Edtech procurement matters:

It needs a coherent solution, clear governance and market standards

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EDTECH PROCUREMENT MATTERS: IT NEEDS A COHERENT SOLUTION, CLEAR GOVERNANCE AND MARKET STANDARDS

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ABSTRACT

Digital technologies have come to mediate every educational process - from operations and management to teaching and assessment. While scholarship surrounding the threats and opportunities from digitalising education continues to grow, little is known as to how education technology (edtech) products come to be adopted as safe and beneficial to education and individuals. Much rhetoric circulates in media with narratives and anecdotes on how and what edtech can do. Mr P ICT, a primary school teacher, offers teacher training on what and how to use edtech. Sokanu (Schindelheim, 2021), an assessment platform, claims to provide career and degree matches based on unique personality traits. Century Tech promises to detect autism and boasts (Delgado, 2019) about its enrolment in 700 schools in Belgium (when it never did[i]). Given the unprecedented challenges the Covid-19 pandemic caused to schools globally, the underpinned urgency of providing education has led to hasty government decisions to utilise – and bring in more – edtech (UK Department for Education, 2020; Bozkurt et al., 2020). Yet, this hodgepodge of decisions, driven by the perception that edtech will help fix whatever is perceived as broken in education (Teräs et al., 2020), leaves pressing questions unanswered. Specifically, who decides what edtech products will be adopted in schools? What benchmark is used to make such decisions? Who assesses what edtech vendors deliver against their claims? Are there any criteria used to recognise when an edtech product fails and who decides what those are? Who is held responsible if/when edtech products fail?[ii] Driven by the need to answer these questions, this paper reflects substantial work in progress and brings forward initial findings from qualitative research conducted with some of the main stakeholders in the education sector: data privacy officers (DPOs), school leaders, edtech providers, edtech product procurers, consultants and investors.

Keywords: edtech, data privacy, edtech procurement, children, education

1. INTRODUCTION

Following the unprecedented year and a half of lockdowns and disrupted life due to the Covid-19 pandemic, debates about education and the role of edtech in it continue to intensify. No access to education deepens the digital divide and buries the poor deeper into poverty, critics lament on one end (Roese, 2021). Advancing data-extractive systems enable student surveillance and diminish basic human rights, warn others (Lupton and Williamson, 2017). Yet others stress that edtech solutionism offers little evidence of its effectiveness (Boninger, Molnar and Saldaña, 2020). At best, edtech businesses make a salesman's pitch (Teräs et al., 2020) that is driven mainly by company interests seeking new markets (Williamson, 2021).

The common need, it seems, is the delivery of quality education, whatever that looks like. Suggestions have come from the pure abstract, like re-imagining 'deep learning' (Fullan et al., 2020), to the concrete – governments contracting Microsoft, Google and others to mediate education (DfE, 2020; Bozkurt et al., 2020).

Within these proposals, technologies have remained lumped together. No distinction is made between those that provide mere connectivity and access to content and those that have the capacity to exert pedagogical power (Hillman, 2022) without being held accountable for how they work, what they do and who benefits. Moreover, within this lump are also advancing digital systems which show capacity to influence decision-making (Straumsheim, 2015; Hillman and Bryant, 2022), profile and control individuals and diminish their basic rights and freedoms (Andrejevic and Selwyn, 2020). This begs the question of what kinds of edtech products are mediating education processes exactly? Who chooses them and according to what criteria, benchmarks or standards? What mechanisms are in place that govern, control and ensure that these products serve children's best interests and contribute pedagogically?

1.1. Edtech is a business like any other; it is in the business of what?

An important point must be laid out at the start: the edtech sector, by its very nature, is a business stream like any other. This leads to the question: as businesses, what are edtech companies' motivations in the education sector? Even if companies are motivated by improving educational processes, any such goal must also make business sense – make money. So, if Google give free Chromebooks to children (Elias, 2020), what business model sustains this generosity? There can be at least two speculative answers, based on what has been witnessed in the wider technology sector. These are the motivation to attract investment and the motivation to sell a product, whatever that may be.

Investment in the technology sector has taken a particular direction recently. Harvard professor Shoshana Zuboff argues that the surveillance capitalism model of extracting data surplus from users of digital technologies has greater value than the technologies themselves, what she calls surveillance dividend (Zuboff, 2019). If, say, a car can generate tons of data because it is wired with almost 15 cameras (Duong, 2019), the incentive is no longer to sell the car alone; the car can even be given for free. The data that the installed cameras collect become the surveillance dividend that is of value to investors. Thus, investments increasingly flow into companies that not only develop new digital applications and products but also offer surveillance dividends (Zuboff, 2019). It is not the products that the company sells that brings the most value, but the data extracted from their use. Therefore, successful is that business model which attracts the most investment. Or as one edtech investor puts it bluntly: the toughest part of investing in innovation is to know "which new ideas will scale and deliver consistent and increasing revenue, ROI and profitability?" (Palmer, 2022, n.p.).

The second motivation is to sell a product, not just any; one that promises business growth. As Zuboff points out (2019), in the technology sector, business growth is found in the growing data cache surplus that is above and beyond the data applied to service improvement. The data surplus is converted into proprietary behavioural surplus, incorporated into algorithmic intelligence, packaged as prediction products and sold as information about what users are likely to do now, soon or later into the future. Many examples demonstrate this model. Pokémon Go, the augmented reality game incubated at Google, manipulated their online players to move physically around their towns and collect virtual items. The free-to-use game emulated the logic of surveillance capitalism by making the company sell the so-called footfall advertising – the number of people who physically visit an advertiser's premises (e.g., Pokémon Go players passing via McDonald's, the fast-food restaurant [Abrams, 2016]). Within this manipulation, players are completely ignorant to what is being done to them (Zuboff, 2019). Similarly, Facebook sold information to advertisers about when young adults in Australia would feel the most vulnerable – stressed, fatigued or anxious – and the exact moment when they would need a confidence boost (Levin, 2017). However, commercial success is only one direction manipulation can take. Cambridge Analytica, the consulting firm, collected the personal data of millions of Facebook users without their consent to use for political advertising and manipulate users' voting behaviour (Confessore, 2018). And so, the camera-wired car, the online game and the social media platform become a Trojan Horse that collect data about individuals, enabling their manipulation, which is then packaged to sell.

This leads to another question: if these are nothing more than speculations, what oversight is in place to prevent these business motivations from happening in education? Therefore, it

becomes relevant and necessary to identify the conditions and regulations the edtech sector, like any other business, are subject to. If, say, finance companies and advertising agencies are subject to specific regulation and licensing (the Financial Conduct Authority [FCA], the Advertising Standards Authority [ASA] respectively), so should edtech businesses. The healthcare system in the UK regulates and licenses operators to ensure patients' safety and care (Care Quality Commission, 2009; the Medicines and Healthcare Products Regulatory Agency, 2020). The online gaming sector in the European Union (European Standards, 2020) too provides for monitoring, audits and control as well as duty of care to gamers (European Committee for Electrotechnical Standardisation [CENELEC], 2021). Within this context, the edtech sector not only may target underage individuals but also claim the privilege to provide a service for something considered a human right (United Nations Convention on the Rights of the Child [UNCRC], 1989). Yet, the edtech sector continues to grow with little meaningful oversight, code of practice and clear evidence of their value to education.

While the business of edtech necessitates further research, this working paper addresses primarily the question of edtech procurement and some of the key stakeholders who choose, evaluate and offer edtech products. It identifies the expectations and the practices in edtech procurement and identifies substantial gaps in the process as a result of the lack of clear standards, benchmarking and sector-specific regulations.

2. LITERATURE REVIEW

The paper adopts two frameworks within which the questions about edtech procurement and evaluation are analysed. The first framework makes emphasis on education and learning. The second one focuses on the agentic child and education as their human right.

2.1. Edtech's contribution to education

If education is understood as a social structure, which determines the process of what is taught, how it is taught and what is learned (Dornbusch, Glasgow and I-Chun Lin, 1996), the focal point rests on the learners for whom these processes work for them to learn. Here edtech products have come to claim the capacity to aid and improve these processes. However, as the new semantics of AI, augmented reality, virtual reality, data-based decision making, applications, platforms and so on continue to occupy the education discourse, they are gradually shifting away from that focus. For example, the discussions surround data collection for predictive analytics; less so what real choice the learner has in a platformised educational institution (Hillman, Martins and Ogu, 2021). Following the Covid-19 pandemic, the sense of urgency has led to hasty patchwork of platformisation (Pangrazio, Selwyn and Cumbo, 2022) and blurring the lines between what should be considered sacred domain where a child learns (Hillman, 2022) and the adult market of money making (Williamson, 2021).

In defining the role of an educational institution, and for the purpose of this work – in evaluating edtech – Howard Gardner's theory of multiple intelligences (1983/2011) lends an understanding of the unique kinds of learners that all individuals are. Acknowledging that everyone learns in a unique way, helps to gain insight into the "puzzles of learning" but also "clues to the creation" (Gardner, 1995/2011, 7) of effective educational systems. And here is the tricky part: some edtech products have begun to offer precisely that – a deep dive into an individual, by collecting more data for inferential diagnostics and predictive analytics. The misunderstanding, however, is that educational institutions have continuously and historically ascertained specific purposes which have acted as extrinsic constraints to the learner.

> *From the need to teach literacy to large numbers of young students to the pressures for turning out citizens who embody certain attitudes and virtues, schools reflect these constraints. The relative absence in schools of a concern with deep understanding reflects the fact that, for the most part, the goal of engendering that kind of understanding has not been a high priority for educational bureaucracies.* (Gardner, 1995/2011, 8)

Much earlier than Gardner, Ivan Illich and Etienne Verne (1976) argued about the "defects of the school system" (9) whereby industrial societies altered the idea of education by which

> *they meant the manipulation of children by adults using a programmed instrument called the school. In permanent education we are no doubt witnessing a further reduction of the idea of education, this time for the exclusive benefit of the capitalists of knowledge and the professionals licensed to distribute it. (Illich and Verne, 1976, 13)*

And so edtech products enter a context, one might argue, of far-from-resolved deep-seated problems and of certain "disciplinary and epistemological constraints that have come to operate within [schools] over the years" (Gardner, 1995/2011, 9). In other words, edtech products begin to work in an already flawed system. Unlicensed.

The learner exhibits performances that reflect the extrinsic constraints (what is taught, how it is taught and what is learned) determined by the educational institution. As the learner displays an understanding by performing, the erroneous belief is that the learning process works – the learner learns. Many edtech products emulate this process: a child recalls facts and answers; an application diagnoses and displays the outcome on a digital dashboard. Learning is recorded on some kind of scale as some kind of learning achievement. Much of the edtech products encourage this sort of learning – one that is performed. However, this kind says nothing about learners' genuine understanding and abilities to apply the acquired information and skills appropriately and flexibly. In other words, gaps continue to persist between the expectations in schools for learners to acquire knowledge and become a domain expert and exhibit mastery of applying that knowledge above and beyond the school walls. Gardner states:

> *Yet it is crucial to appreciate that the two understandings [an intuitive learner and a disciplinary expert] are of a fundamentally different order. In the intuitive case, one is encountering the natural but naïve understandings that have evolved over the centuries to yield a reasonably serviceable first-order grasp of the world. In the case of the disciplinary expert, one is encountering understanding that have arisen on the part of scholars and artisans who have worked in a self-conscious and cumulative fashion in their respective disciplinary preserves. (Gardner, 1995/2011, 11).*

This framework positions learning as one that goes beyond the mere acquisition and demonstration of knowledge and thus questions the limitations of educational institutions that

drive this sort of learning. It follows that if edtech products are meant to support the same institutional goals, this framework can equally highlight edtech products' own shortfalls.

Cognitive research documents the extent to which children exhibit different kinds of minds and learning ways. Gardner's theory of multiple intelligences (1983/2011) brings to light a framework of thinking about education (and about the institutions providing it). Some individuals, Gardner stresses, take linguistic approach to learning. Others favour a spatial or quantitative approach. Yet other learners perform best through tactile manipulation of materials and symbols, using hands-on, or when interacting physically with others. To this end, it remains unclear how the different frames of mind – multiple forms of intelligences – are mobilised, underpinned and enabled by edtech products. How, say, Dr Frost, an application that provides practice and assessment in mathematics and allows schools to track students' learning progress, caters for all these different frames?

At best, the framework of multiple intelligences proposes a way to evaluate edtech products. In practice, they are not. This leaves educational institutions to look like a hodgepodge of products and processes, with expectations that an educated person comes out the other end with, not necessarily a different point of view and the ability to apply knowledge, but certain marketable skills that, sometime in the future, industry would hopefully need.

Crucially, edtech products are mostly about the technique of how to provide education. In 1970s Neil Postman and Charles Weingartner argued that, at least in much of the Western societies, 99.9% of all the public hollering about education was about the technique (Postman and Weingartner, 1973). There is plenty of evidence that in 2022 it still is. But technique says nothing about the values or the content it aims to impart. The focus has moved so past the individual towards the advancing machinations of efficiency, what digital technologies are at their core, that little to nothing is said about what these produce; even less so – who should say what they are expected to produce. An algorithm dressed in a colourful web interface promising to teach all children in the world to become excellent coders is an ambitious business (and policy) goal. But this does not answer whether that is what is worth achieving and whether that is what every single child in the world aims for. These become futile philosophical questions that find no use in today's growing market of edtech products. However, they can point to a gap that edtech products have not filled in yet. At least there is no evidence to the contrary.

And for that, edtech products demand a critical pedagogic view of how they may impact what is conceptualised as learning and what should be understood as an educated individual.

Ultimately, edtech products are basing their functionalities on existing institutional needs and aim to meet prescribed policy goals for children's education. Therefore, part of the responsibility from policy, legislative, institutional and industry perspective is to evaluate their quality and ensure that they meet these goals.

2.2. Edtech products and children's rights

The second framework guiding this working paper adopts the children's rights context (UNCRC, 1989) and explores children's participation, risks and sense of control over edtech. According to the UNCRC (1989), every child is entitled

> *…to an education to support the development of their full potential (Art. 28) and prepare them 'for responsible life in a free society' (Art. 29), to recreation and leisure appropriate to their age (Art. 31), to diverse material of social and cultural benefit to the child (including minorities) to promote children's well‑being (Art. 17) and all appropriate measures for recovery from neglect, exploitation or abuse (Art. 39) (Livingstone, 2015, 23).*

However, as scholars maintain (Jaunzems et al., 2019), the provision to support children's rights to education and prepare them to become responsible and independent adults within a 'free society' has yet to acknowledge the impact of digital inferencing systems that have the capacity to steer individuals without their awareness (Breiter and Hepp, 2018). Additionally, a student has limited or no choice but to sign into the classroom technologies and prevent behavioural tracking by third parties (Bailey, Laakso and Nyman, 2019).

This research stems from a simple premise: unlicensed bus drivers will never drive the school bus; why should unlicensed edtech products mediate educational processes? Behind 'licensing' lie agreed upon rules, conditions, terms, standards, methods and expectations. For the bus driver, or the school nurse, those are relatively known. But what are they for an edtech product that teachers already use to track students' learning progress, or for an application that diagnoses a child's mental health, or for a platform that makes career recommendations?

This work does not aim to deny the good intentions and opportunities edtech products can offer but to identify meaningful governing and regulatory mechanisms which can ensure that they do.

3.   FINDINGS AND DISCUSSION

The data underpinning this work comes from interviews with a number of key stakeholders: DPOs from the UK who provide audit and procurement of edtech products and vendors, industry representatives (edtech providers, developers and investors) and school leaders. I reviewed extant data from case studies, regulatory regimes, newly introduced policies, procedures and standards such as the Age-Appropriate Design Code (ICO, 2021), the ethics grade benchmark rating (Ethics Grade, n.d.) and various regulatory frameworks from unrelated to education sectors such as the healthcare, advertising, finance and online gaming sectors (Medicines and Healthcare Products Regulatory Agency, 2020; Paraskeva, 2017; ASA, 2018; FCA, 2022, European Committee for Electrotechnical Standardisation, 2021).

Additionally, I co-organised a multi-stakeholder event at the London School of Economics and Political Science, where policymakers, academics, researchers, edtech providers and data privacy officers discussed and anticipated issues relating to the relative lack of regulation, standards and benchmarking for the edtech sector.

Lastly, I also carried out in-depth conversations with several organisations and initiatives in the European Union (EU), US, UK and Australia including with the Student Data Privacy Consortium (SDPC, 2018, 2021), which vets edtech vendors across the US; the National Student Interoperability Program (NSIP), which procures edtech vendors across all states and territories in Australia, and the European Edtech Alliance comprising edtech vendors from across the EU. Figure 1 maps the discussions and key questions stakeholders were asked.

Figure1: Mapping the discussions with various stakeholders

Type	Number	Region	Key questions
DPOs, school leaders	21	UK, USA	What are the benchmarks, policies, procedures and frameworks used to evaluate and choose edtech products and services? What are the challenges in procuring edtech products?
Policymakers	2	The Director for Innovation, Digital Education & International Cooperation at DG EAC Former Chief Executive Officer of a Gaming Authority (undisclosed country)	What are the present and anticipated strategies for governance and regulation of the edtech sector? What are the strengths and weaknesses of the forthcoming legislative packages with regards to the edtech market? How is the gaming sector regulated and how are gaming operators audited to ensure they comply with the regulations?
Edtech procurers / freelance consultants	12	UK, USA	What are the benchmarks, rules and procedures that you use to evaluate an edtech product or provider? What benchmarks do you use to recommend/procure edtech for schools?
Edtech operators	24	UK, USA, EU	What are the benchmarks, rules and procedures that you are guided by? What benchmarks do schools/policy require from you to demonstrate? What are your thoughts on /do you welcome a standard form of regulating and evaluating the edtech sector?
Edtech investors	3	UK, USA	What are the primary considerations edtech investors make before deciding to finance an edtech company? What do you look for in an edtech product and in the company? What companies have you invested in and why?

The following themes emerged as a result of this research.

3.1.   Education stakeholders need a standard to understand and choose edtech products with ease

There is no coherent framework for edtech procurement. The role of DPOs (within the UK and EU contexts), edtech freelance consultants and procurers, and school leaders (in the case with the US) is to support decisions about the choice of edtech products to buy into and use. DPOs in the UK seek to establish whether edtech vendors adhere to data privacy conditions set forth by the General Data Protection Regulation (ICO, 2021). In the US, in the example of the interviewed school district (Cambridge, MA) a special consortium is set up (SPDC, 2018) to vet edtech products by using specially developed data privacy contractual agreements (obliging vendors to adhere to the Family Educational Rights Protection Act [US Department of Education, 2011]). While this sounds like a straightforward task, DPOs and school leaders say it is not. First, it is not mandatory for edtech vendors to undergo assessments. They

voluntarily choose to opt in. The more prominent and powerful companies (e.g., Google, Adobe etc.) tend to resist any such assessments.

Second, schools often buy into edtech products before an assessment has been done. As one DPO says, school and vendor "have already sealed the deal…there's no motivation for the vendors to undergo a risk assessment". Teachers, too, may opt for a new application without the consortium (in the case with the Cambridge school district) has had a chance to vet the vendor.

Third, edtech vendors' understanding of GDPR provisions can vary widely. For example, one officer says that

> *some providers have wild terms and conditions and such wacky interpretations of the GDPR, some picking and choosing as to which articles of the GDPR they fancy complying with.*

Another one adds, "some don't even bother saying anything at all about data protection; they just put 'in accordance with GDPR' at the end of every line of the contract and think that that suffices". Yet others emphasise the challenges of having "ten different variations of a due diligence questionnaire…"

On one hand, this process makes it harder for vendors because "one could spend all day responding to very slightly different due diligence questionnaires". On the other, it makes it hard for schools "who don't know what to ask of and expect from vendors in terms of compliance" – everyone answers different things. On top of this, new edtech products appear on the market all the time. One DPO in the UK says, "quite often new vendors that are around are coming in from overseas. They've got less history with UK education in general". This adds to the complexity of conducting risk assessments while also introducing overseas companies to the local culture.

3.2. There is a lack of benchmarks and standards across the edtech sector at national levels

A DPO in the UK who has been in education for over 20 years says that his work encompasses many strands: from helping edtech vendors better communicate with schools to helping the

Department for Education (DfE) with the development of a data protection toolkit for schools.
As the DPO says

> *part of that work has been what can be a standard model…something that
> would lead to answering the question of what good edtech look like, because
> that's one of the questions that still hasn't been answered.*

As it stands today, a possible answer to this question would be, as the DPO suggests, "well,
something like, there's a bit of this and there's a bit of this and, it's hard to sometimes pin that
down". The bigger problem, however, is that finding a standard model that unifies the various
needs of schools, edtech vendors, DPOs, and importantly children and their parents, would
be a "low priority" to the DfE because the responsibilities of edtech procurement and selecting
the "good" edtech products remains in the hands of schools. In the US, too, schools remain
responsible for product procurement and what gets to be used. This leads to the question of
liability: who remains responsible when these products fail?

3.3.   Unregulated market increases the liability risks for schools

The nature of the market allows many products to enter schools with unproven concepts. As
one edtech consultant says,

> *I get asked how do I sell this product to schools so I rarely get asked
> specifically to look at data protection. This is kind of is on me – I also need
> to know if the product makes pedagogical sense.*

From an administration point of view, the consultant adds, the product makes sense, however,

> *while there are teaching awards and best innovator categories around the
> country where you can get to see what product is good pedagogically; the
> biggest problem is that bridging that gap across the industry isn't happening*

Schools lack the "full view of who the good vendors and products are" on the market. When
there is no systematic way of knowing what products are good across categories that go
beyond the legal compliance, "schools become even more distrustful of technical stuff". It also
"becomes harder and harder for even those companies who do want to do it all right." A DPO

sums it up: "One of the challenges is the lack of coherent guidance for schools". In a vicious cycle, the lack of knowledge and guidance increases the schools' liability risks.

3.4. There is an overall need for a transparent communication across the board

One of the biggest challenges is the transparency and easy flow of communication across all education stakeholders relating to edtech matters. The lack of coherent and single standard of vendor audits and procurement further exacerbates the confusion. For instance, an edtech vendor may have undergone due diligence on a more technical check. However, if schools lack the technical expertise, they will want to look more at the legal aspects of a contract as a way of understanding what they are buying into. The disparity of what is available as information about a vendor then fuels issues with regards to disseminating and accessing it across all stakeholders. As one DPO says, "somebody then also has to help schools understand all this" adding that "it's one of those things where there's huge lack of central focus for schools".

At a legal and technical level, products' functionalities change. Companies may, from time to time, update their terms and conditions. Some may even be acquired by other companies (e.g., Naviance, owned by Hobson, is a data- collecting platform, which until it was sold to PowerSchool, a US edtech, in February 2021, was a division of the *Daily Mail* and General Trust in the UK [Reuters, 2021]). This can lead to changing headquarters and jurisdiction entirely (which leads to further questions about the fate of the already collected student data in the hands of the new owner). Such important information may directly affect individuals and yet it may not come to their attention easily or at all.

Lastly, at a personal and pedagogic level, little is known about students' and teachers' views and experiences with edtech products. What products give pedagogic value to teachers (and not mere efficiency)? What products do students like or dislike? While some question whether students have any say and real choice in edtech use (Hillman, Martins and Ogu, 2021), there is an overall lack of communication across the board about the pedagogic value of edtech products beyond the hearsay ("the school down the road says the app is 'good'").

There are online entities that offer edtech product reviews (see for example EdSurge's Product Index [n.d.] or the reviews and rankings of CommonSense Media [n.d.]). These resemble TripAdvisor and Amazon style customer feedback. Product reviews are a significant factor that affect search rank algorithms – they give online visibility to a product and its company

(Proserpio, Hollenbeck and He, 2020). Positive reviews build public trust and affect buying decisions (Lackermair, Kaller and Kanmaz, 2013). However, while online visibility benefits first and foremost vendors and their need to sell, such reliance on customer metrics and opinions leaves many more questions unanswered. For example, who is the customer reviewing the edtech product? What criteria have they used? What are their expectations? Edtech product reviews are the expressions of customers' personal perceptions. However, these say nothing about the vendor's security controls and standards used, data processing and use, human resources and their pedagogic expertise, ethics and company values and so on. Research shows that while perceived as important, reviews can be time-consuming for the buyer to process texts and contexts (Lackermair, Kaller and Kanmaz, 2013). Reviews can also be unreliable and even harmful because of fraudulent practices of manipulating reputation systems with fake product reviews (He, Hollenbeck and Proserpio, 2021). Put otherwise, opinions (where authentic) can be as many as there are people on earth (what would explain why Shakespeare's Hamlet has only two stars on Amazon [Beaton, 2018]!).

To address this lack of clear evidence and benchmarking in the sector, some edtech vendors have started to form alliances who convene discussions about ethical practices and developing evidence base of edtech products' impact in education. Examples include the EdSafe AI Alliance and the European Edtech Alliance in the EU, and the Edtech Evidence Group in the UK. However, it is yet to be understood what their criteria and objectives are: how independently of any business interests are these formed; how they address and reflect children's rights and freedoms; and how effectively they are communicated across all stakeholders including students, parents and teachers.

3.5.   Roles and responsibilities with regards to edtech products remain unclear

In the attempt to unpack where responsibilities lie when things go wrong with student data what surfaced is that an incoherent ad hoc effort dilutes the responsibility amongst some of the main stakeholders involved in the procurement process including schools, districts, councils, freelance consultants, and even teachers and social media (eg., Mr P ICT promotes his expertise to teachers online). Additionally, it is understood that edtech vendors also tend to take the blame for the growing granularity of data collection and the emanating risks. But many DPOs insisted are forced by their clients – schools – to do it.

> *The schools will say they need this, they want that, they want these*
> *categories of data, they need to have pulled in ethnicity, religion and columns*

*of other data…so the vendor does it because that's what their customer is
telling them to do, and they [schools] are saying, we won't buy it [the vendor's
product] if you don't do this.*

For example, a consultant explains that, to support more disadvantaged children, the Office
for Standards in Education, Children's Services and Skills, Ofsted, demands that schools
collect data that can help identify who they are and distribute necessary resources well. Such
data are further expected to help estimate the returns on this extra resource investment. The
consultant adds,

*because of the Ofsted pressures…the onus is on the school to know where
those children are and what they're doing with those resources. So, they [the
schools] are asking for that, from an edtech vendor perspective.*

3.6.   Schools do not necessarily have the expertise and they cannot always afford it

Teachers and students are not merely expected to know how an edtech application or platform
works. While their roles and responsibilities remain unclear (do they just know how the
application works? How does one use the diagnostics presented by an application? Is there
an accepted school policy with regards to the use of edtech data and diagnostics? Are there
agreed codes of practice and expectations from all teachers within an educational institution
when it comes to the use of edtech products? Is a teacher at risk of losing his job if he chooses
not to use a certain application, does not know how to or even opts to rely on the product most
of the time with some of his students (what are the criteria to decide on that and who decides
it))? These and more questions emerge as I seek to unpack the more practical side of edtech
adoption in the classroom. To these questions, one edtech consultant says:

*education is a big part [of the issues]; from the schools' point of view a big
part of the data protection is just learning the tech. A big challenge for schools
is teachers even being able to use the technology, let alone to be able to pick
it apart and figure [it] out.*

To this end, DPOs as well as an entity like the SDPC in the United States set up specifically
for edtech vetting and procurement, provide as much support to schools as possible – through
training, information and edtech procurement. But the lack of coherence (when schools buy

into a product that has not had its impact assessment yet or a teacher simply decides to choose a new and exciting application in class one day), and the added responsibility to schools to understand the risks emanating from data and technologies (while such knowledge also takes time to build) calls for rethinking meaningful and coherent solutions in procurement. As one DPO says, "we know we need a standard…something needs to be put together".

Similarly, within the Australian context, the NSIP carry out technology assessments across cybersecurity guidelines (Safer Technologies for Schools Assessment [ST4S], 2021). Yet again because of the voluntary basis on which this auditing across cybersecurity assessment is conducted, some of the biggest players in the sector refuse to go under the microscope. Crucially, there is little consideration with regards to evaluating edtech products on other levels such as their value to pedagogy and learning.

3.7. There is a need for all edtech companies to adhere to commonly agreed policies, terms and conditions within national contexts

While not exhaustive, the preliminary findings help to drive further discussions and research into possible next steps that address the gaps in edtech procurement and benchmarking. Edtech oversight should be a policy priority where the assumption should not be that regulation will stifle innovation because it is a relatively new sector but that ensuring open standards exist that will drive innovation in the direction where children clearly benefit.

The concern that the edtech sector is still too young to regulate emerged from the conversation with the EU Director General for Innovation, Digital Education and International Cooperation. The argument was that a young market should not be held back by regulatory regimes. Yet, the entire opposite is witnessed with the unregulated digital platform market. Due to lack of regulation, powerful digital platforms like Google, Amazon and Facebook have won gatekeeper status, stifling competition (Aulner and Chee, 2021), swallowing small businesses or killing them altogether (Alcanara et al., 2021).

Regulated markets, albeit relatively young, such as the online gaming industry, have developed for less than ten years (especially among small nation states) precisely because of putting regulatory measures and open standards in place. For example, once the laws and directives came into force in Malta (Lotteries and Gaming Authority, 2018), the gaming sector has since contributed 12% to the national economy (Anastasi, 2018). Online gaming operators require licenses, following rigorous audits, duty of care towards players, live monitoring of

transactions, advanced auditing and reporting systems that adhere to the regulatory
conditions.

It is erroneous to believe that the edtech market is young. It is not. Developing education
technologies have existed since pre-digital time (Watters, 2021). Having been around for 20
years, Metaverse (née Facebook) is not an embryonic company. Yet, no laws or regulations
stopped it from manipulating (Kramer et al., 2014) or harming young people (Milmo, 2021).

3.8. If problems are generated due to technologies, technologies should partially be able to solve them, too

The problems emanating from the technological transformation of education demand, in part,
technological solutions, where independent mechanisms of oversight and governance can
play catch-up with the fast-evolving digital sector. We see time and again that laws take long
to implement (Fenwick, et al., 2017; Brownsword and Somsen, 2021). Regulation and
enforcement have remained sluggish and unable to grapple with powerful shape-shifting
technology companies (Thornhill, 2021).

Not only have regulators been ineffective in responding to societal disasters caused by digital
technologies (e.g., see Flunke and Flamini [in Bennett and Livingston, 2021] about the few
governments who take action against online disinformation), they have also been unable to
anticipate them. This emphasises the need to re-think designs for independent mechanisms
of oversight that should be dynamic and flexible; can bring key stakeholders together and
enable collaborations in setting up rules, terms and standards of ethical practices – efforts that
prioritise learners. Technologically enabled, independent, dynamic and collaborative
mechanisms of governance and oversight would aim to ensure that edtech vendors adhere to
specifically outlined terms and conditions, contextual rules and continuously evolving
standards.

3.9. Edtech products should be licensed to operate in educational institutions

Such mechanisms of oversight and governance that reflect local laws, regulations, cultures
and educational structures would be able to engage with edtech vendors to provide evaluation
and licensing before they are allowed to operate in educational settings. The evaluative and
licensing process would be an ongoing one – that goes in line with any technological and
socio-structural developments. For example, once new standards are adopted in the digital

sector, such independent mechanisms of oversight will be able to evaluate and ascertain whether edtech vendors adhere to them in a timely and relevant manner.

The recently adopted 2089-2021 standard, established by the Institute for Electrical and Electronics Engineers (IEEE, 2021) outlines age-appropriate designs for digital technology companies whose users are children. Having a standard like this is a step in the right direction of providing safe technologies for underage users. However, independent expert entities must exist to bring in the supervision and oversight that will ensure that companies adhere to these standards.

4.   CONCLUSION

Advancing edtech products promising improvements in education have the capacity to change the socio-structural order of education as they increasingly influence decision-making at administrative, pedagogical, etymological, procedural, ethical, societal and personal levels (Hillman, 2022a). Many of these products claim authoritative position in the educational processes while little is known about how they work, whom they benefit and whether they work successfully. They also cross-pollinate (Anagnostopoulos et al., 2013) with other digital systems, policies and actors outside of the education sector and therefore increase the risk of student privacy loss and pose long-term unknown risks for individuals.

While education is considered a human right, businesses selling products to educational institutions is a privilege. To earn it, edtech businesses must adhere to minimal standards and benchmarking. The global market of edtech products is forecasted to reach $370 billion by 2026 (Statista, 2022). In the UK, the edtech market is estimated at £3.4 billion (Ash-Brown, 2021). As such, the edtech industry makes a substantial contribution to economies globally but so would be their societal impact. Edtech are primarily commercial enterprises and by their very nature their priority is first and foremost making business sense. These priorities do not necessarily coincide with what is best for children and learners in general. The education sector can be seen as a marketplace of trying various innovative ideas (edtech products). However, such endeavours demand meaningful oversight of the rules they adhere to and the standards they maintain.

The preliminary findings from this work suggest that an ad hoc basis of product procurement is not enough to say that the education sector will improve and thrive thanks to more technologies. A common, accountable and transparent agreement must be developed across

the sector and to all stakeholders' knowledge for minimum standard and benchmarking to begin to form.

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[i] After contacting the Flemish Ministry for Education, it was confirmed that the platform was never rolled out to the schools contrary to the media reports (Delgado, 2019).

[ii] And yet, these questions address one side of the problem, which is *the technique* of how education is delivered and who decides upon what this technique should be. A second concern that escapes the public debate is *the motivation* of edtech companies – what their interest in education is as business entities. While both technique and motivation merit individual attention, this paper focuses mainly on discussing the first: what edtech products mediate education, who evaluates them and according to what benchmarks?