers with schools and colleges.

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