

Epistemic Insight

THE FUTURE OF KNOWLEDGE



**THE ROLE OF EPISTEMIC
INSIGHT FOR HUMAN
FLOURISHING IN SCHOOLS**



Canterbury
Christ Church
University

About this proposal

This document presents two projects which are designed to work together with the overall heading of 'The Role of Epistemic Insight for Human Flourishing in Schools'. The projects are:

- Discovery Bags and Investigating Big Questions (for students aged 7-12)
- Reimagining Classrooms with Permeable Walls (for students aged 11-16)

The research is motivated by the aims of UNESCO's Futures of Education Initiative, the OECD Future of Education and Skills 2030 project and the Templeton World Charity Foundation's Innovations for Human Flourishing strategy.

Contents

About this proposal	2
The opportunity	3
How would the projects be funded and supported?	4
Themes and Research Questions	5
What's next	5
Discovery Bags and Investigating Big Questions	6
Vision and Rationale for this Project	6
How Will it Work?	7
Reimagining Classrooms with Permeable Walls	9
Vision and Rationale for this project	9
How Will it Work?	10
Impacts on students' attainment and aspirations	10
Teachers and students as epistemic agents	11
Agency	11
Co-created research	11
Assessment	11
Evaluation	12
References	13

The opportunity

Epistemic insight is defined as 'knowledge about knowledge especially knowledge about disciplines and how they interact'. Epistemic insight is essential for human flourishing and these interconnected projects are designed to engage teachers and learners with ways of creating and working with knowledge to address complex opportunities and problems in a rapidly changing world. Participating teachers and researchers collaborate and share expertise in curriculum innovation and pedagogy to strengthen students' pathways to becoming wise and compassionate epistemic agents. Teachers in turn are supported in becoming 'research engaged epistemic agents' with the support they need to work independently and collaboratively in their own schools and with other schools at a global level.

The projects are linked by a recognition of the value of the OECD Teaching Compass and Learning Compass. The Learning Compass 2030 defines "the knowledge, skills, attitudes and values that learners need to fulfil their potential and contribute to the well-being of their communities and the planet". One of the key categories of knowledge, 'epistemic knowledge' involves, "knowing how to think and act like a practitioner. It shows the relevance and purpose in students' learning and helps deepen their understanding" (OECD, 2019, p. 2). Currently there is not an outline for how students' epistemic knowledge might progress as they build their expertise, which is important if nations and jurisdictions are to agree how students' progress should be assessed. It is also not yet clear as to the extent to which 'real-world' projects can and should be distinctive or shared locally, regionally and globally. These are questions that our research can address.

We're very pleased that Professor Alona Forkosh Baruch of the Levinsky-Wingate Academic Center and Suzanne Dillon, Chair of OECD Future of Education and Skills 2030 project are also Advisors to the proposed project. In a statement of support, Professor Forkosh Baruch explains that:

Epistemic knowledge is rarely incorporated in education, even in cutting-edge programs, while in this initiative, it is the pillar. It addresses the need to rethink about the nature of knowledge, rearrange bodies of knowledge accordingly, and by this – to reinvent education in a way that makes it a powerful means to improve society at large in a digitally-saturated era.

We are also delighted to have the support and interest of Renato Opertti, Senior Expert at the International Bureau of Education, IBE-UNESCO who states that, "The Epistemic Insight Initiative on the Future of Knowledge offers a superlative reworking of the nature, purpose, contents and strategies of education."

Our proposed research is timely because it coincides with UNESCO's Futures of Education initiative which aims to rethink education and help shape the future. Key questions include, 'How can education promote sustainable development and global

citizenship, not only today but also tomorrow?' 'How should what, how and where we learn evolve in the future?' (UNESCO, 2022).

In seeking solutions we are grateful for Renato's words of support, that:

The 'EI' strategy for transforming the curriculum, pedagogy, teaching and learning helps us to see what is needed to achieve the UNESCO vision of educating new generations for sustainable, fair, inclusive and peaceful futures. We need to explore, test, expand and share renewed ways of collaboration and integration among knowledge areas and disciplines ... to realise the aspiration of better futures for our own and future generations.

How would the projects be funded and supported?

We propose to draw on the support of UNESCO's school network ASPNET and the ASPNet leaders. The UNESCO Associated Schools Network (ASPnet) connects more than 12,000 schools in 182 countries. We propose to work with teachers in up to 25 schools in each of 20 countries. This would mean an EI community of up to 500 schools, focusing on those that can most benefit from support.

We plan to group schools into clusters of four and where practical, to link groups of schools with tutors in a teacher education institution. Tutors could be recruited with help from the OECD Future of Education and Skills 2030 community. We are using this model currently and it is a wonderful way to encourage exchanges between schools and link teachers with tutors who specialise in science and other disciplines.

We hope to work with the OECD chair of The Global Forum on the Future of Education and Skills and other OECD leaders to develop, review and disseminate findings and recommendations via the forums they provide. We also hope that our work can inform the design of future assessments of students' epistemic knowledge and their capacities to apply epistemic knowledge in context (i.e. epistemic insight). PISA is the OECD's Programme for International Student Assessment. The assessments measure 15-year-olds' abilities "to use their reading, mathematics and science knowledge and skills to meet real-life challenges" (OECD 2021)

The Templeton World Charity Foundation currently support the research and equipment for the two projects - 'Discovery Bags' and 'Permeable Walls' - in more than 30 schools in England. We will approach TWCF to request 50% follow up funding to extend these two amazing and much loved projects – to serve a wider network of schools – and facilitate human flourishing in school education globally.

Schools that join the EI Community to take part in Permeable Walls and/or Discovery Bags will be able to apply for a bursary to help with printing resources, bringing students to workshops and facilitating teacher and student exchanges. Three years enables schools to establish new ways of working ensuring a sustainable change that continues beyond the project life.

Themes and Research Questions

These projects connect in turn to a wider strategy we have called, the Future of Knowledge. Across the proposed projects, there are some common themes and research questions. They are:

- What does it mean to be a wise and compassionate epistemic agent in an increasingly digital age?
- How can schools and academic institutions cultivate and teach epistemic curiosity, creativity and criticality – in other words – epistemic insight.
- To what extent can strategies and tools like the 'Discipline Wheel', 'bridging questions', 'research co-creation' and the 'bubble tool' motivate changes to practices in systems where barriers to flourishing are deeply entrenched.

In later sections of this document we illustrate where these themes are addressed by each of the projects.

What's next

To build an EI network of international schools and build teacher agency and professional relationships across nations, we propose to

- Collaborate with OECD Chairpersons and ASPNet leaders to assess what changes to make to the cards and investigations to tailor to their contexts.
- Set up systems of support by 'training the trainer' and by creating a communication network of more experienced and newer schools in the EI community.
- Develop a robust website with tailored and bespoke CPD sessions and support EI schools with evidencing various ways to embed EI pedagogy into the classroom experience – i.e. through a video recording, poster, blog, podcast to encourage international response.
- Use mixed methods to gather evidence of EI development. This will include surveys of teachers and students together with other forms of evidence (such as a filmed diary, a report/paper). These materials will help us to discover how teachers adapt and work with the resources to fit their curriculum constraints
- Scale up when and if there is evidence that the project is having the impact it is designed to have from a pilot study to 500 schools and potentially, 12000.



DISCOVERY BAGS AND INVESTIGATING BIG QUESTIONS



Participating students each have their own bag of equipment so that they can investigate for themselves some universal properties of water, air, light and sound.

By exploring Big Questions, students gain insight into ways that science interplays with the wider world of knowledge.

Vision and Rationale for this Project

This project expands the reach of our previous work on 'The Discovery Bags and Big Questions' strategy to allow greater numbers of children, including those of disadvantage, to benefit from and experience practical 'hands on' science enquiry.

Giving each student their own set of materials and scientific tools gives a significant boost to their individual agency, especially for those students who would usually leave it to others to lead in science. Group-work also has benefits and some of the suggested investigations are designed for students in a group.

Epistemic Insight

How Will it Work?

Each bag contains a selection of:

- Investigation cards
- Science materials
- Student resources

"Thinking like a scientist"



There is something wonderful about the idea that students in any country, school and setting can marvel at the way that water forms into droplets after falling from a straw or pipette.

When students share their scientific discoveries about the properties of water, they discover – as scientists have – that lots of things about water are the same wherever you are in the world.

The next objective in the learning journey is for students to appreciate how science relates to the wider world of knowledge. As they discuss their findings, students are encouraged to talk about 'what makes a question a good one for science'.

Epistemic Insight Essential Experiences in Science

How do clouds stay up?

Or a droplet of water caught in a leaf?

Have you seen a spider's web looking like this one?

What happens if two droplets run into each other?

Explore, Observe, Record

Dip a straw into a beaker of water and trap some water inside by putting a finger over the end. Drop water droplets onto a penny. Draw or record your observations.

Epistemic Insight Essential Experiences in Science

Why don't clouds fall out of the sky?

A cloud is made of tiny water droplets.

The droplets of water join up – just as they did on the penny.

As it rains, the cloud shrinks.

Once the water is gone, there is no more cloud!

What happens to the cloud after it rains?

You may not see it shrinking because clouds are moving, blown along by the wind.

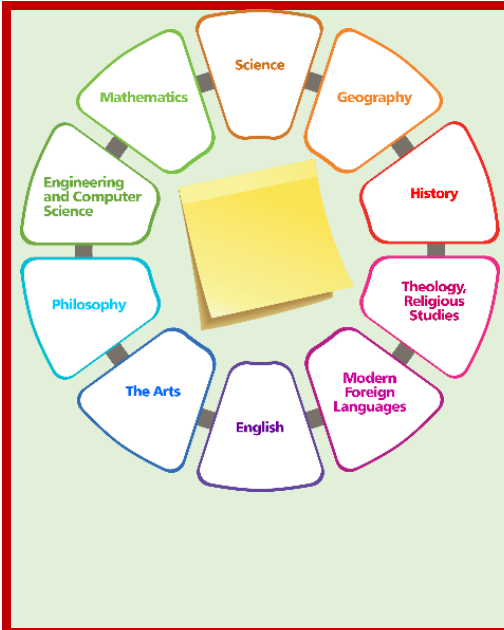
But you might see a rainbow!

The sky darkens...

Big droplets are pulled to the ground by gravity.

They are too light to be pulled to the ground.

Epistemic Insight

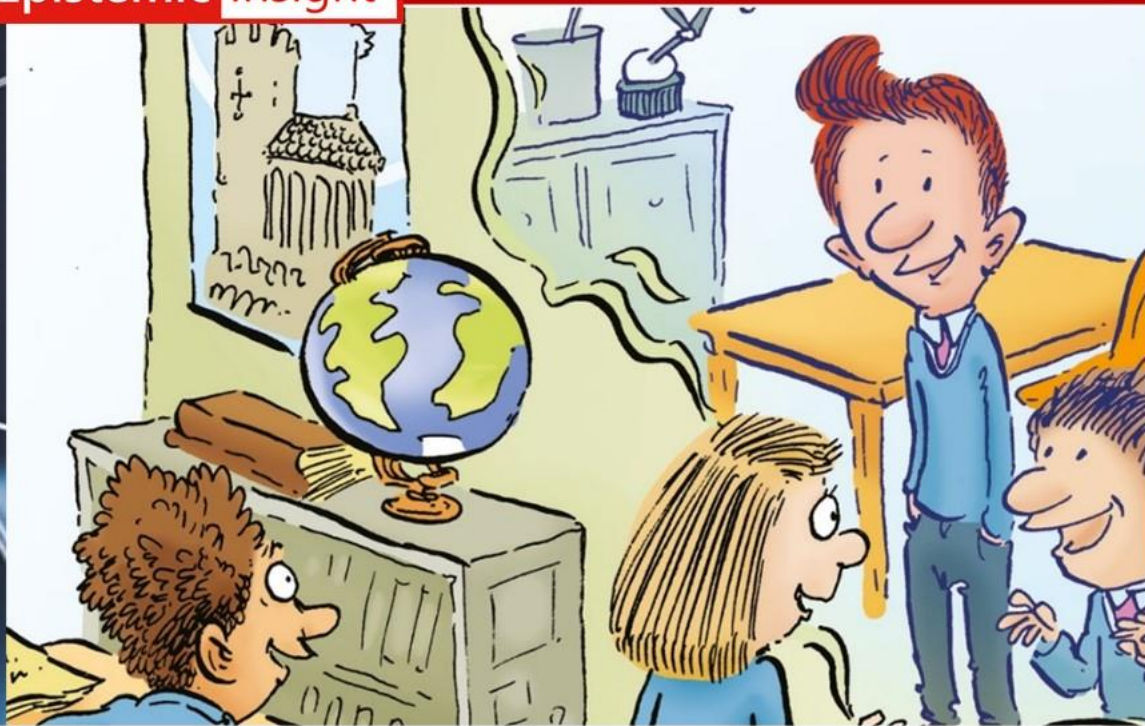


The third step can be to compare science with other discipline, such as history to develop students' appreciation of how different disciplines help us to understand the world around us.

Or the teacher could invite students to choose a Big Questions to explore. Big Questions include, 'Is it true that 'you are what you eat?' 'What does it mean to be me?'

Big Questions are an opportunity to appreciate why and how science can work other disciplines like history, geography, theology and the arts.





REIMAGINING CLASSROOMS WITH PERMEABLE WALLS



By understanding the distinctive contributions of different disciplines and how disciplines work together, students become better equipped to address global opportunities and problems like diversity and sustainability.

Vision and Rationale for this project

This project aims to support secondary schools and colleges in developing more 'epistemically insightful' approaches to delivering their curriculum.

Schools are increasingly engaging with new and urgent initiatives that are designed to address community inequalities like health and citizenship education, or contemporary social issues such as sustainability, and digital misinformation. In practice this means giving students opportunities to ask and explore Big Questions such as 'How if at all can new technologies improve lives for people who are lonely?'

Epistemic Insight

'What are the most appropriate solutions to natural resource inequalities?', and 'How can we live sustainably?' Big Questions bridge subject boundaries and draw together many aspects of being human in complex ways that rarely have simple agreed-upon solutions. It is equipping students with the ability to navigate these complexities that lies at the heart of this project.

How Will it Work?

Reimagining schools with Permeable Walls works with the epistemic insight 'knowledge about knowledge' curriculum framework to provide the starting point for a whole-school approach to helping students to become epistemic agents.

Participating students are supported in undertaking their own research to address their choice of a Bridging Question, choosing the one that best fits their interests from an extensive list. Bridging questions are pedagogically designed by teachers to be opportunities to see two contrasting disciplines working together.

Once students become more confident and expert in working with disciplines they propose a Big Question that they would like to investigate. Big Questions are opportunities to see many disciplines working together. Students create academic posters which they present at a 'Big Questions' event to an audience of teachers, parents and other invited guests.

Impacts on students' attainment and aspirations

This section explains that research has shown that developing students' epistemic insight boosts the attainment and aspirations of students who are currently underrepresented in universities, particularly in the sciences.

There is global recognition that students are unlikely to stay engaged when the disciplines they are meeting in school seem to have nothing to say about the questions and issues they see as important. Compared with their peers, this most affects students who do not have someone at home to boost their understanding of the curriculum.

Recent examination data from the first cohort of students on the Epistemic Insight (EI) Informal Science Learning programme has shown "sustained" EI engagement for students, has positively impacted academic attainment. It is called 'Inspiring Minds' (see www.canterbury.ac.uk/inspiring-minds), The independent evaluation used a comparator group selected for prior attainment, ethnicity and socio-economic status and showed the participating students achieved an average of 6 grades higher across their core eight exam subjects than the comparator group, and 13 percentage points more likely to achieve a good pass in English and maths.

Teachers and students as epistemic agents

Agency

Both projects students are designed to develop students' epistemic insight through activities that use real-world contexts to build their epistemic agency. Agency is perceived and interpreted differently around the world and there is not one definition that is applicable across the world's different cultures. In some cultures self-regulation is important in maintaining harmony in society, whereas in some others, self-regulation and resilience are encouraged to help students to achieve personal goals. Even withstanding these variations agency as a concept "has relevance in every context" and "Student agency – students' ability to play an active role in their education – is thus central to the OECD Learning Compass 2030" (OECD, 2019, p. 7)

Co-created research

Just as importantly their teachers become epistemic agents through shared training, knowledge and exchanges with researchers. By understanding how knowledge works across disciplines teachers become better equipped to co-research and co-lead the learning ethos within their school.

The UNESCO report on 'Reimagining our futures together' advocates the "tremendous potential" of "research partnerships that are interdisciplinary, inter-sectoral and cross-cultural, that span academic, civil society and educational milieus, and that foster shared communication and mutual learning" (UNESCO, 2021 p.25). The value of teacher agency and of being valued as a professional are also emphasised in the OECD Learning Compass (2019 Future of Education and Skills 2030).

Assessment

EI is teachable, assessable and transferable across the school curriculum - making it attractive to schools wanting to track students' progress and show impact.

For students in upper primary school, the objectives are for students to appreciate that

- Science begins with observations of the natural world and constructing ways to explain our observations.
- Science has some similarities and some difference with other ways of knowing that we learn about in school.
- Investigating Big Questions can help us to see science and other disciplines working together.

Epistemic Insight

In lower secondary school, students build on these foundations to advance their understanding of science as a discipline, compared with other disciplines they study. They explore ways to apply their epistemic knowledge in different contexts. Students appreciate and understand that

- Different disciplines have different preferred questions, methods and norms of thought
- Some questions are more amenable to science than others
- Science informs our thinking about Big Questions; Big Questions seldom have simple agreed-upon answers

Activities to track teachers' professional development are likely to include:

Recording and describing occasions where schools host 'Big Questions days' and where they come together to share practice, and create and swap EI puzzles

In addition, teachers to be encouraged to produce new resources/publish experience in review. This will enable sharing of good practice/ideas and enable outputs to be evaluated.

Evaluation

The efficacy and impact of the interventions are assessed in relation to the three research themes.

After a period of knowledge exchange, each participating school will be asked to provide a structured case study relating to their experiences. The structure guiding this will relate to the evaluation outputs outline below. This could be provided in a range of ways depending upon the facilities and resources available to the school. As a base line, each school can be asked to provide a similar output prior to participating in the strategy to outline their teaching of science, challenges they face and how they believe it fits with other disciplines.

The case study will then be qualitatively assessed to determine the following:

- Language used and stories told – this will look at whether language used in the case study directly reflect EI language, or is it analogous to the terms and concepts. This can be compared to the base line audit to determine increase in EI.
- Actions – we will examine how schools are using the insights from the DB and is this enabling them to develop novel ways of teaching science and interacting with other disciplines.
- Framing – by exploring changes in how concepts and language are framed we can look for impact on wisdom and compassion. For example, we will explore

Epistemic Insight

whether teachers' and students' perspectives relating to insights provided by different disciplines have grown.

- Tools- we will investigate the extent to which EI tools like the Discipline Wheel and resources and equipment provided to schools have been used for further activities.
- Cascading – we will seek to find out to what extent teachers they developed links with colleagues or other schools to cascade ideas.

The scale of the project will provide a huge data set that could be very valuable in publishing outputs.

The evaluation studies will also look at the impact of co-creating research on teachers' concept of self-efficacy, career aspiration, and impact of active agency on their wellbeing.

References

OECD (2019) Future of Education and Skills 2030 Concept note for Knowledge, 2030, Available at: https://www.oecd.org/education/2030-project/teaching-and-learning/learning/knowledge/Knowledge_for_2030_concept_note.pdf accessed 30th August 22

OECD (2019) Student Agency for 2030, Future of Education and Skills 2030 Concept Note, Available at: https://www.oecd.org/education/2030-project/teaching-and-learning/learning/student-agency/Student_Agency_for_2030_concept_note.pdf accessed 29 August 2022

OECD (2021). What is PISA? Available at: <https://www.oecd.org/pisa/>, accessed 14 September 2022

UNESCO. (2021). Reimagining our futures together: a new social contract for education. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000379707.locale=en> UN. ISBN 978-92-3-100478-0 accessed 16 July 2022

UNESCO (2022) Transforming education: ASPnet key initiatives, Education for sustainable development, global citizenship education and inter-cultural and heritage learning, Available at: <https://www.unesco.org/en/education/aspnet/key-themes> accessed 4 September 2022