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Review article

Academia–industry partnerships in edtech: bridging the gaps in engaged research

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Abstract

Despite extensive adoption and substantial investment in educational technology (edtech) tools, their full potential to enhance learning remains largely untapped. Addressing this gap requires improving research infrastructure, fostering collaborative environments, and promoting domain-specific educational research through innovative methods. This article reflects on lessons learned from academia–industry partnerships in edtech, focusing on engagements aimed at driving impactful outcomes and strengthening evidential support for children's edtech. In the absence of government-funded infrastructure for sustaining these partnerships, we established an international, virtual Centre for edtech Impact to connect researchers, industry and practitioners. Drawing on examples from the Centre's work, I highlight the challenges and opportunities in edtech academia–industry collaborations and outline pathways for future partnerships to develop more effective technologies for children's learning.

Keywords edtech; education; technology; engaged research; learning engineering; learning sciences

Key messages

- Engaged research with the edtech industry needs a blueprint and commitment to ensure transparent, rigorous and non-biased evidence-based innovation.
- A systems-level perspective on edtech is needed to ensure an equitable approach to edtech evidence building in both the Global North and the Global South.
- International agreement on minimal quality standards for edtech can act as a catalyser for effective academia–industry partnerships, accelerating engagement of both small and large businesses with researchers.

Introduction

The rapid expansion of generative artificial intelligence (AI) applications in education has heightened concerns about systemic quality issues in children's educational technology (edtech). One key issue is the independent evaluation of the learning outcomes attributed to the use of specific edtech tools: despite the significant popularity of children's educational tools, and the substantial funding that the edtech industry attracts, little is known about how these tools actually contribute to learning (Hirsh-Pasek et al., 2015; Meyer et al., 2021; UNESCO, 2023). Qualitative and small-scale studies reveal various patterns of students' engagement with the tools; for example, Roskos et al. (2014) identified a set of descriptive patterns for analysing how US 4-year-olds engage with e-books with their teachers, and several studies show how positive attitudes and teachers' support enhance learning enriched with edtech – for example, Kong and Lin's (2022) study with primary school programming classes in Hong Kong. These studies are primarily of qualitative nature and conducted in countries with high economic development. With a few exceptions (for example, a randomised controlled study in Malawi by Pitchford et al., 2019), very few rigorously designed studies have investigated the added learning value of digital technologies for students living in low- and middle-income countries.

Improving the situation involves enhancing research and development infrastructure, fostering collaborative research environments and innovative research methods globally, and promoting domain-specific educational research through local collaborative networks (Baker et al., 2022). In this article, I reflect on the lessons learned from working in academia–industry partnerships with the edtech sector, with the goal to drive impactful outcomes and strengthen evidential support. In the absence of government-funded infrastructure for facilitating researched innovation for sustaining edtech industry–research partnerships, we built a mechanism for bringing researchers, industry and practitioners together in the form of an international, virtual centre, the International Centre for EdTech Impact; WiKIT.

In this context, *researchers* are defined as academic scholars specialising in education and learning sciences, *practitioners* are educational professionals such as teachers and educators, and *industry professionals* include developers, designers and professionals in the edtech sector. With *partnerships*, I am referring to the collaborations that these three groups of professionals engage in to jointly work towards a shared goal. In a partnership, the researchers work closely with industry professionals, providing technical assistance to embed learning science concepts into products, conceptualise studies, or conduct research using the tools. The industry representatives may provide access to the technology and data to the researchers and practitioners, and they develop their products based on the research findings and the practitioners' feedback. The practitioners provide pedagogical insights, feedback and access to their classrooms for testing the tools. In this way, the three-way academia–industry–practice partnerships lead to the development of innovative and often improved edtech solutions (Cukurova et al., 2019; Luckin and Cukurova, 2019).

Following a short literature review, I use examples from the Centre's work to illustrate the challenges and opportunities within edtech's academia–industry–practice partnerships, with a focus on

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the academia–industry dynamic. I also outline pathways for future collaborations that can foster more impactful technologies for children's learning.

I argue that three pathways (accountability, regulation and innovation) can be established through three key mechanisms that structure partnerships into engaged research, namely the mechanisms of: precise domain and mindset match; ecosystem-building initiatives; and purposefully cultivating the future of edtech research. These mechanisms then build the pathways for a thriving ecosystem of academia–industry collaboration.

Missing or low educational impact of children's edtech

Traditionally, the research conducted by the edtech industry (either as internal or as commissioned research) has placed significant emphasis on market research, aiming to understand educators' needs and market affordability, and assessing product acceptance among potential customers and users. Governments are typically more interested in research that evaluates products based on their cost-effectiveness and efficacy, as illustrated by the outputs of the US What Works Clearinghouse (IES, 2025), World Bank Smartbuys (World Bank Group, 2025) and the UK's Education Endowment Foundation (EEF, 2025).

Industry researchers investigate design enhancements, exploring possibilities for how products could function better and how the technology design could be refined. This differs from academic researchers, who typically focus on the wider context by comparing multiple tools or examining broader learning patterns enabled by these tools, and, crucially, the educational impact of the technologies, or the added value they bring to learning and teaching. The different research focuses in the edtech field reflect the naturally different priorities of the different stakeholders representing academia and industry, but they also highlight the significant disconnect between research happening in the edtech industry and that occurring in academic circles.

The disconnect is a key reason why few popular children's digital media that have been developed within the principles of the science of learning have been formally and independently researched by academic scholars (see Hirsh-Pasek et al., 2015). Several evaluations of the key design elements of commercial edtech for children show that these tools misalign with key learning principles, including the multimedia principles of learning (Meyer et al., 2021), such as the placing of images or texts in a multimedia task. This lack of incorporation of learning sciences into the edtech design is directly traceable to children's outcomes. In the literacy domain, for example, a meta-analysis by Egert et al. (2022) found that children's digital books can significantly enhance language and reading comprehension, but this positive impact was observed only with digital books developed by researchers in their labs. For commercially available tools, the impact was low or negative.

The research–industry disconnect in edtech exists for several reasons, including the lack of a legal or policy requirement for collaboration between academics and edtech providers, and the lack of a tradition of such collaborations. Developers argue that research-based prototypes rarely transition to real-world applications due to challenges in sustainability, long sales cycles and unclear market signals, while educational researchers often lack the time or motivation to engage in evaluations of specific tools, as they prioritise academic publications over reports commissioned by the industry (Dore et al., 2018). My experience of working at the intersection of academia and industry in children's edtech reflects these challenges. During my PhD, I co-developed an edtech tool based on sociocultural theories (The Our Story app, https://www5.open.ac.uk/apps/our-story-2), but despite proven impact (see, for example, Kucirkova and Cremin, 2024; Kucirkova et al., 2019), it was never commercialised. During my postdoctoral and later studies, I developed other prototypes and evaluated commercially available platforms through observational and experimental studies, as well as meta-analyses. I've seen great potential to improve commercial tools through science, but also persistent barriers to collaboration between researchers and edtech developers. Over the past fifteen years, I have found that my personal experience of the challenges in the academia–industry partnership space illustrates a systemic issue that calls for new methods of engaged research in edtech.

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Engaged research in children's edtech

Engaged research can be understood as a way of applying the philosophy of integrated research–practice–design (iRPD) partnerships (see Kucirkova, 2017), also known as the golden triangle (Cukurova et al., 2019), where researchers collaborate with developers and practitioners (teachers) to develop and design edtech products and test them in classrooms. The iRPD and golden triangle models emphasise the collaborative, mutually enriching roles of the three partners – teachers, researchers and developers – who all have an equal voice. Each partner negotiates meaning and perspectives to achieve the shared goal of ensuring that technology meets the needs of the users. In my case, the children are at the centre of this partnership triangle, benefiting from the combined expertise and collaboration of all parties involved. Moreover, the partnership approach ensures that the products are grounded in the learning sciences, follow latest technology innovation and have practical applicability in real-world educational settings.

Both the iRPD and golden triangle models are idealised frameworks for engaging the three key components of the edtech ecosystem. In practice, engaged research often sees one or two parts more involved than the others. For instance, in *testbeds*, teachers and developers tend to be more engaged than researchers. Testbeds are systems that actively incorporate teacher feedback into the edtech design cycle, fostering collaboration between teachers and designers, especially in the early stages of product development, such as with start-up companies. Testbeds enable iterative testing, generating real-time evidence that informs product design and implementation to better meet educational needs (Vanbecelaere et al., 2023). Testbeds often take the form of location-specific hubs where teachers and developers meet to discuss their needs, and local university researchers provide methodological support to guide the design-testing process in the schools. A common testbed methodology is a 'sandbox', which leverages methodologies such as lean impact and user-centred design to quickly generate learning and enhance the robustness of interventions (EdTech Hub, 2022).

Engaged research in testbeds differs from traditional efficacy research in edtech, with more involvement from researchers and developers, and less involvement of teachers. Edtech efficacy research has been popular in the USA since the introduction of the Every Student Succeeds Act (ESSA) standards in 2015. Given the ESSA standards' requirement for edtech companies to demonstrate that they have had their research verified by third-party researchers, there has been a surge of research carried out by various research firms and organisations (for example, LearnPlatform by Instructure, WestED) that review a company's internal evidence and carry out independent studies to align the company's evidence with one of the four tiers of the ESSA standards. These four tiers are: Tier IV, which represents conceptual evidence that checks the alignment between published research and the edtech tool; Tier III, which is concerned with non-experimental research such as observational studies; Tier II, which is about quasi-experimental research that provides evidence from studies without randomly allocated groups; and Tier I, which is the highest tier of evidence, focused on randomised controlled trials (US Department of Education, 2025).

A practical example that closely aligns with the ideal premise of engaged research – where research, industry and teachers are equally involved – is a research and development (R&D) approach to edtech. This has recently been framed as 'inclusive' or 'advanced' edtech R&D. An example here is the newly government-funded Advanced Education Research & Development Fund (AERDF) in the USA (https://aerdf.org/), which promotes R&D in pre-K–12 education, with an emphasis on an inclusive approach that involves developers, researchers and teachers (as well as users, including children) at all stages of the process.

R&D initiatives that take into account student variation, including those typically marginalised, and that ensure universal design that accommodates all learners from the start (Dolan, 2000), is a human rights issue. From this perspective, inclusive R&D means intentionally including children (not only teachers and other adults) in the entire design and research cycle.

Child-led co-design is a significant area of engaged research in human–computer interaction studies, pioneered by Professor Alison Druin in children's digital libraries (see Druin and Kolko, 2017). This

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approach has been continued by research groups worldwide, such as the Children's Research Centre at the Open University in the UK, where children act as co-researchers and co-designers of all educational resources, including edtech. At the University of Washington in the US, for example, the KidsTeam Lab is specifically dedicated to researching children's technologies by partnering children as co-designers with the university researchers and the technology providers.

These examples showcase the potential of engaged research, but they remain the exception – most commercial edtech products are developed without the three-way partnerships of academia, industry and practice. In the next section, I outline the key reasons for the lack of engaged research in edtech identified in the literature, and some suggested ways to address them.

Challenges in academia–industry partnerships

While the ideal scenario of engaged research is that all edtech organisations work in partnerships with researchers and educators, the reality is that such endeavours are typically only feasible for large edtech providers (companies that have moved beyond the start-up phase, demonstrating proven market traction and revenue), which have ample resources to deploy multiple teams, commission external research and spend time on knowledge-brokering activities. For example, the onebillion software was tested extensively through randomised controlled trials as well as teacher-centred implementation studies in Malawi thanks to generous support from various donors and philanthropies, including the XPrize, Cisco and Lego Foundations. These studies resulted in academic publications (for example, Pitchford et al., 2019), and their cumulative nature led to established trust among government officials who are, at the time of writing, scaling the software to all schools nationally. Yet, the edtech market is characterised by many edtech tools: there are over 500,000 educational apps available on the market, primarily managed by small businesses that do not have budgets for any kind of research, let alone engaged research.

Addressing this challenge requires concerted efforts from stakeholders across the edtech ecosystem to incentivise and fund research that improves and validates the educational value of *all* technologies (Rajasekaran et al., 2024), both those produced by large publishing houses such as Pearson and those produced by big technology companies such as Google or Microsoft, as well as small local start-ups. Despite the moral attractiveness of inclusive research and development, without dedicated funding streams, edtech developers prioritise revenue generation and performance metrics such as reach over the actual impact on student learning (Rajasekaran et al., 2024). The demand from the market, whether from schools directly or through district-level procurement teams, and the demand from investors, has traditionally been based on scalability and efficiency rather than on the technology's impact on learning. This interest is typically centred on metrics such as user numbers, cost savings and teacher efficiency, rather than on prioritising educational outcomes (Kucirkova, 2024). The misalignment between edtech's drive for scalable innovation and its educational benefits has been recognised as harmful to children's learning by researchers, industry leaders and policymakers, yet no one seems to take responsibility for addressing it, as highlighted in a fittingly titled report, 'Limited evidence in edtech: Everyone agrees – it isn't their fault' (Francisco and Epstein, 2017).

Misaligned incentives

Each stakeholder is motivated by different incentive mechanisms and understands evidence in a different way; indeed, even major clearinghouses operationalise evidence of impact in different ways, leading to different recommendations for effective solutions (Wadhwa et al., 2024). The ambition to align a major ecosystem such as edtech with the different stakeholders under one single definition of evidence and set of incentives is thus unrealistic. What is needed instead, as Kucirkova and Dockterman (2024) argue, is a paradigm shift around how evidence is produced, communicated and used. Against this backdrop – and recognising that the edtech field is moving through an evidence paradigm shift in the 2020s

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(Kucirkova and Dockterman, 2024) – our Centre's work has focused on mechanisms to advance evidence-based edtech through an approach that strives for engaged research, even if it does not fully achieve it. One of these mechanisms has been to foster long-term collaboration between researchers and industry partners through various matchmaking initiatives.

Mechanism 1: Precise domain and mindset match for sustained collaborations

In edtech, industry and researchers have different incentives – researchers aim for academic publications and career advancement, while industry seeks higher product value. There is thus a critical need to establish a shared motivation for collaboration. While both stakeholders recognise the moral imperative to bridge gaps for children's benefit, this alone is not enough to drive ongoing collaborations (Dore et al., 2018). Some attribute the lack of collaboration to insufficient public funding for innovation (which is problematic in all aspects of research, not only edtech – see, for example, Edwards and Roy (2017)), but a stronger motivator for collaboration might be a precise alignment between developers' and researchers' needs for impact in the products they co-create.

At the Centre, we recognised the need for better alignment after several short-term, and ultimately unproductive, collaborations where researchers and industry representatives met once or twice but failed to sustain a long-term partnership leading to a joint product or project. Through feedback from both sides, it became clear that a strong match between their needs and goals was crucial for lasting collaborations. In response, we developed an infrastructure to facilitate precise matches, prioritising domain focus and expertise as a key motivation factor.

In practice, this means maintaining a detailed database of learning scientists, cataloguing their expertise and research focus, and strategically matching them with edtech organisations based on precise alignment with the organisations' focus. The goal is not just to connect any researcher with any edtech company, but to ensure an exact match between the company's identified market gap (following a thorough competitor analysis) and the researcher's specific area of study. For instance, if a product aims to enhance phonological awareness in 4-year-olds, we would seek a professor specialising in early reading skills with at least two published studies on phonological awareness.

In addition to precise domain match, we strive for a match in 'mindsets'. When new learning scientists join the network, they undergo a two-stage process. First, they self-identify their expertise and potential contributions to an edtech tool's impact journey through a standardised questionnaire. This is followed by an interview that further explores their capabilities and assesses their 'evidence mindset', that is, their attitude towards what is possible in building evidence.

In addition to domain expertise and mindset alignment, we also consider the researcher's geographical expertise (for example, for an app evaluation in Kenya, ideally, a researcher with local expertise is part of the team), as well as the required methodology and specific research stages for the project. This is why the matchmaking process often leads to a team of two or three researchers supporting an edtech company, rather than a single researcher.

Establishing a strong match between industry needs and the combination of researchers' qualifications and perspectives on evidence has driven the Centre's growth through a snowball effect. Researchers recommend the network to colleagues, while industry partners share positive experiences on social media or in published research, attracting more companies and participants to join. Some of the scientists in our database openly share their profiles at https://www.foreduimpact.org/edtechmentors.

Adopting this network approach to academia–industry partnerships is not only about meeting large demand. It is also about leveraging the collective expertise of multiple experts and the multiple disciplines they represent. Current matchmaking efforts in the edtech field (for example, those facilitated by The Learning Agency, USA) focus on the emerging field of *learning engineering*, which integrates insights from learning sciences, computer science and data science within a framework of human-centred design (see https://the-learning-agency.com/). The learning engineering approach draws on collaborative partnerships that bridge research and practice through continuous feedback loops to enhance how

technology supports learning across online, blended and face-to-face environments (Kolodner, 2023). Traditional learning engineering focuses on cognitive and learning sciences (comprehension, learning analytics, natural language processing, computational linguistics) and on systematically collecting large-scale learning data to enhance educational outcomes. As such, the learning engineering approach to matchmaking could be enriched by a multidisciplinary perspective on learning. Multidisciplinarity is an important factor in advancing research and elevating the quality of edtech: the current scientific base is dominated by cognitive research from scientists based in the Global North (Cukurova et al., 2019), which limits the application of the research to local contexts and reduces the impact that interdisciplinary research could have on the quality of edtech products.

Mechanism 2: Ecosystem-building initiatives

When establishing the Centre, we leveraged ecosystem-building initiatives as a foundational framework to mobilise collective expertise. In innovation ecosystems, partnerships have long been recognised as a key strategy (Schiuma and Carlucci, 2018), particularly in alignment with United Nations Sustainable Development Goal 17: 'Partnership for the goals' (see Oliveira-Duarte et al., 2021). Partnerships are crucial not only among researchers, practitioners and developers, but also within these groups. For instance, we established partnerships with renowned networks such as the GSoLEN, comprising 860 learning scientists, and the think tank International Collective of Children's Digital Books, a network of researchers specialising in children's literacy edtech. These collaborations formed the basis of a comprehensive database of approximately 1,200 scientists spanning diverse disciplines, research stages, edtech experience, global regions and methodological approaches. From there, the database has been growing organically through researchers self-registering their interest. We also established partnerships with key players in the edtech research and evaluation space, including large international entities such as Digital Promise or ISTE, as well as key teacher networks, such as the Global Schools Forum, which further sparked interest in collaboration from learning scientists. We also partnered with other universities interested in edtech collaborations; for example, the University of Helsinki, which has recently launched a collaboration with educational researchers and the Finnish edtech industry, and the Oulu University, Finland, for facilitating internships with graduate students at the Centre. Membership of international agencies, such as the Centre's membership of the UNESCO Global Education Coalition, have further strengthened the Centre's position.

Partnerships and academia–industry collaborations at the Centre are further supported through webinars and joint publications. The Centre organises monthly webinars in which researchers from various institutions discuss latest edtech-related studies, alongside industry representatives and their innovation perspectives. These sessions are recorded and made available as part of our resources. Additionally, we produce reports, several of which have been co-published with the University of Stavanger. Further community-building initiatives include physical gatherings, such as breakfast meetings or happy hours held during annual technology and education conferences, which provide informal networking opportunities for the community. Also, blogs by various researchers who voluntarily share their insights, Substack articles and interviews with edtech founders (written as short articles) contribute to a dynamic online repository of free multimedia materials, which is curated and contributed to by the community.

Mechanism 3: Cultivating the future of edtech research

It is important that academia–industry partnerships happen not only between established professionals, but also between emerging researchers, including graduate students. The European Union project EdTech Talents in Estonia, Hungary and Serbia (https://edtechtalents.eu/about/) is dedicated to matching researchers in these countries with local edtech companies, and to bringing in both senior and junior researchers for each project. At the Centre, we facilitate internships for master's students on a regular basis. For instance, through our agreement with the University of Oulu, three master's students worked on projects with us throughout summer 2024 and joined again in 2025. They participated in initiatives where

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they shadowed senior colleagues or worked directly on projects commissioned by edtech companies, gaining invaluable hybrid experience in research and practice.

Our aim is to nurture the next generation of engaged researchers (Holliman and Warren, 2017), the future generation of edtech scholars, who can address the evolving needs of the industry through global internships with companies. For instance, interns from Finland and Sweden have collaborated with companies in the USA, while counterparts from Colombia and Vietnam have engaged with edtech firms in sub-Saharan Africa. Models for such international cross-disciplinary engagement are also emerging in AI-related applications of scholarly knowledge (for example, Bond et al., 2024) and could further inform the K–12 edtech partnerships.

Support for partnerships in the edtech field must extend beyond current stakeholders to include the training of future generations of researchers who are specifically skilled in edtech. Therefore, in addition to coaching and mentoring the next generation of edtech scholars, it is important to directly train researchers and develop courses (for example, master's courses such as those at McGill University, the University of Vancouver and the University of Pennsylvania's Graduate School of Education, which focus on edtech training) specifically dedicated to the research and development of edtech in various areas (K–12, higher education, workforce development and so on). Currently, many initiatives depend on researchers who have transitioned out of academia or are balancing academic roles with industry work. This is not a sustainable model, and it could be addressed through professional research training programmes that target research advancement in the edtech space. To meet the growing demand globally, and the importance of incorporating local expertise in educational systems and curricula, securing funding for local research training programmes through government initiatives or scholarships would ensure that they are offered more equitably to all interested students.

Current challenges and future opportunities

There are two challenges that hinder the growth of the edtech-engaged research ecosystem: one relates to infrastructure for data sharing, and the other to diverse and sustainable funding streams.

Our Centre has developed a series of research protocols and reports on effective research engagements in individual learning domains and stages of edtech product maturity. A key obstacle we face in implementing these protocols is the fragmented and inconsistent access to data owned by the edtech industry. When students' data are not being analysed by researchers but by the industry teams, it presents significant obstacles to both educational advancement and the enhancement of product design. It also raises a moral question when data collected by providers for commercial purposes – used to improve products and align with user engagement – is easily accessed through their devices, while researchers face significant obstacles in accessing student data due to elaborate ethical board reviews and complex open data agreements (see Livingstone et al., 2023).

To enhance the quality of research and its impacts on both producers and stakeholders, the Centre researchers have spearheaded the advocacy for an open edtech data repository (Kucirkova, 2023). While some edtech companies utilise data for rapid evaluations and product refinements based on teacher feedback or efficacy studies, the transparency of these evaluation processes remains limited. Globally, there is a need for edtech companies to share their data openly for broader research purposes, rather than solely for proprietary business interests. The vision of the open data repository is that the collaborations between industry and academia would be more cohesive and pluralistic in that the open data repository would leverage the collective expertise of diverse research networks, local contexts and sets of data. Furthermore, fostering greater integration and openness in data sharing and research collaborations will be essential to advancing the field of educational technology and achieving more impactful outcomes for learners through high-calibre interdisciplinary research.

In terms of funding, we explored three funding streams for our Centre. First, direct connections with the industry enable scholars to test ideas and access substantial datasets, enhancing their research

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impact. Many academic experts are therefore willing to contribute pro bono time, collaborating with developers on grant applications and research bids, often listed as principal investigators alongside industry partners, and thus receiving direct return on their time investment when a project gets funded through public research council grants.

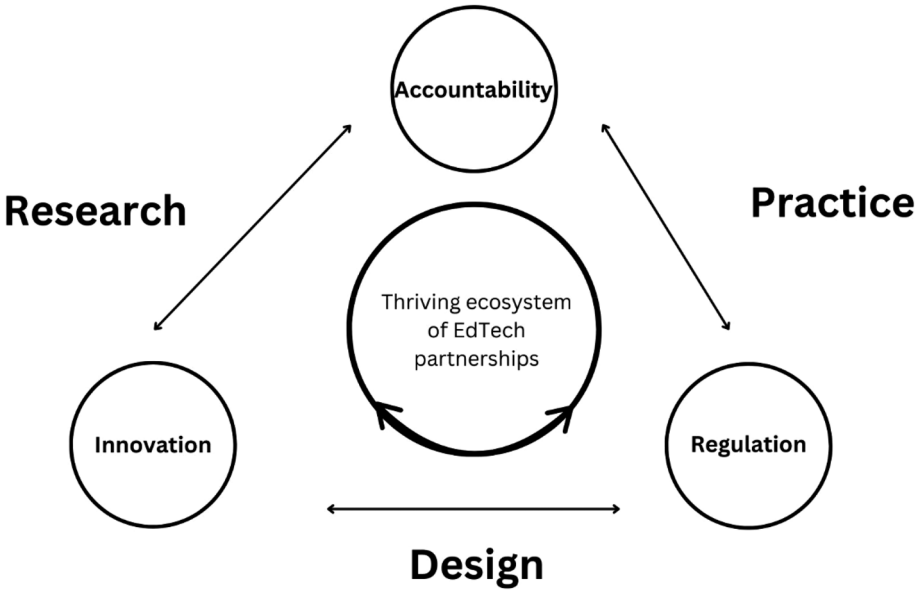
Second, philanthropic organisations such as family offices and foundations play a pivotal role in sustaining the work and supplementing government funding. For most philanthropies, the focus of the Centre's network on domain expertise and specific geographic areas facilitates funding: large foundations typically invest in selected geographical areas and in evidence-based solutions within specific domains, for example early mathematics, AI (supported by the Gates Foundation), learner variability (endorsed by the Jacobs Foundation) or playful learning (championed by the Lego Foundation).

Third, private sector funding is also important, with edtech companies commissioning usability and feasibility studies or evaluation research directly from the researchers. Furthermore, venture capitalists and other investors fund research to monitor performance or manage the impact of their portfolio companies and have funded researcher workshops, mentorship or masterclasses delivered by the Centre's researchers. Establishing clear guidelines, such as pre-registration of empirical studies, ensures independence and commitment to openly publishing all findings (positive, negative or neutral), and this is an essential condition for privately funded research projects. The commitment to open-access publishing of the findings as public goods is another key condition for such funded work.

Pathways for future partnerships

There are three ecosystem pathways that are essential to build, enhance and maintain engaged research in edtech partnerships. Some of these pathways exist already, but they are not connected as a system. One pathway is outcomes-based contracting: to motivate the edtech industry to partner up with academic researchers, investors must fund solutions that have demonstrated their efficacy and effectiveness in improving learning outcomes. Investors (and, by default, the edtech companies they invest in), follow the market interest, so the interest in learning outcomes needs to come from the schools. This can be facilitated through new investment mechanisms, such as outcomes-based contracting, which ensure that funding is tied to measurable learning results. In outcomes-based contracts with edtech providers, schools (or districts and states) pay for access to an edtech solution in stages, with each stage being

Figure 1. Illustration of the edtech ecosystem.



contingent upon the edtech company demonstrating positive educational impact. Impact funders and dedicated outcomes funds, for example, the Education Outcomes Fund, have shown that outcomes-based implementation of edtech in Global South interventions led to students' higher scores (for example, in Sierra Leone, Bridges Outcomes Partnerships, 2024).

Another pathway is regulation of the edtech sector by national governments, which can ensure that only edtech providers whose products meet certain quality criteria are allowed to enter public contracting. While regulations have been discussed but not implemented at the time of writing, there is burgeoning interest in certifications of edtech quality: several certification providers (for example, EdTech Impact in the UK, EdTech Tulna in India and Digital Promise in the USA) provide edtech companies with certifications of quality when these companies fulfil certain requirements. Schools tend to favour tools that are externally verified by trusted certification providers, as these ensure that the technology aligns with established standards, and thus that its implementation is more likely to meet quality and safety standards. Schools use certifications to inform their decisions, while companies use them to signal the quality of their products. As such, certifications serve as a form of light, unofficial regulation that companies and schools can choose to follow.

The third pathway is the establishment of dedicated research and development edtech centres. Such centres propel a shift towards a new model of generating and disseminating academic research, facilitated through advanced, rapid cycles of evaluation that focus on specific R&D topics in edtech. The Centres draw on academic knowledge but operate outside traditional academic structures, thus avoiding teaching and citizenship obligations. Functioning as a dedicated research and development agency, the AERDF initiative in the USA is an example of how to spearhead innovation through dedicated research and development through government-backed initiatives.

Figure 1 illustrates the three proposed pathways – accountability (with, for example, outcomes-based contracting), regulation (through, for example, certifications) and innovation (through, for example, research and development centres).

The emergence of these mechanisms worldwide signals a global opportunity for the academia–industry ecosystem to thrive. Their activation depends on all ecosystem members – teachers, researchers, industry leaders, investors, policymakers and edtech users – working together. By doing so, we can tackle the critical challenge of edtech not yet fulfilling its potential to address the global learning crisis and improve children's learning outcomes worldwide.

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Consent for publication statement

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References

Baker, R.S., Boser, U. and Snow, E.L. (2022) 'Learning engineering: A view on where the field is at, where it's going, and the research needed'. *Technology, Mind, and Behavior*, 3 (1). https://doi.org/10.1037/tmb0000058.

Bond, M., Khosravi, H., De Laat, M., Bergdahl, N., Negrea, V., Oxley, E., Pham, P., Chong, S.W. and Siemens, G. (2024) 'A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour'. *International Journal of Educational Technology in Higher Education*, 21 (4), 1–41. https://doi.org/10.1186/s41239-023-00436-z.

Bridges Outcomes Partnerships (2024) 'Groundbreaking outcomes-based initiative improves education in Sierra Leone, highlighting wider potential', 13 December. Accessed 24 March 2025. https://bridgesoutcomespartnerships.org/groundbreaking-outcomes-based-initiative-improves-education-in-sierra-leone-highlighting-wider-potential/.

Cukurova, M., Luckin, R. and Clark-Wilson, A. (2019) 'Creating the golden triangle of evidence-informed education technology with EDUCATE'. *British Journal of Educational Technology*, 50 (2), 490–504. https://doi.org/10.1111/bjet.12727.

Dolan, B. (2000) 'Universal design for learning'. *Journal of Special Education Technology*, 15 (4), 47–51. https://doi.org/10.1177/016264340001500407.

Dore, R.A., Shirilla, M., Verdine, B.N., Zimmermann, L., Golinkoff, R.M. and Hirsh-Pasek, K. (2018) 'Developer meets developmentalist: Improving industry–research partnerships in children's educational technology'. *Journal of Children and Media*, 12 (2), 227–35. https://doi.org/10.1080/17482798.2018.1450086.

Druin, A. and Kolko, J. (2017) 'Conversation: Participatory design in research and practice'. In B. DiSalvo, J. Yip, E. Bonsignore and C. DiSalvo (eds), *Participatory Design for Learning: Perspectives from practice and research*. New York: Routledge, 189–201.

EdTech Hub (2022) *Sandbox Handbook V.2.0*. EdTech Hub, 24 August. https://doi.org/10.53832/EdTechhub.0108.

Edwards, M.A. and Roy, S. (2017) 'Academic research in the 21st century: Maintaining scientific integrity in a climate of perverse incentives and hypercompetition'. *Environmental Engineering Science*, 34 (1), 51–61. https://doi.org/10.1089/ees.2016.0223.

EEF (Education Endowment Foundation) (2025) 'Evidence and resources'. Accessed 2 April 2025. https://educationendowmentfoundation.org.uk/education-evidence.

Egert, F., Cordes, A.K. and Hartig, F. (2022) 'Can e-books foster child language? Meta-analysis on the effectiveness of e-book interventions in early childhood education and care'. *Educational Research Review*, 37, 100472. https://doi.org/10.1016/j.edurev.2022.100472.

Francisco, A. and Epstein, B. (2017) 'Limited evidence in edtech: Everyone agrees – it isn't their fault'. Digital Promise, 13 June. Accessed 2 April 2025. https://digitalpromise.org/2017/06/13/limited-evidence-edtech-everyone-agrees-isnt-fault/.

Hirsh-Pasek, K., Zosh, J.M., Golinkoff, R.M., Gray, J.H., Robb, M.B. and Kaufman, J. (2015) 'Putting education in "educational" apps: Lessons from the science of learning'. *Psychological Science in the Public Interest*, 16 (1), 3–34. https://doi.org/10.1177/1529100615569721.

Holliman, R. and Warren, C.J. (2017) 'Supporting future scholars of engaged research'. *Research for All*, 1 (1), 168–84. https://doi.org/10.18546/RFA.01.1.14.

IES (Institute of Education Sciences) (2025) 'What works clearinghouse'. Accessed 2 April 2025. https://ies.ed.gov/ncee/wwc/.

Kolodner, J.L. (2023) 'Learning engineering: What it is, why I'm involved, and why I think more of you should be'. *Journal of the Learning Sciences*, 32 (2), 305–23. https://doi.org/10.1080/10508406.2023.2190717.

Kong, S.C. and Lin, T. (2022) 'High achievers' attitudes, flow experience, programming intentions and perceived teacher support in primary school: A moderated mediation analysis'. *Computers & Education*, 190, 104598. https://doi.org/10.1016/j.compedu.2022.104598.

Kucirkova, N. (2017) 'iRPD – A framework for guiding design-based research for iPad apps'. *British Journal of Educational Technology*, 48 (2), 598–610. https://doi.org/10.1111/bjet.12389.

Kucirkova, N.I. (2023) 'Why the edtech evidence movement needs an open data repository'. EdTech Digest, 26 January. Accessed 2 April 2025. https://www.edtechdigest.com/2023/01/26/why-the-edtech-evidence-movement-needs-an-open-data-repository/.

Kucirkova, N. (2024) 'A partnership industry for impactful Ed-Tech'. *Stanford Social Innovation Review*, 22 April. https://doi.org/10.48558/58NS-6760.

Kucirkova, N. and Cremin, T. (2024) 'Funds of courage: Advancing social justice in children's reading for pleasure'. *Cambridge Journal of Education*, 54 (4), 437–54. https://doi.org/10.1080/0305764X.2024.2369576.

Kucirkova, N. and Dockterman, D. (2024) 'Towards a holistic understanding of evidence: A working paper'. Stavanger: University of Stavanger. https://doi.org/10.31265/USPS.284.

Kucirkova, N., Messer, D.J. and Sheehy, K. (2019) 'Investigating the effectiveness of the Our Story app to increase children's narrative skills: Lessons learnt from one English preschool classroom'. In E. Veneziano and A. Nicolopoulou (eds), *Narrative, Literacy and Other Skills Studies in intervention*. Amsterdam: John Benjamins, 245–61.

Livingstone, S., Orben, A. and Odgers, C. (2023) 'Debate: Should academics collaborate with digital companies to improve young people's mental health?' *Child and Adolescent Mental Health*, 28 (1), 150–2. https://doi.org/10.1111/camh.12630.

Luckin, R. and Cukurova, M. (2019) 'Designing educational technologies in the age of AI: A learning sciences-driven approach'. *British Journal of Educational Technology*, 50 (6), 2824–38. https://doi.org/10.1111/bjet.12861.

Meyer, M., Zosh, J.M., McLaren, C., Robb, M., McCaffery, H., Golinkoff, R.M. and Radesky, J. (2021) 'How educational are "educational" apps for young children? App store content analysis using the Four Pillars of Learning framework'. *Journal of Children and Media*, 15 (4), 526–48. https://doi.org/10.1080/17482798.2021.1882516.

Oliveira-Duarte, L., Reis, D.A., Fleury, A.L., Vasques, R.A., Fonseca Filho, H., Koria, M. and Baruque-Ramos, J. (2021) 'Innovation ecosystem framework directed to Sustainable Development Goal# 17 partnerships implementation'. *Sustainable Development*, 29 (5), 1018–36. https://doi.org/10.1002/sd.2191.

Pitchford, N.J., Chigeda, A. and Hubber, P.J. (2019) 'Interactive apps prevent gender discrepancies in early-grade mathematics in a low-income country in sub-Sahara Africa'. *Developmental Science*, 22 (5), e12864. https://doi.org/10.1111/desc.12864.

Rajasekaran, S., Adam, T. and Tilmes, K. (2024) *Digital Pathways for Education* (No. 42386). The World Bank Group. Accessed 2 April 2025. https://openknowledge.worldbank.org/entities/publication/9673fd74-1bf4-4693-b45f-374a64464c63.

Roskos, K., Burstein, K., Shang, Y. and Gray, E. (2014) 'Young children's engagement with e-books at school: Does device matter?' *Sage Open*, 4 (1), 2158244013517244. https://doi.org/10.1177/2158244013517244.

Schiuma, G. and Carlucci, D. (2018) 'Managing strategic partnerships with universities in innovation ecosystems: A research agenda'. *Journal of Open Innovation: Technology, Market, and Complexity*, 4 (3), 25. https://doi.org/10.3390/joitmc4030025.

UNESCO (United Nations Educational, Scientific and Cultural Organization) (2023) *Technology in education: A tool on whose terms?* GEM Report. Accessed 24 March 2025. https://www.unesco.org/gem-report/en/2024pacific.

US Department of Education (2025) 'Fostering educational excellence and ensuring equal access'. Accessed 2 April 2025. https://tech.ed.gov/essa/.

Vanbecelaere, S., Adam, T., Sieber, C., Clark-Wilson, A., Boody Adorno, K. and Haßler, B. (2023) *Towards Systemic EdTech Testbeds: A global perspective*. London: GETN. Accessed 24 March 2025. https://lirias.kuleuven.be/retrieve/711286.

Wadhwa, M., Zheng, J. and Cook, T.D. (2024) 'How consistent are meanings of "evidence-based"? A comparative review of 12 clearinghouses that rate the effectiveness of educational programs'. *Review of Educational Research*, 94 (1), 3–32. https://doi.org/10.3102/00346543231152262.

World Bank Group (2025) 'Global Education Evidence Advisory Panel'. Accessed 2 April 2025. https://www.worldbank.org/en/topic/teachingandlearning/brief/global-education-evidence-advisory-panel.