



Department
for Education

The education technology market in England

Research report

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**Authors: Jane Aston, Elizabeth Davies,
Maria Guijon, Katharine Lauderdale,
Danail Popov**



Government
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Executive summary

The supply of EdTech products and services

To estimate the size and scope of the current education technology (EdTech) market in England, we performed a web crawl exercise in collaboration with Glass.ai. This innovative approach to market sizing involved identifying a set of keywords which describe various aspects of EdTech products and services, using these keywords to guide a web crawl algorithm to identify EdTech company websites, and then extracting information about the companies from their websites. This provided data on the number of EdTech firms in England, their areas of speciality, the age of the company, the geographic location, the number of employees and their revenue.

The new EdTech data from this exercise complements existing information on the EdTech market. We also checked our results against other available figures and note throughout the report where our estimates are subject to some uncertainty.

The EdTech market is a small component of the digital and education sectors

We identified more than 1,000 companies active in the EdTech market in England. Some of these companies operate exclusively in this market while others are also active in other markets. The latter group includes several very large companies – with more than 250 employees – in the technology or industrial sectors which provide all-in-one platforms (ie Google, Cisco or Oracle) or hardware (ie ViewSonic, Atos or IBM).

We estimate that there are between 32,000 and 49,000 employees supplying EdTech products and services in England, with our best estimate being around 41,000. Around 65% of employees in the sector are employed by large companies. We also estimate that EdTech businesses generated £3.7 billion to £4.0 billion in gross value added (GVA) in 2021. This is in line with other sources, particularly the Department for Education's (DfE's) EdTech strategy.

Overall, these figures suggest that the EdTech market in England is a small component of the digital and education sectors, which contributed almost £150 billion¹ and £100 billion² in GVA to the UK economy in 2019 (the most recent year of available information), respectively.

¹ [DCMS sectors economic estimates](#)

² ONS (2021) [Regional gross value added \(balanced\) by industry: all ITL regions](#)

There is substantial crossover activity between market segments

We classified EdTech companies into the following market segments:³

- class aid or educator support: digital tools and resources for teachers to create a more engaging learning experience at school, continue their professional development, plan lessons and track student activities in the classroom (eg virtual learning environments (VLE) and continuing professional development (CPD))
- digital learning product or content: any content or application that supports pedagogical objectives (eg course, video, games, apps, multimedia and textbooks) both for pupils and teachers
- hardware and devices: technologies to facilitate and enhance learning (eg interactive displays or whiteboards, virtual reality/augmented reality (VR/AR) and robotics)
- resources for parents or pupils: digital tools and resources for (1) pupils to enhance their learning experience either at home or at school, and (2) for parents to engage in their journey (eg learning platforms and online tutoring)
- school management: technologies and tools to support school staff in their day-to-day administrative and pastoral activities (eg information management systems, pupil progress tracking, curriculum planning and plagiarism detection)
- SEND (special educational needs and disability) resources: digital tools and resources to “support pupils across their cognition and learning, communication and interaction, sensory and physical, social, emotional and mental health needs covering the entire spectrum of special educational needs and disabilities”⁴
- services: information and communication technology (ICT) solutions for schools, covering security and safeguarding, communication and information technology (IT) support services, and specialised consultancy services for the design, implementation and evaluation of EdTech strategies

An estimated 44% of companies are active in more than one segment and 13% in more than two. We found that large companies are more likely to operate in more than one segment than micro and small companies. Most of the overlap is between companies which provide (1) resources for parents and pupils, and (2) digital products and educational content. A significant overlap is also found between suppliers of

³ Rather than aiming to provide a universally agreed description of the EdTech market segments, this classification aims to develop a framework for classifying the most common keywords used by suppliers.

⁴ [EdTech Impact](#)

(1) resources for parents and pupils, (2) school management, and (3) solutions for class aid and educator support.

Our interview work suggests that some schools prefer to use products in class that pupils can use at home or that are easily transferable if remote learning is necessary. It is difficult to distinguish between resources for parents and pupils (for use outside of the classroom) and other segments (for use in the classroom), as these products and services can be used in different settings.

A large offering for independent learning and revision

Around 40% of EdTech companies provide resources for parents and pupils and employ almost 25% of the EdTech workforce. The rest of the EdTech market is divided mainly between suppliers offering digital learning products or educational content, school management solutions, and class aid and teacher support. Providers of SEND resources are difficult to identify as they may not use this term to describe their offering.

The most frequent descriptors of EdTech products and services

The most frequent keywords in companies' own descriptions of their offerings were: 'e-learning',⁵ 'learning apps', 'online tutoring' and 'learning platforms'. These all describe resources for pupils which could also be used by teachers during class. Companies that matched these terms account for more than half the activity in the EdTech market.

Large companies are over-represented in the EdTech market

Based on our data, we found that 93% of EdTech suppliers are classified as small and medium-sized enterprises (SMEs) and 7% are large companies (compared to less than 1% in the UK as a whole). We found a higher proportion of large companies among (1) suppliers of class aid and educator support, and (2) hardware and devices. In contrast, SEND resources is the market segment with the largest proportion of SMEs.

Several geographical clusters identified

The data suggested clear clusters around London within a broader cluster in the South East, accounting for 39% and 18% of companies, respectively. Leeds, Sheffield, Bristol, Birmingham and Cambridge are the cities outside London with the highest numbers of EdTech companies.

⁵ E-learning includes online education, online learning, digital education, virtual learning, virtual education, distance learning. Other applications include digital literacy, mobile learning, adaptive learning, etc.

EdTech firms are relatively young

The number of newly established EdTech firms has increased considerably in the last 10 years, with a big jump in market entry in 2020 around the start of the Covid-19 pandemic. The market segment with the highest number of firms founded in 2020 was 'resources for parents and pupils'.

Understanding the demand side of the EdTech market

We conducted a total of 33 in-depth qualitative interviews with representatives from 30 schools in England. The objective of the interviews was to better understand how the selection, use and implementation of EdTech products and services at schools works in practice. Overall, our sample strikes a good balance across schools in terms of phases (primary, secondary and special schools) and types (academy or local authority maintained) covered, although none of the respondents were from free schools.

Use of EdTech

Consistent with previous research, the qualitative interviews found that schools were mixed in the extent to which they had embraced and embedded EdTech over the years. As a result of changes between face-to-face and remote teaching at different points in the last 2 years, more schools had been propelled to increase and further embed EdTech and to refine existing processes. A small number of schools interviewed continued to be cautious about using EdTech, particularly for use in the classroom. Differences in EdTech use were driven by senior leaders' views and understanding of the potential benefits of EdTech for staff, learners and parents.

Objectives for EdTech products and services

Use of EdTech in schools typically focuses on having either a whole-school level impact or a curriculum level impact for staff, learners and parents.

Whole-school impact

Most schools interviewed used EdTech products and services to provide benefits for different groups on a whole-school basis, regardless of curriculum area or year. We identified 3 main applications in this category:

- 1. School management and administration:** schools interviewed used specific tools and platforms which allowed them to undertake the day-to-day management and administration of the school more effectively. These included:
 - tools for pupil data management to help with more effective monitoring and to support learner progress

- tools for engaging with staff for day-to-day communication, sharing school policy, providing training and sharing resources for curriculum planning and delivery
 - tools for engaging with parents to share communications and resources, and for providing updates about pupil progress.
- 2. Support for teaching and learning:** most schools interviewed had chosen to support teaching and learning across the school (both in class and remotely) using VLEs, devices or website subscriptions. They had also invested significantly in EdTech devices, including interactive whiteboards, laptops or tablets for learners and staff, and visualisers in a few cases.

Some schools used EdTech for assessment tasks to help reduce teacher workload through automation of marking, moderation and inputting. These included systems designed specifically for assessment purposes, while others used more informal approaches such as embedding quizzes and tests using existing VLEs or specific services.

Several schools used EdTech to support SEND learners or those with language barriers. This included the use of tools designed to assess learner needs and adaptive technologies to improve wider curriculum engagement.

- 3. Pastoral support:** EdTech was used to support safeguarding and related liaison with external agencies. Schools valued technologies that allowed them to better understand and monitor pupils' wellbeing.

A few schools also mentioned using EdTech to promote the importance of mental health and wellbeing and sharing online resources with parents, learners and staff.

Schools also used videoconferencing to support meetings with external stakeholders such as safeguarding professionals and careers guidance professionals. Views on the benefits of this were mixed as some believed a face-to-face approach was preferable.

Curriculum specific objectives

Schools also used specific programmes and online resources to enhance teaching and learning in different curriculum areas. A wide range of products were used and were particularly valued when they (1) benefitted learner engagement and progress, (2) supported in-person and remote teaching, and learning activities, (3) could be tailored to learner needs, (4) allowed teachers to use metadata to provide further support, and (5) provided options to share work with parents. As well as benefitting learners, these features also helped to reduce teacher workload.

Future priorities and gaps in the market

Most of the schools interviewed had an established EdTech approach or had accelerated the process of embedding this over the last 2 years. Future priorities included:

- consolidating and evaluating existing practice before making further changes
- increasing the number of devices available for their learners
- exploring alternative options for pupil data management (where budget and staff time for implementation allow).

School representatives and experts also identified some areas where products could be further improved. These included:

- improving existing or developing new administrative and monitoring systems to ensure EdTech solutions allow multiple functions and interoperability, while improving usability and access for school staff
- improving assessment tools to minimise inputting time required and to provide more options for qualitative analysis
- continuing to develop teaching and learning resources which enhance and add value to existing approaches (eg through using VR/AR) and ensuring products can be used flexibly in classroom, in remote learning or for homework
- finding more innovative ways to integrate EdTech to support SEND learners
- identifying how better safeguarding, data protection and cyber security can be built into school EdTech and promoted by the DfE

Choosing EdTech

Structures for choosing EdTech

Most schools interviewed used a combination of top-down and bottom-up approaches for making EdTech decisions. The processes used depended on various factors, including:

- the extent to which a school had oversight from its multi-academy trust (MAT) or local authority
- whether there was a clear senior leadership team (SLT) process and tools to purchase EdTech products and services of different values
- whether the solution being considered was whole-school or curriculum specific

Top-down approaches were typically used for purchases with significant cost and resource implications that aimed to have a whole-school impact. Various senior leaders, including heads, executive heads and strategic EdTech leads (if not the head it could be

a deputy or the school business manager), could be involved. Middle leaders and wider staff could be asked to input by testing different products.

Bottom-up approaches were typically used for lower value purchases that had curriculum specific objectives. In most cases this was led by curriculum leads and individual teachers who wanted to use specific EdTech solutions in their teaching.

Collecting and assessing evidence on EdTech products

Word of mouth and web searches were the most common ways of finding EdTech evidence. Schools' use of existing research evidence was limited.

Word of mouth: most favoured speaking to another school or individual teacher (both in their own networks or a case study representative) over other forms of information. They felt that schools and teachers would be trustworthy and their views were based on real-life experience.

Online searches: most teachers used online search engines and provider websites. Search result positioning could be influential as school staff have limited search time.

Use of existing research evidence: although various sources of online evidence were available, these were not frequently used by the schools interviewed as they did not often have time to read detailed research reports. A few noted that they found the Education Endowment Foundation (EEF) website helpful. Some schools used internal evidence, through trials and staff and learner feedback.

Key criteria used in EdTech selection

The significant time and resource investment both from schools (when making decisions) and EdTech companies (when marketing products) means it is crucial to understand the key criteria used when choosing between products. Key criteria for schools included:

- cost and ensuring the product met the schools budget requirements
- quality of product, including having a positive impact on learner engagement and outcomes, reducing teacher workload, compatibility with existing products and enhancing existing approaches

Effective practice

The research identified a range of factors that can be considered as effective practice for making decisions about EdTech. These included:

- speaking with other schools
- undertaking trials and product comparisons

- undertaking rationalisation activities of EdTech software and subscriptions to avoid duplication and low use

Future support for choosing products

Many schools felt they could be better informed of the EdTech products and services available and their benefits. Others thought they could further refine and improve their decision-making processes. Areas where schools would benefit from further support when choosing EdTech products included:

- having a trusted online service or website to compare options
- improving access to evaluations and implementation examples
- identifying ways to streamline decision making and create best practice examples for budget requests and proposals in schools
- improving communications about potentially beneficial future products

Implementing EdTech

The qualitative interviews with schools revealed that forthcoming EdTech changes were communicated to staff in school wide or department level meetings, on in-service training (INSET) days or by email. When changes were substantial or school wide, some schools provided dedicated time for staff training.

Typically, schools believed that effective practice in implementation comprised effective and ongoing communication and training for staff which highlighted the benefits of using the technology and how it can be applied in practice.

A key implementation challenge was ensuring that all staff were confident to use new EdTech effectively. The difficulty of finding sufficient time for EdTech training was raised by some interviewees, as there were many other competing priorities for schools. Other challenges were a lack of suitable devices and inequalities of access.

We identified the following future support requirements for the implementation of EdTech:

- more training from EdTech providers would be welcomed
- schools would appreciate a chance to learn from other schools which are further along in their EdTech journeys
- some teachers and middle leaders wanted their SLT to give greater strategic prioritisation to EdTech in their school
- many school staff interviewed wanted DfE to provide more strategic direction for schools regarding their use of EdTech

Introduction

The Department for Education (DfE) commissioned Frontier Economics to provide a clear and comprehensive view of the education technology (EdTech) market in England. The EdTech market includes the provision of digital and digitally enabled products and services to support the day-to-day management of primary and secondary schools, teaching planning, parent engagement and the learning experience of pupils. This covers hardware, software, digital resources and support services (eg IT, payroll and logistics).

Given the increased levels of interest in EdTech among school leaders and the rapid innovation in the sector, DfE is keen to support 'a vibrant EdTech business sector in the UK to provide proven, high-quality products that meet the needs of educators and foster a pipeline of fresh ideas' (Department for Education, 2019). This study aims to support DfE in making informed policy choices regarding the development of the market.

The market has increased rapidly during the last 10 years – particularly during the Covid-19 pandemic – and this trend is expected to continue in the future. Given the rapid development of the market, our study required to analyse both the supply of products and services and their demand and usage by primary and secondary schools. This included:

- developing an operational definition of the EdTech market and defining a taxonomy of products and services
- identifying suppliers of EdTech products and services operating in England and allocating them into market segments
- analysing the size and composition of the supply side of the market
- understanding the selection, use and implementation of EdTech products and services at schools

Our approach comprised the 4 phases of work described below.

Phase 1 – Inception

- Scope interviews with experts
- Literature review

Phase 2 – Data collection using web-crawling

- Define operational definition
- Develop taxonomy of products and services
- Define keywords
- Data collection with Glass.ai
- Test and validate data

Phase 3 – In-depth interviews with schools

- Define sample of schools
- Recruitment for interviews
- Conduct 40 online interviews with 12 schools (headteachers, digital school leaders, teachers etc.)

Phase 4 – Analysis

- Generate statistics on EdTech market in England (size and composition)
- Analyse information provided by schools on:
 1. The choice of EdTech products
 2. EdTech implementation at schools

In the first phase we conducted scoping interviews with experts in the EdTech ecosystem and a literature review of existing evidence to inform both our web-crawling exercise and interview topic guide.

In phase 2 we applied an innovative approach to data collection in collaboration with Glass.ai to identify companies active in the EdTech market. Glass.ai provides an artificial intelligence (AI) algorithm that reads millions of web pages using proprietary language. We gathered information on employment, industries, size, products and services provided, activity across market segments, location and market entry.

Phase 3 involved the collection of qualitative information from in-depth interviews with primary and secondary schools. The aim of this phase was to gather the demand side view on the use and choice of EdTech products and their implementation.

Finally, phase 4 involved the joint analysis of the quantitative and qualitative information.

The rest of the report is structured as follows:

- section 2 describes our data collection methods
- section 3 shows our findings on the EdTech market supply
- section 4 analyses the choice of EdTech products by schools and discusses their implementation

Data collection and methods

Market sizing data collection and analysis

Our approach to data collection consisted of the 4 steps. The work was a collaboration with Glass.ai, which provides an AI algorithm that reads the web using proprietary language. This technology parses natural language and reads millions of web pages including organisations' websites, news reports, social media, event notices, and academic and official sources.

This approach allowed us to identify a large number of companies efficiently with limited manual input. This is particularly relevant where existing databases – such as the Office for National Statistics (ONS) Business Structure Database – are not sufficiently detailed to identify specialised and novel sectors such as the EdTech market. This is because most commercial data sets in the UK rely on the Standard Industrial Classification (SIC) code to classify companies' activities and there is no specific SIC code dedicated to EdTech.

Our approach has 2 main limitations. First, the primary objective of this exercise was to identify relevant companies into the EdTech market rather than investigate in depth which products and services they offer. This is because our approach relies on online text and companies may not provide a detailed description of what they offer, this may not be clear, or it could be hidden or not easy to find. Second, the approach relies on web sources, primarily companies' websites, LinkedIn and Companies House. Therefore, companies without an online presence may be excluded even if they are active in the market.

Step 1 – Operational definition

- Taxonomy of products and services in the EdTech market
- Market segments
- Applications
- Products and services
- Outcomes

Step 2 – Defining keywords

- Define keywords based on our taxonomy complemented by general market terms (i.e. 'edtech', 'edu-tech') and technologies (i.e. artificial intelligence, machine learning, robotics)

Step 3 – Search strategy

- Identify relevant companies in the market based on the language they used to describe themselves and their offering
- ‘Deep crawls’ on selected large companies (e.g. AWS, Cisco, Microsoft, Oracle)

Step 4 - Quality assurance

- Define detailed rules of exclusion to minimise false positive rate
- Cross-check search terms against taxonomy categories and market segments

Tailoring our approach to the EdTech market

The first step was to develop an operational definition of the EdTech market to determine which companies should be included in our analysis. This operational definition is based on various taxonomies of products and services found in external sources,⁶ our literature review and expert interviews. It also covers terms and expressions that known EdTech suppliers use to describe their operations.

We present our taxonomy below. The EdTech market, as defined in this report, includes the provision of digital and digitally enabled products and services to primary and secondary schools, staff, pupils and their parents. It consists of a list of market segments in which EdTech solutions can be applied, a list of applications describing the practical use of these solutions, a list of products and services, and an indicative list of broad outcomes that can be achieved or avoided by schools, pupils or parents.

Rather than providing a universally agreed and exhaustive description of the EdTech market, this taxonomy aims to develop a framework to classify the most common keywords used by suppliers. This taxonomy was developed with input from the DfE to ensure it is fit for purpose to inform policy and further research.

Market segments

- Class aid or educator support
- Digital learning product or content
- Hardware and devices
- Resources for parents or pupils
- School management
- SEND resources
- Services

⁶ [EdTech Impact](#), [BESA LendEd platform](#), [BETT awards](#), among others.

Applications

Practical use link to customer requirements

- Classroom management
- Curriculum planning
- Remote learning
- Personalised revision
- Online tutoring

Products and services

Hardware, software, services and resources

- Learning platforms/apps/games
- Virtual classroom
- Open educational resources
- Teaching or learning software
- Safeguarding training
- Information management system

Outcomes

Benefits for customers

- Parental engagement
- Teaching workload
- Student performance

The next step was to define a list of keywords to map companies in the EdTech market and categorise them into the following 6 groups based on our proposed taxonomy: market segments, applications, products and services, outcomes, general market and technologies. These last 2 groups are too general for allocating companies to market segments. However, they are relevant for identifying companies which are active in the market but which might not provide a detailed description of their offering. We identified more than 200 keywords, which are presented in Technical annex 1.

The search strategy then relied on Glass.ai’s algorithm to match our keywords with the text that companies⁷ in England use to describe what they do and what they offer both on their websites and in other sources (see Figure 1). After identifying this first group of companies, the algorithm searched for similar companies that use the same language and operate in similar sectors.

Figure 1: Sources used by Glass.ai



Source: Frontier Economics

To ensure fuller coverage of the market, we used ‘deep crawls’ or in-depth searches of a list of selected large companies identified from existing sources (Dun & Bradstreet and Crunchbase) and expert interviews. This is because most large companies which are active in the EdTech market are also active in other sectors or industries, and they may have dedicated websites specific to each offering.

Quality assurance

After obtaining an initial data set of companies identified through the algorithm, we followed an iterative quality assurance process. We first reviewed a sample of 100 companies to identify false positives – companies which were identified through search

⁷ The attribution of companies to the UK was based on the company website URLs and where they were being managed.

terms but which were not active in the market – and then set out rules of exclusion for the following types of companies:

- suppliers to nurseries
- suppliers to higher and further education institutions
- suppliers to wider society or citizens
- suppliers of e-learning services to companies (without a focus on primary or secondary education)
- suppliers to e-training services for professional development (excluding CPD for teachers and academic staff)

We generated a new data set based on this feedback. We manually reviewed a sample of another 100 companies in the new data set to assess the accuracy of the search terms and identify false positives. Overall, we found a false positive rate of around 5% in the sample reviewed, which is in line with what is expected when applying the Glass.ai approach based on experience of applying this method to other sectors.

Approach to qualitative interviews with schools

A total of 33 in-depth qualitative interviews were conducted with representatives from 30 schools in England. The nature and role of the schools and respondents is shown in the following table. Due to the scale and qualitative nature of the research, interview recruitment did not aim to be directly representative of schools in England. Instead, the objective was to ensure a good balance of schools based on phase and type, as well as other key factors including geography and deprivation (using free school meals (FSMs) as a measure for this).

Overall, the achieved sample provides a good reflection of the different phases and types of schools in England. When we compared our sample with school population data from Get Information About Schools (GIAS),⁸ we found a higher than expected engagement from schools where more than 30% of the learners were eligible for FSMs. It should also be noted that none of the respondents were from free schools.

However, given the small sample and that respondents had a range of responsibilities, the qualitative findings should not be considered as representative of all schools.

⁸ GOV.uk, [Get Information about Schools](#)

Tables showing number of schools/respondents interviewed by category:

Category of respondent interviewed by phase	Number of schools engaged
Primary	16
Secondary	11
Special school	2
All through	1

Category of respondent interviewed by type	Number of schools engaged
Academy	15
Local authority maintained	12
Other	3

Category of respondent interviewed by area	Number of schools engaged
Urban	23
Rural	7

Category of respondent interviewed by % FSM	Number of schools engaged
<30% FSM	11
>30% FSM	18
N/A	1

Category of respondent interviewed by respondent role	Number of schools engaged
Senior leader	12
Middle leader	10
Teacher	11

Source: Frontier Economics

We conducted the interviews using a semi-structured topic guide via video conferencing software. The interviews typically lasted 45 to 60 minutes and were held between 17 February and 15 April 2022.

We sought to engage staff from all levels within schools to fully explore how decisions relating to different EdTech products and services were made and implemented. This included speaking with those who made decisions about EdTech, those involved in the implementation and rollout of EdTech, and those who used EdTech to deliver teaching and learning.

Our preferred initial approach was to recruit at a school level via DfE contacts who had agreed to take part in the research and some use of GIAS contact data. We then aimed to speak with 3 to 4 members of staff with different responsibilities.

Following initial piloting and rollout of this approach, we recognised, based on feedback from schools, that the time investment would not be feasible for many due to resource pressures as a result of Covid-19 related staff absences.⁹ Therefore, in consultation with the DfE, we worked with a specialist external research recruitment agency to identify and engage school staff (including senior leaders, middle leaders and teachers) who had experience in decision making, implementation or use of EdTech products and services in schools.

We undertook our analysis using a thematic framework. The research team reviewed the interviews with the key findings then being organised individually by question area and theme. They then reviewed this to understand commonalities and areas of difference,

⁹ We identified a total of 250 schools via GIAS and contacted them by email and follow-up phone calls, resulting in one full case study being completed with 4 respondents taking part. Although 3 further schools engaged following this communication, they were unable to proceed with their involvement due to Covid-19 related resourcing issues, which was consistent with reasons for refusal given by other schools. Eleven schools were contacted via the DfE's direct contacts and this resulted in one senior leader taking part in an interview on behalf of their school.

and the authors synthesised these into the report. Within the report pen portraits are used to highlight specific experiences and opinions on the themes discussed, and as such in some instances the views of a specific school or respondent may be used in more than one pen portrait.

Approach to supplementary evidence and analysis

To provide context for the evidence described above, we identified and interviewed a set of EdTech sector experts. The experts were selected to provide a range of perspectives and areas of expertise. They included providers, researchers, investors and organisations that support product selection and included individuals affiliated with EdTech Impact, Innovate my School, Sparx Learning, Whizz Education, the Supporting Education Group, Emerge Education, Nesta and Educate Ventures. The interviews were semi-structured and we tailored the topics to the specialism of the experts.

In addition, we conducted a rapid literature review at the beginning of the study to identify relevant existing research on the EdTech market in England. The review covered academic and grey literature. It found that the academic literature on this subject is at a relatively nascent stage – the views of sector experts provided a more comprehensive background for the primary data collection and analyses.

To complement the primary data collection, we have integrated the findings from sector experts and the literature review throughout the report.

The supply of EdTech products

Here, we summarise our findings on EdTech products and services available in the England market under the following topics:

- development of EdTech products for the England market
- size of the EdTech market in England
- composition of the EdTech market in England

Development of EdTech products for the England market

Many EdTech products, particularly in curriculum resources, have been created by teachers or students to address a challenge that they have identified in their own experience. This has led to a relatively large number of UK-based EdTech startups.¹⁰ Moreover, the UK's EdTech sector experienced rapid growth during the COVID-19 pandemic,¹¹ and this was accompanied by rapid recent growth in venture capital investment.¹² In 2021 there were approximately 1,200 EdTech companies in the UK (Clark-Wilson and others, 2021).

Experts noted that there are high returns to scale for EdTech products. Margins for products with small user bases (eg <1000 schools) tend to be low, but if the product is bought by thousands of schools, then the margins can be high. In general, back-end products that aim to increase staff efficiency and save costs tend to have faster growth and larger user bases than curriculum resources.

For UK EdTech startups looking to achieve large scale, it can be important to expand to markets outside the UK at a sufficiently early stage in their evolution. The UK has a strong international reputation for educational products, and this is an advantage to England EdTech companies expanding internationally.

Expanding the user base has benefits in terms of improving the quality of the product. With a larger user base, companies are able to collect more data about product performance, including leveraging data across countries. In addition, with larger scale, companies can carry out more extensive and rigorous forms of evaluation.

¹⁰ [How UK companies are leading the global EdTech revolution, EducationTechnology.co.uk](https://www.educationtechnology.co.uk/news/how-uk-companies-are-leading-the-global-edtech-revolution)

¹¹ <https://www.businessleader.co.uk/uk-EdTech-sector-grew-by-72-in-2020/>

¹² <https://www.statista.com/statistics/1085839/venture-capital-investment-in-european-EdTech-by-region/>

Experts noted that, while many EdTech products are currently available, in general there are shortcomings in the best-in-class solutions in terms of providing all functionality that schools might need.

Evidence-based product development

Experts emphasised that collecting evidence is a key element of product development, including early stage research integration. Products may be used in different ways to those that developers originally intended. Research can help ensure that the product achieves the desired outcomes in practice and demonstrate value to potential users (schools).

There are a variety of potential types of evidence, ranging in scale and complexity. These include small case studies, before/after comparisons, quasi-experimental designs and large randomised control trials (RCTs). Some developers have academic backgrounds, while others have limited experience in education and research. Although there is a broad ambition in the sector to develop evidence-based products, many lack the skills and experience to thoroughly incorporate evidence collection and analysis into their product development. In some cases, academics and developers collaborate, but this requires the programme of work to lead to outputs that are useful to both groups (ie both academic research and a commercial product).

Gathering gold-standard RCT evidence on learning outcomes is costly in terms of resources and time (eg conducting an RCT may require distributing the product free for a year). Investors can be reluctant to delay bringing a product to market to gather this type of evidence. Many England EdTech products are small (<500 schools), and these typically cannot run large RCTs. However, there are alternative forms of useful evidence that are better suited to smaller companies or companies at an earlier stage of evolution. Regardless of the type of evidence collection, working with teachers in product development and on an ongoing basis is critical for understanding the needs of users and improving the quality of products.

Frequent input from practitioners is especially valuable as investors in EdTech startups are not necessarily education specialists. Investors can exert pressure on startups to release products prematurely, without sufficient testing and evidence. This creates risks of bad product performance and failure to scale up. EdTech companies can fail, creating a substantial downside risk to investors (Knee, 2016).

Size of the EdTech market in England

We identified 1,017 companies which are active in supplying products and services in the EdTech market in England.¹³ Some of these companies operate exclusively in the EdTech market while others are also active in other markets. The latter group includes several very large companies – with more than 250 employees – in the technology or industrial sectors which provide all-in-one platforms or hardware.

Information on suppliers' employment is based on data from the companies' accounts (Companies House) and on the number of employees listed on LinkedIn.¹⁴ For large companies which are active both in the EdTech and other markets, alternative data sources (Dun & Bradstreet) allowed us to identify their overall staffing but did not provide information on how much of their activity is specific to the EdTech market. Employment data is available for 68% of the companies in our data set.

Assessing EdTech employment in large firms is quite challenging as they do not break down figures for their workforce by market or technology. Although there are around 50 large companies active in the EdTech market, not all their employees will be working on EdTech related activities.¹⁵

Consequently, we allocated only a proportion of employees in large companies to the EdTech market. We estimate that English suppliers employ between 32,000 and 49,000 people, with our best estimate at around 41,000.¹⁶ The lower end of the range assumes that only 10% of employees in large companies work in EdTech related activities, while the upper end allocates 20% of employees to these activities.

In the following sections of the report, we use the central estimate of 41,000 employees except where specified otherwise.¹⁷ Among these 41,000 individuals, almost 65% are employed in large companies. Although this assumption influences our estimate of the total size of the market, it has very limited impact on our assessment of its characteristics and composition.

¹³ The statistics presented in this section exclude companies that recently ceased trading, according to Companies House, and non-English companies.

¹⁴ Where both sources are available, we use data from Companies House as it is likely to be more accurate than data from LinkedIn. Where LinkedIn is used, the company's total workforce may be underestimated as not all employees may be listed on the service.

¹⁵ Allocating all employees in large companies to the EdTech market would mean grossly overestimating the size of the workforce to be around 1.7 million people.

¹⁶ This figure includes both full-time and part-time employees.

¹⁷ The middle range assumes a 15% adjustment for large companies.

We estimate that EdTech companies generated between £3.7 billion and £4.0 billion of gross value added (GVA)¹⁸ in 2021, with our best estimate at £3.8 billion.¹⁹ This estimate suggests that the EdTech market in England accounts for almost 4% and 3% of the English educational (£101 billion) (ONS, 2021) and digital markets (£148 billion),²⁰ respectively. This is in line with other sources (Clark-Wilson and others, 2021), particularly the DfE's EdTech strategy (Department for Education, 2019). According to the latter, the UK had more than 1,200 EdTech companies in 2019 and the market was expected to reach £3.4 billion by 2021, growing at 22% every year (Department for Education, 2019).

Our data also includes revenue figures for 8% of the companies, which have a combined revenue of £17 billion. However, this is not a reliable estimate of the total turnover of EdTech companies and may under- or over-estimate the true figure. Our estimate is based on a small proportion of our sample (ie an under-estimate) but the revenues of larger companies are not adjusted to reflect the fact that only part of their activity takes place in the EdTech market (ie an over-estimate).

Market size by segments

The taxonomy of EdTech products has become increasingly complex in recent years, and it is continually evolving. There is currently a trend toward multi-purpose platforms that fall into multiple subcategories. Recent acquisitions between EdTech companies have allowed companies to bundle functions together within a product to try to solve more complex problems for schools.

Figure 2 shows the number of companies by market segment. We found that 40% of EdTech companies provide resources for parents and pupils. The rest of the market is divided mainly between suppliers offering digital learning products or educational content (19%), school management solutions (14%), and class aid and teacher support (13%). However, it is worth noting that providers of SEND resources are difficult to identify as they may not use this term to describe their offering.

Many companies are active across market segments and appear in multiple segments. Figure 5 takes account of the fact that there is high activity across market segments. More than 40% of companies are active in more than one segment and 13% in more

¹⁸ GVA measures the contribution to the economy of the amount of goods and services that have been produced minus the cost of all inputs and raw materials used for their production. It is used in the estimation of the gross domestic product (GDP) – $GDP = GVA + taxes + subsidies\ on\ products$.

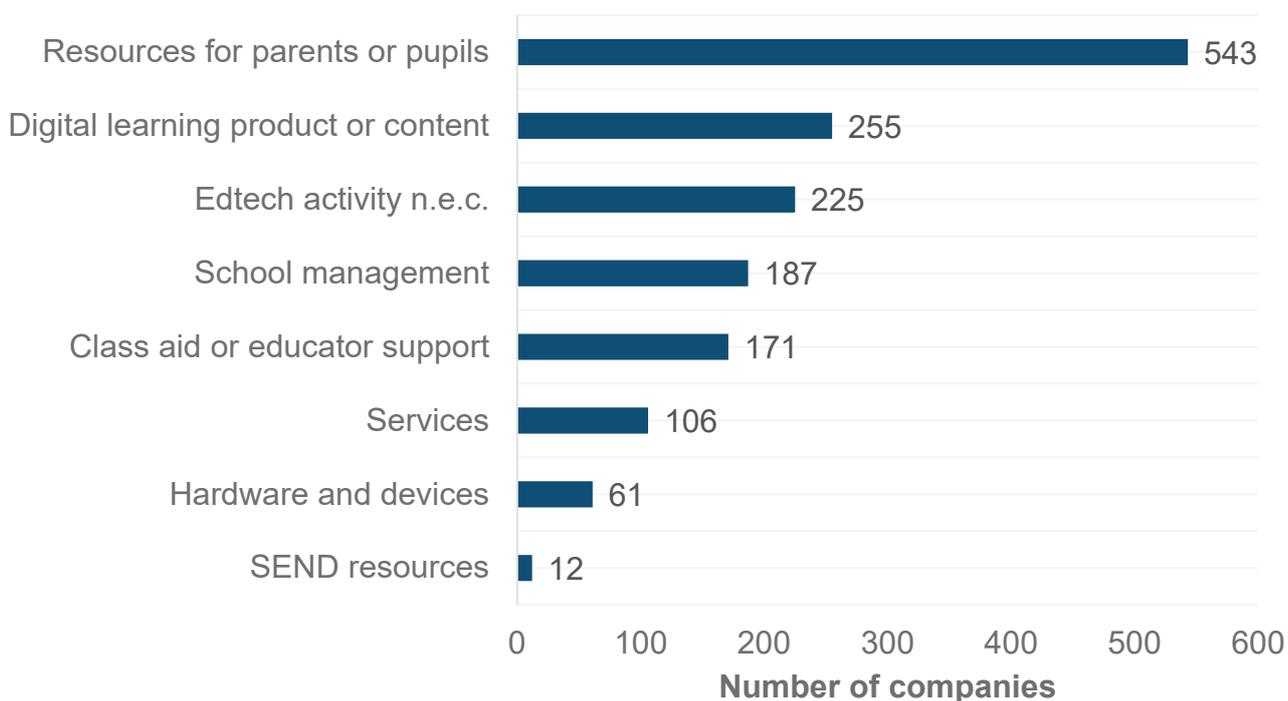
¹⁹ This figure is reached by multiplying our employment best estimate (41,000) by an estimate of the GVA per worker typically generated by digital companies in the industrial sectors relevant to the EdTech market. A detailed description of this calculation is provided in Technical annex 2.

²⁰ [DCMS sectors economic estimates](#)

than two. We found that large companies in our data set are more likely to operate in more than one segment than micro and small companies.²¹

As Figure 3 shows, most of the overlap is between companies providing resources for parents and pupils and digital products and educational content (such as learning apps, online courses and educational games) with more than 100 companies operating in both market segments. This group represents 30% of all companies active across segments.

Figure 2: Number of companies by market segment

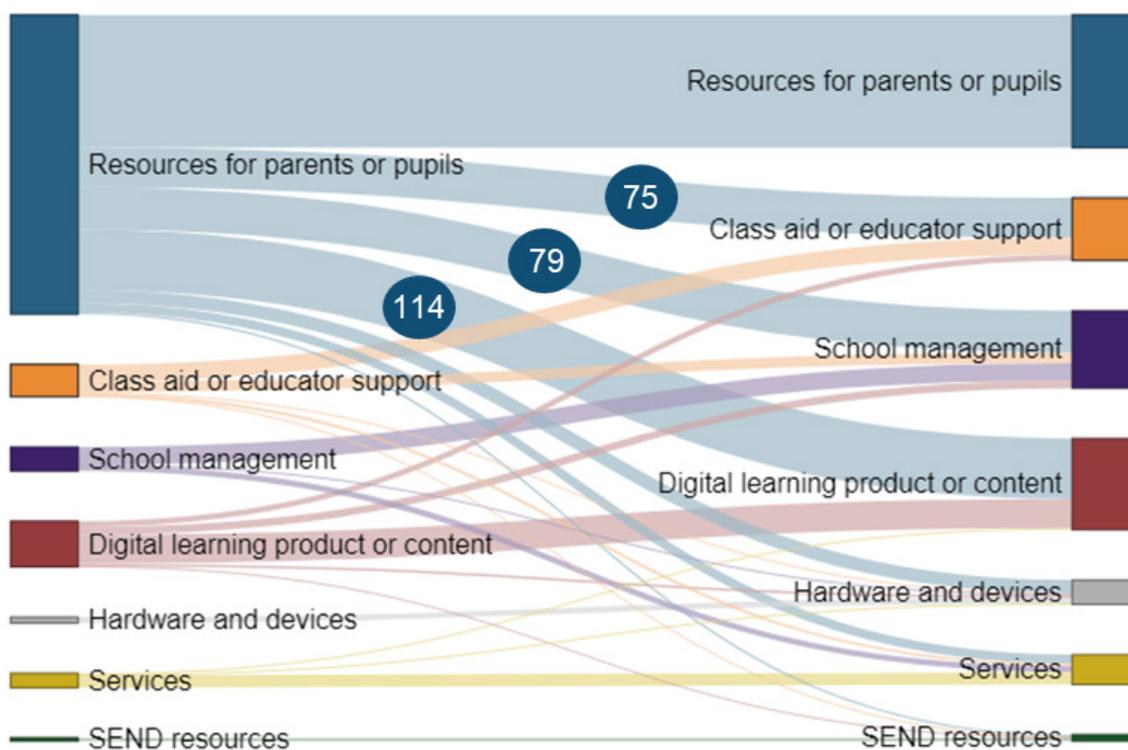


Source: Frontier Economics analysis of Glass.ai data

Note: Number of companies by market segment includes those that are active in more than one segment. Estimates exclude the 8% of companies that we could not assign to any segment. 'EdTech activity n.e.c.' (not elsewhere classified) includes companies that matched broad keywords (eg edtech, edutech and edtech solution), independently if they matched any other keyword.

²¹ Companies are categorised as micro (with 10 or fewer employees), small (with 50 or fewer), medium (with 250 or fewer) or large (with more than 250 employees). This is consistent with standard statistical definitions as used, for example, by the ONS.

Figure 3: Number of companies with operations across segments



Source: Frontier Economics analysis of Glass.ai data

Note: Numbers in circles represent the number of companies active across pairs of market segments.

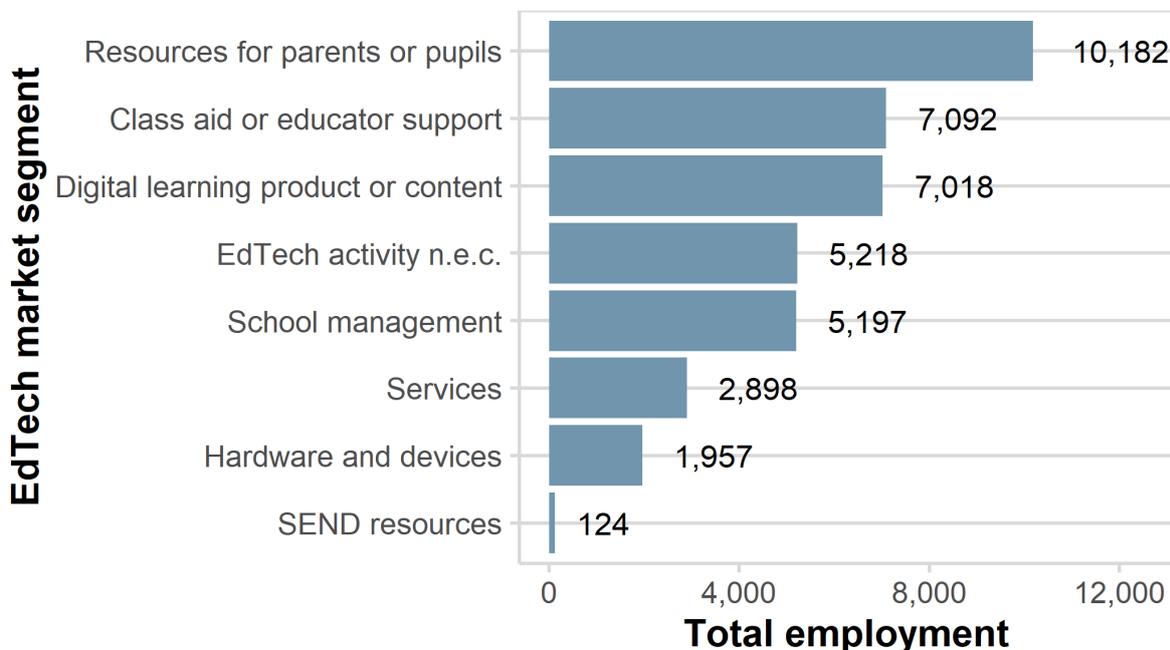
A significant overlap is also found between suppliers of resources for parents and pupils, and (1) school management and (2) solutions for class aid and educator support, with 79 and 75 companies operating across these segments, respectively. The school interviews suggested that some schools prefer to use products in class that pupils can also use at home or that are easily transferable if remote learning is necessary. It is difficult to distinguish between resources for parents and pupils (for use outside of the classroom) and other segments (for use in the classroom), as these products and services can be used in different settings.

Figure 4 provides employment estimates by market segment. Employment totals are split equally between the segments in which companies are active.²² Companies supplying resources for parents and pupils, class aid and educator support solutions, and digital

²² For example, if a company has 100 employees and operates in 2 market segments, half are allocated to one market segment and half to the other.

learning products and content account for almost 60% of EdTech employment. These groups include some large companies both in the digital and educational sectors which provide all-in-one platforms or solutions for education, e-learning and tutoring services, and large publishers.

Figure 4: Estimated employment by market segment



Source: Frontier Economics analysis of Glass.ai data

Note: Employment data is available for 68% of the companies in our data set. Number of employees weighted by number of market segments per company. Estimates exclude the 8% of companies that we could not assign to any segment. ‘EdTech activity n.e.c.’ includes companies that matched broad keywords (eg edtech, edutech, and edtech solution), independently if they matched any other keyword.

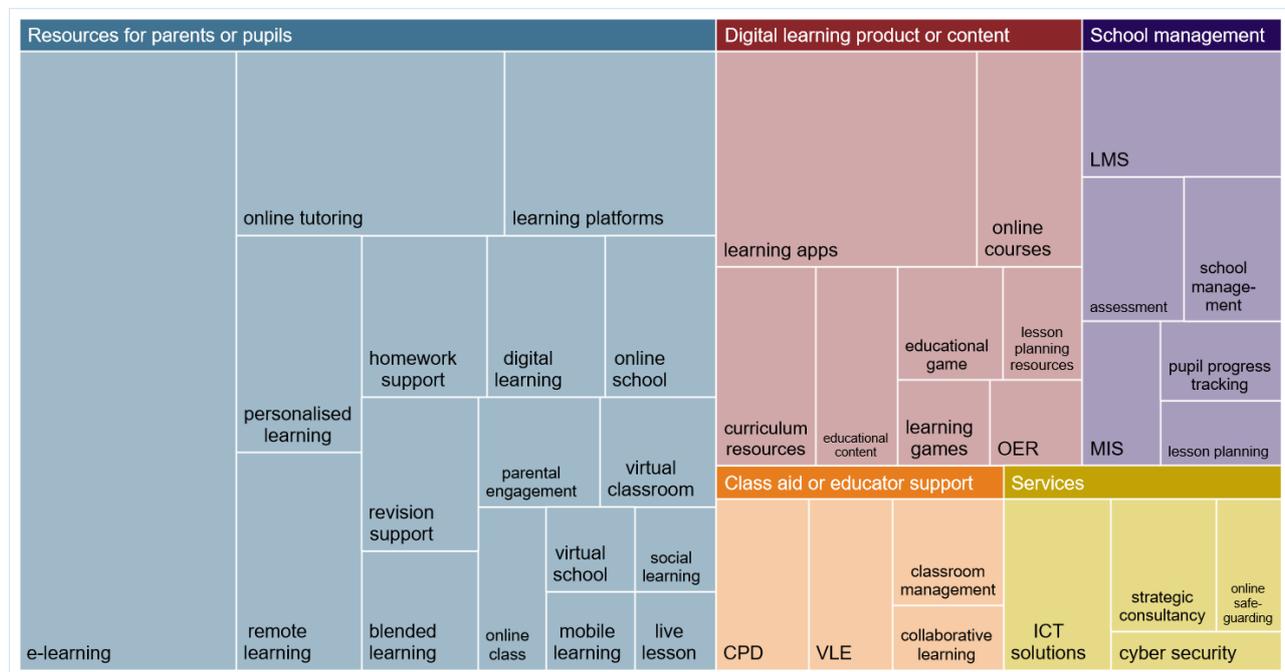
In contrast, firms providing hardware and devices and SEND resources are the smallest segments in terms of employment. As Figure 11 will later show, the first segment is composed mainly by one-stop-shops offering interactive displays and equipment and educational robotics. As mentioned before in this section, the SEND resources segment is under-represented in our data set as companies may not use this term to describe what they offer.

Products and services provided

Figure 5 summarises the keywords matched through our data collection strategy by market segment. The size of each box represents the number of companies which use each keyword when describing their offering. Each company can match multiple

keywords across domains. The biggest matches in our data set were with terms related to ‘e-learning’,²³ ‘learning apps’, ‘online tutoring’ and ‘learning platforms’, all resources for pupils that can also be used by teachers during class. Overall, companies that matched these terms account for more than half the activity in the EdTech market.

Figure 5: Main keywords matched by market segment



Source: Frontier Economics analysis of Glass.ai data

Note: Keywords with less than 10 matches not included. LMS – learning management system, OER – open educational resources, MIS – management information system, CPD – continuing professional development, VLE – virtual learning environments.

However, as mentioned above, these results should be interpreted with caution as the primary objective of our data collection strategy was to identify relevant companies in the market rather than investigating in depth which products and services they offer. As our approach depends on online text, companies may use these terms to contextualise the products and services they offer or to advertise themselves. It should also be noted that 15% of companies in our data set did not match any of the segment-related keywords or only matched our general market and technology terms.

²³ E-learning includes online education, online learning, digital education, virtual learning, virtual education, distance learning. Other applications include digital literacy, mobile learning, adaptive learning, etc.

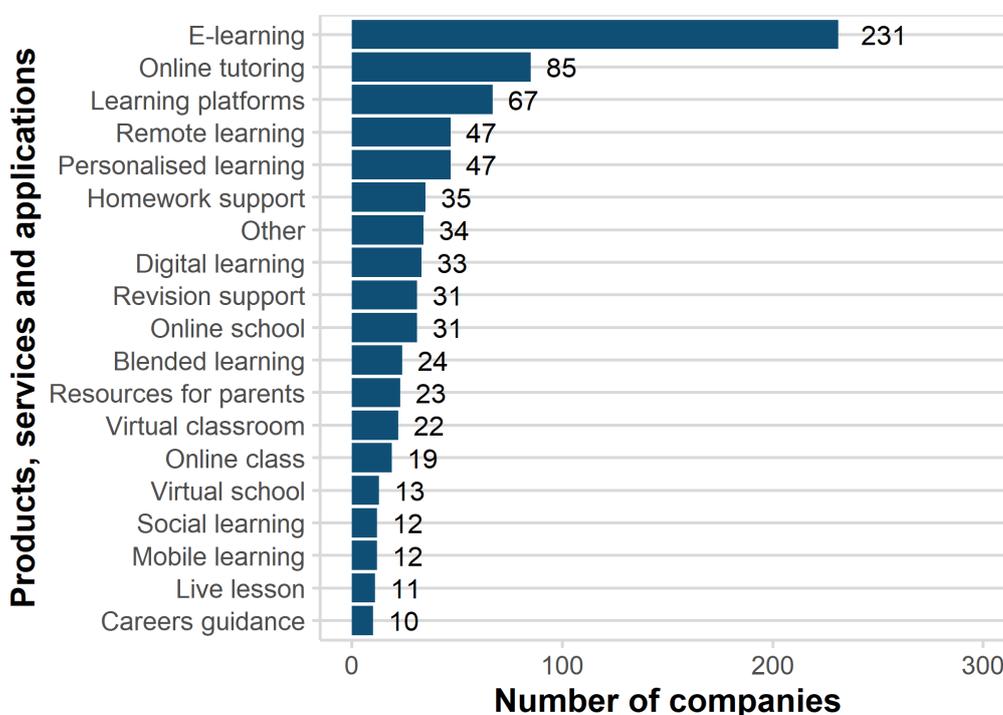
Market segments deep-dive

We examined each of the keywords used to identify EdTech companies in our data set to better understand what applications and products and services might be provided in each market segment. This analysis excludes the 'EdTech activity not elsewhere classified (n.e.c)' segment as this includes companies which matched keywords related to the general market (eg 'EdTech', 'edu-tech' and 'education technology') and technology related terms (eg 'data analytics' and 'cloud storage'). This is because these terms are too broad for allocating companies into market segments.

Resources for parents and pupils

As Figure 6 shows, within the 'resources for parents and pupils' market segment, the most frequently matched terms include 'e-learning' (231 companies), followed by 'online tutoring' (85 companies) and 'learning platforms' (67 companies). This suggests that most companies in this market segment are involved in providing information and digital tools and resources for pupils to enhance their learning experience either at home or at school. In particular, learning platforms tend to be SaaS (software-as-a-service), meaning they are licensed on a subscription basis. Our interviews with schools suggest that pupils without access to devices at home may use these platforms at school or teachers may use them to complement the curriculum.

Figure 6: Number of companies by products, services and applications – resources for parents and pupils



Source: Frontier Economics analysis of Glass.ai

Note: 'Other' includes 'video learning', 'm-learning', 'adaptive learning', etc

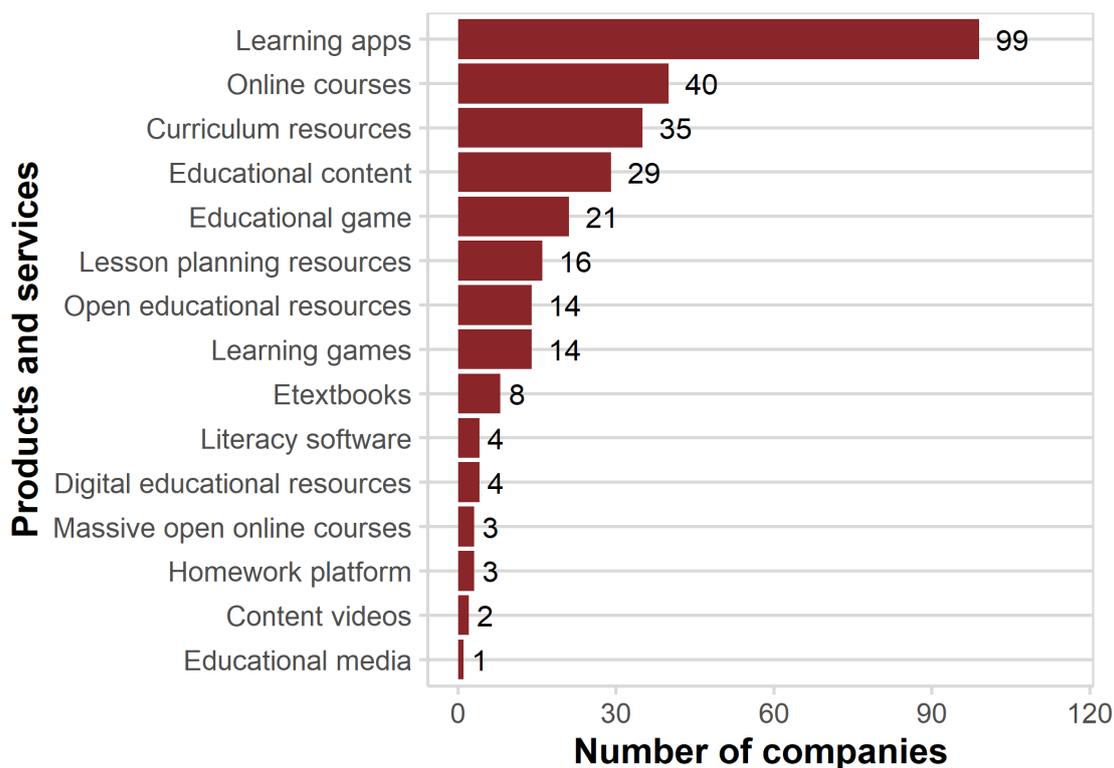
Examples of 'resources for parents and pupils' suppliers:

- **Tutorful:** Offers one-on-one online tuition tailored to every student in a variety of subjects covering primary through GCSE and A-Levels. It also includes an online classroom with an interactive virtual whiteboard to support screen sharing, file swapping and note taking.
- **Learning Ladders:** A suite of tools, all-in-one system designed to support school leaders, teachers, parents and children with every aspect of learning at school and at home. This includes curriculum planning, portfolios, assessments, progress tracking, remote learning and family engagement.
- **Tassomai:** Intelligent online learning program helping students at all levels to improve learning outcomes through bite-sized tasks tailored to each user. Students learn through quizzes and short videos, using mobile apps and other online devices.

Digital learning product or content

The 'digital learning product or content' segment is composed of companies offering any content or application that supports pedagogical objectives (eg course, video, games, apps, multimedia, textbooks, etc) both for pupils and teachers. As Figure 7 shows, the most frequently matched keywords within this market segment are linked to the provision of 'learning apps' (99 companies) followed by 'online courses' (40 companies) and curriculum resources (35 companies).

Figure 7: Number of companies by products, services and applications – digital learning product or content



Source: Frontier Economics analysis of Glass.ai

Examples of ‘digital learning product or content’ suppliers²⁴:

- **HarperCollins (Collins Connect):** Offers digital resources and activities for use in the classroom or at home, both for primary (eg Collins Big Cat, Snap Science, Busy Ant Maths) and secondary education (GCSE and A-Level).
- **2simple:** Offers free and paid digital resources for schools and teachers across all subjects, including all-in-one solutions (Purple Mash and MiniMash), on-the-go observation and assessment solutions (EvidenceMe), wellbeing platform (Vstriver) and an online library of guided reading books (Serial Mash).
- **Teachit:** Provides resources, including teacher packs and curriculum planning tools, on a subscription basis, which are shared and checked by teachers.

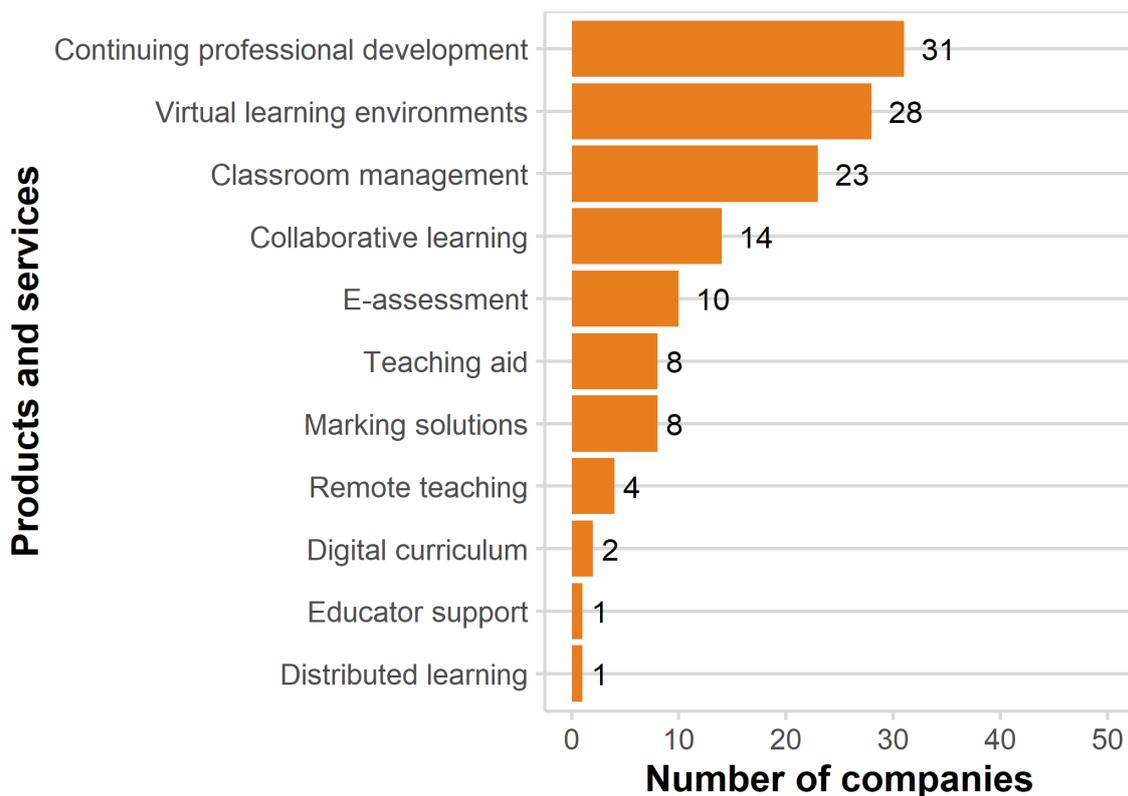
²⁴ We used the following criteria for selecting examples:

- (1) Include examples of companies that matched the most common keywords in each market segment in the products and services category
- (2) Include examples of companies that matched the most common keywords in each market segment in the applications category
- (3) Include a mix of well-established companies and start-ups (based on year of establishment)

Class aid or educator support

The 'class aid or educator support' segment appears to be concentrated across 3 main categories: CPD, VLE and classroom management solutions. As Figure 8 shows, more than half of companies in this segment offer CPD training for teachers and technology solutions to support them with all the digital elements of their classes, including lesson planning, curriculum mapping, pupil tracking, assessment, feedback and communication tools, among others.

Figure 8: Number of companies by products, services and applications – class aid or educator support



Source: Frontier Economics analysis of Glass.ai

Examples of 'class aid and educator support' suppliers²⁵:

- **Hegarty Maths:** Online maths platform offered on a subscription basis to support maths teaching of and learning by pupils in secondary school. It allows teachers to set personalised tasks, track students' answers and provide them with feedback. It includes video lessons and bespoke questions.
- **Ark Curriculum Plus:** Offers a platform for teachers which includes curriculum maps and tools for planning lessons combined with bite-sized professional development videos and tutorials, and assessments tools.
- **BlueSky:** Tailored appraisal, performance management and CPD platforms. It allows schools and teachers to create records of their professional learning in real time linked to school and team priorities, and provides granular reporting to enable leaders to identify emerging talent, track impact and inform future strategy.

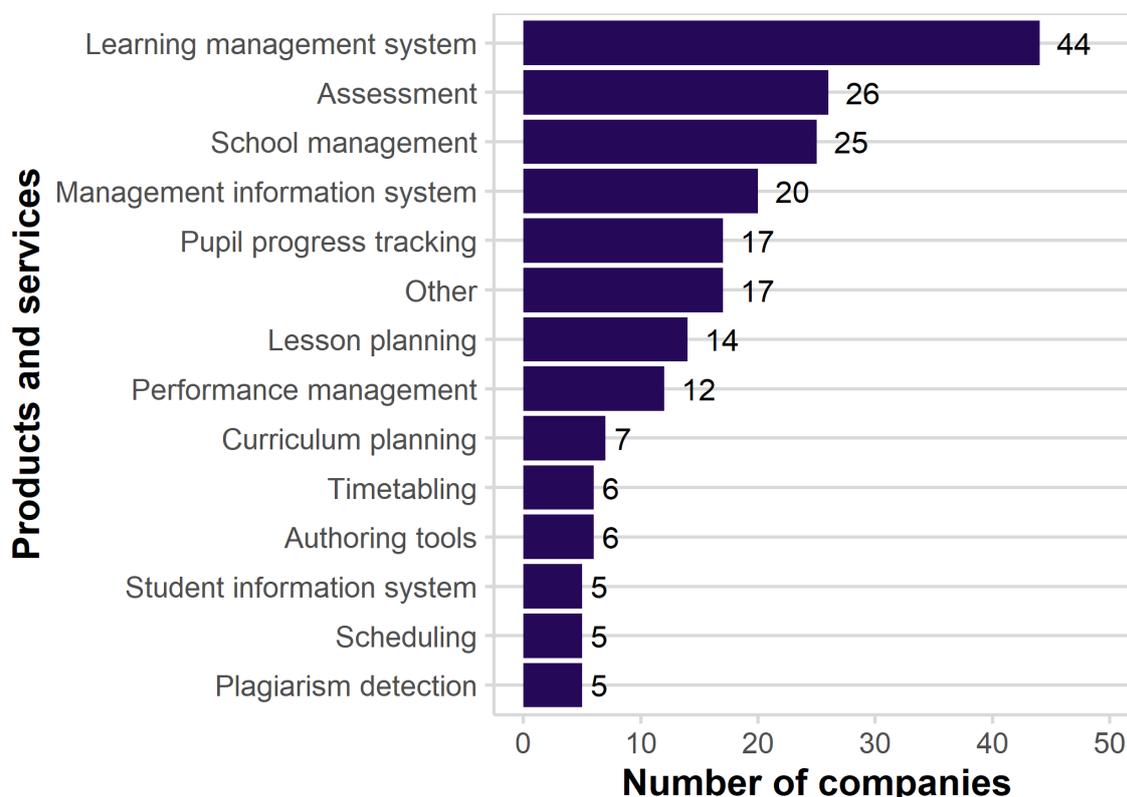
School management

In the 'school management' market segment, the most frequently matched terms are those related to the provision of learning and information management systems (LMS and IMS), and general solutions to support the assessment of students and tracking their progress.

²⁵ We used the following criteria for selecting examples:

- (1) Include examples of companies that matched the most common keywords in each market segment in the products and services category
- (2) Include examples of companies that matched the most common keywords in each market segment in the applications category
- (3) Include a mix of well-established companies and start-ups (based on year of establishment)

Figure 9: Number of companies by products, services and applications – school management



Source: Frontier Economics analysis of Glass.ai

Examples of ‘school management’ suppliers²⁶:

- **Juniper:** Offers a wide variety of tailored software training and professional services (e4education) for primary and secondary schools. Its software includes Sonar Awards to reward, celebrate and share achievements of students; Sisra Analytics, for real time data analysis; Catalyst Payroll, to manage school payments; and *Horizons*, a management information system.
- **IRIS:** Provides customised software solutions and services for MATs, school leaders, school business managers and administrators. This includes business intelligent software, financial planner and reporting, all-in-one parent engagement system (IRIS ParentMail), a cloud-based management information system (IRIS Ed:gen), among others.

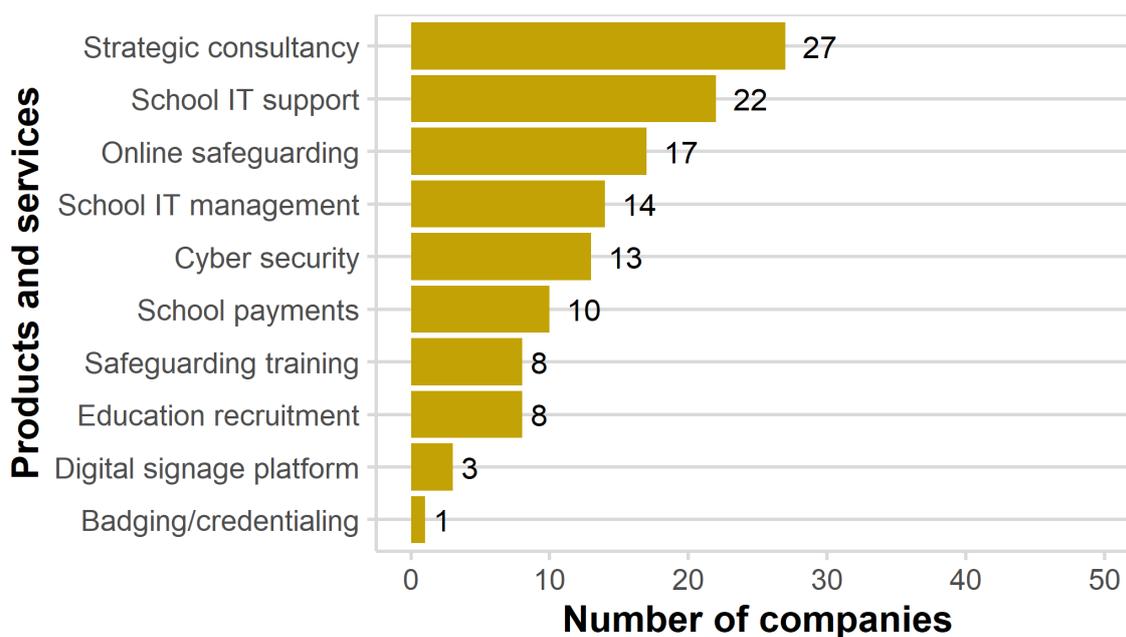
²⁶ We used the following criteria for selecting examples:

- (1) Include examples of companies that matched the most common keywords in each market segment in the products and services category
- (2) Include examples of companies that matched the most common keywords in each market segment in the applications category
- (3) Include a mix of well-established companies and start-ups (based on year of establishment)

Services

Companies identified through our data collection strategy provide a wide range of services, including school IT support and management (36 companies), consultancy services (27 companies), and online safeguarding training, implementation and certification (17 companies). Consultancy companies, in particular, help schools in the design and implementation of their EdTech strategies and bridge the gap between them and potential suppliers.

Figure 10: Number of companies by products, services and applications – services



Source: Frontier Economics analysis of Glass.ai

Examples of 'services' suppliers²⁷:

- **AdePT Technology Group:** Provides designed-for-schools solutions covering security and safeguarding (web-screen, antivirus, firewalls, MailProtect, remote backup, CCTV), communication, IT support services and audio visual equipment in partnership with other EdTech companies such as Promethean, BenQ, ViewSonic and InVentry, etc.

²⁷ We used the following criteria for selecting examples:

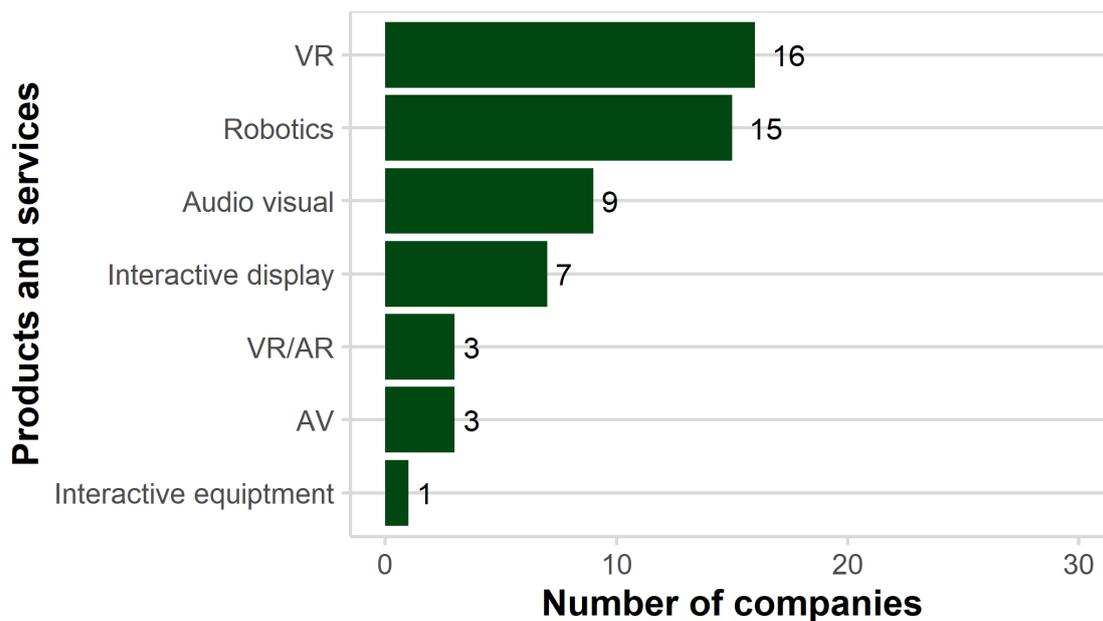
- (1) Include examples of companies that matched the most common keywords in each market segment in the products and services category
- (2) Include examples of companies that matched the most common keywords in each market segment in the applications category
- (3) Include a mix of well-established companies and start-ups (based on year of establishment)

- **Albion (TrilbyTV):** Digital signage platform for schools to upload, approve and share curated content among students and teachers.
- **Tootoot:** Safeguarding app for pupils, including confidential reporting app, paperless incident recording, real time reports for senior leadership, governors and councils, mental health and wellbeing tracking, and monitoring of vulnerable student groups.

Hardware and devices

Most of the companies providing hardware and devices to primary and secondary schools matched keywords related to ‘virtual reality’ (VR) (16 companies) and ‘robotics’ (15 companies). This suggests that, as well as providing interactive displays, whiteboards or equipment, companies in this segment also provide other technologies which can help enhance the learning experience of pupils at school. It should be noted that some of these companies are retail suppliers that sell products from a variety of brands.

Figure 11: Number of companies by products, services and applications – hardware and devices



Source: Frontier Economics analysis of Glass.ai

Note: VR – virtual reality, VR/AR – virtual reality/augmented reality, AV – augmented virtuality.

Examples of 'hardware and devices'²⁸:

- **BenQ UK:** Multinational company that sells and markets technology products, consumer electronics, computing and communications devices. Its EdTech offering includes interactive flat panels and whiteboards, smart projectors and stretch interactive displays.
- **Twin Education:** Offers a series of education kits on a subscription basis – including robotics and autonomous vehicles – and a learning app for children aged 7-12 with interactive STEM (science, technology, engineering and mathematics) videos, coding games, DIY projects and skill reports.
- **VRAR School:** Provider of interactive and immersive educational content using virtual, augmented and mixed reality solutions through bespoke apps, films and real time experiences.

Market size by industry

Figure 12 shows the top 10 industry categories in our data set, based on Glass.ai's bespoke classification system. These 10 categories account for more than 90% of the businesses captured in our data set, with the remaining (88 firms) operating across a wide range of other industries.²⁹ This highlights how difficult it would be to identify EdTech companies based on traditional classifications. In line with the nature of the market, the most common industries include 'E-learning', 'education management' and 'information technology and services'.

²⁸ We used the following criteria for selecting examples:

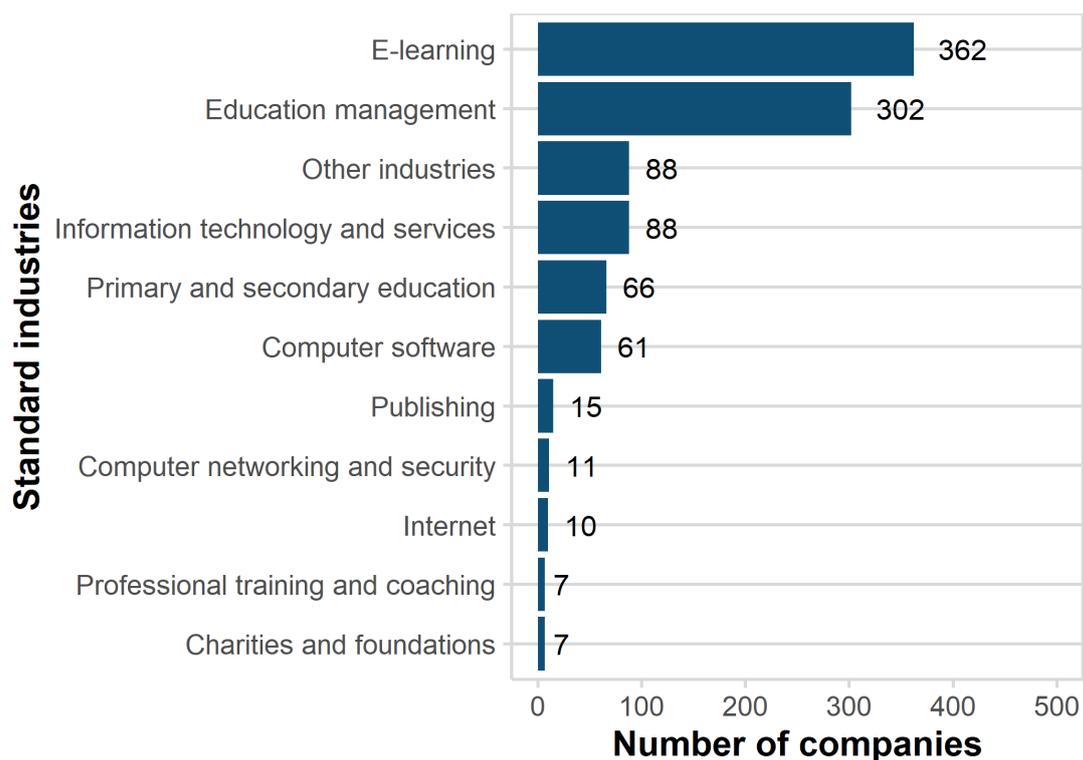
(1) Include examples of companies that matched the most common keywords in each market segment in the products and services category

(2) Include examples of companies that matched the most common keywords in each market segment in the applications category

(3) Include a mix of well-established companies and start-ups (based on year of establishment)

²⁹ For example, computer games, media production, online media, consumer electronics, entertainment and leisure and computer hardware, among others.

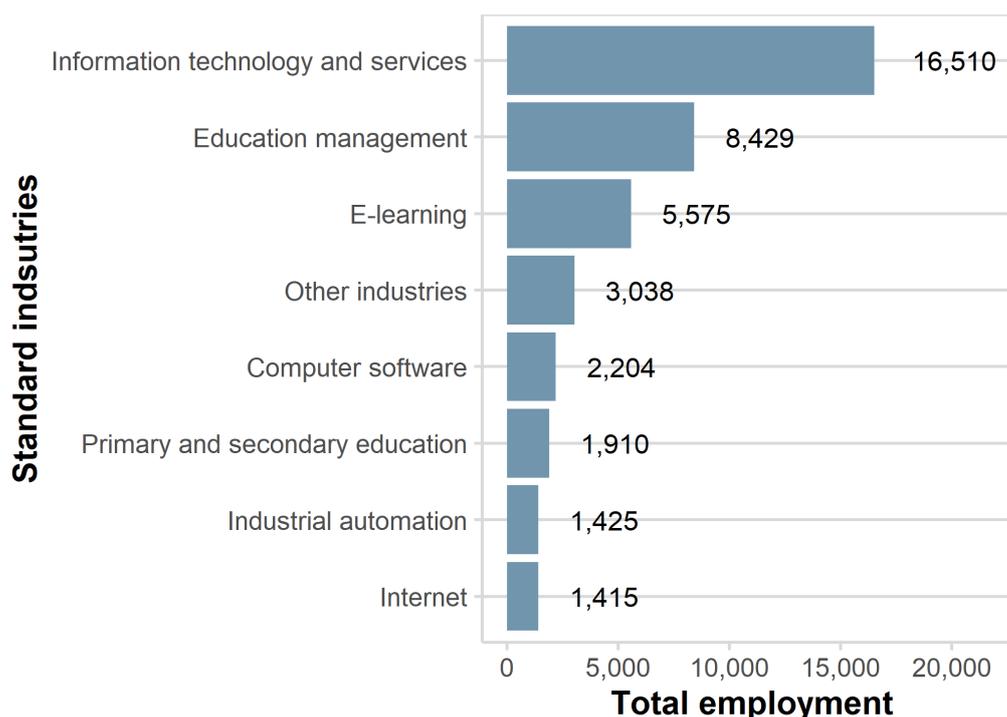
Figure 12: Number of companies by industry



Source: Frontier Economics analysis of Glass.ai

We obtained similar results when we looked at the number of employees by sector: the top 10 industry categories employed 90% of people working in the EdTech market. 'Information technology and services' is the largest industry, accounting for around 40% of jobs in the market, followed by 'education management' and 'E-learning' with 21% and 14%, respectively.

Figure 13: Estimated employment by industry



Source: Frontier Economics analysis of Glass.ai

Composition of the EdTech market in England

Firm size

In line with the typical definitions used by statistical agencies, we classified EdTech companies by size based on the number of employees. We categorised companies as micro (with 10 or fewer employees), small (with 50 or fewer), medium (with 250 or fewer) or large (more than 250 employees). Information on the number of employees is available for 692 companies, 68% of our data set.

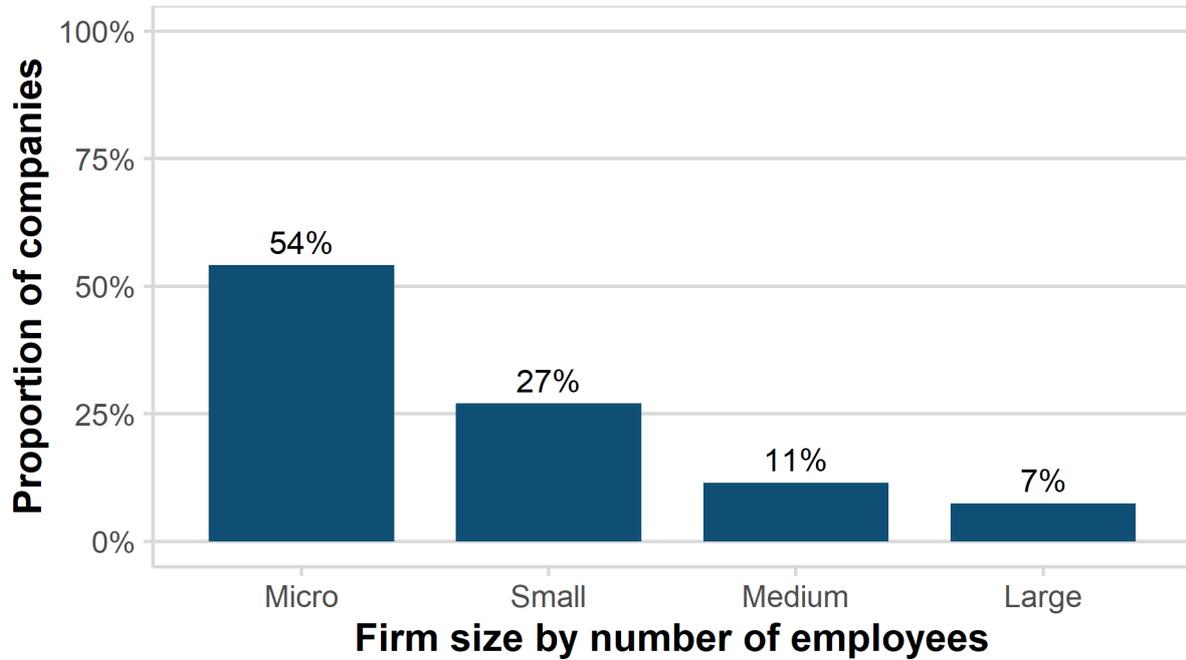
Figure 14 shows the distribution of companies and total employment by firm size. We can see that 93% of EdTech suppliers are classified as SMEs while 7% are large companies. As context, less than 1% of all UK businesses and of those in the ICT sector are large companies, so this group is over-represented in this market.³⁰ Large companies in the market also have a prominent role when it comes to employment. As Figure 15 shows, they employ more than 60% of people operating in the market, compared with 30% across the UK economy.³¹

³⁰ ONS, [Business Population Estimates 2021](#).

³¹ ONS, [Business Population Estimates 2021](#).

This result does not depend on the missing data. In particular, it is likely that the other 325 firms are smaller than those for which job numbers are available. However, even if we assume that all these companies were SMEs, the proportion of large companies in the data set would be 5%, still more than the average for the whole UK economy.

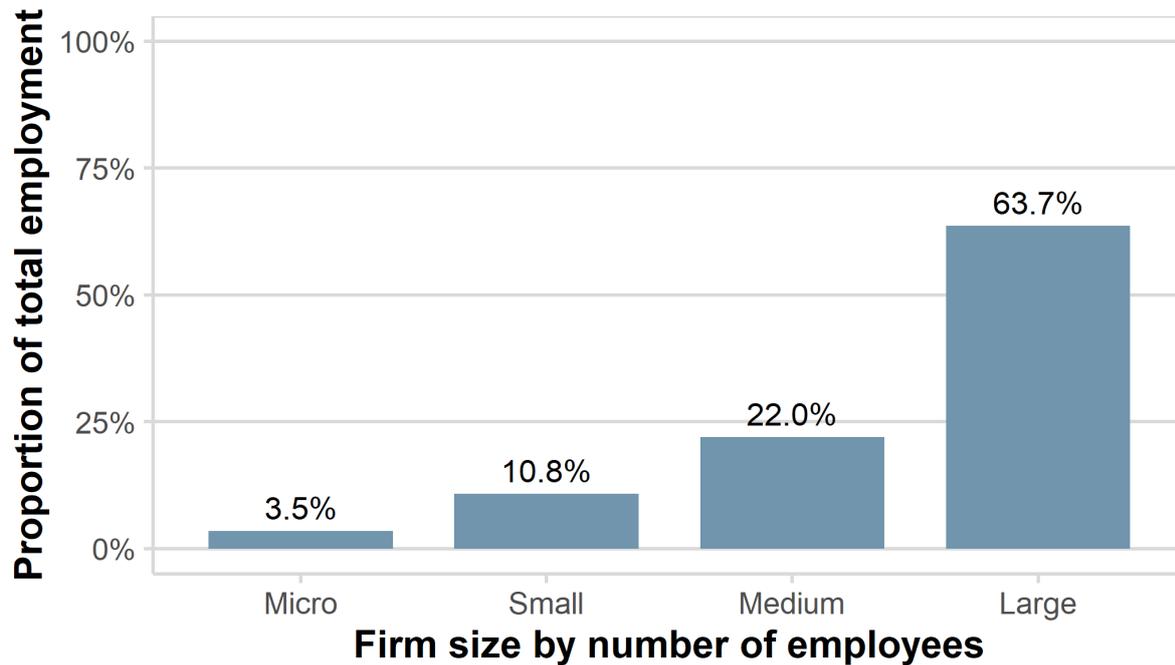
Figure 14: Proportion of EdTech suppliers by firm size



Source: Frontier Economics analysis of Glass.ai

Note: Firm size based on typical definition used by UK statistical agencies. Employment data available for 68% of companies.

Figure 15: Estimated proportion of employment by firm size

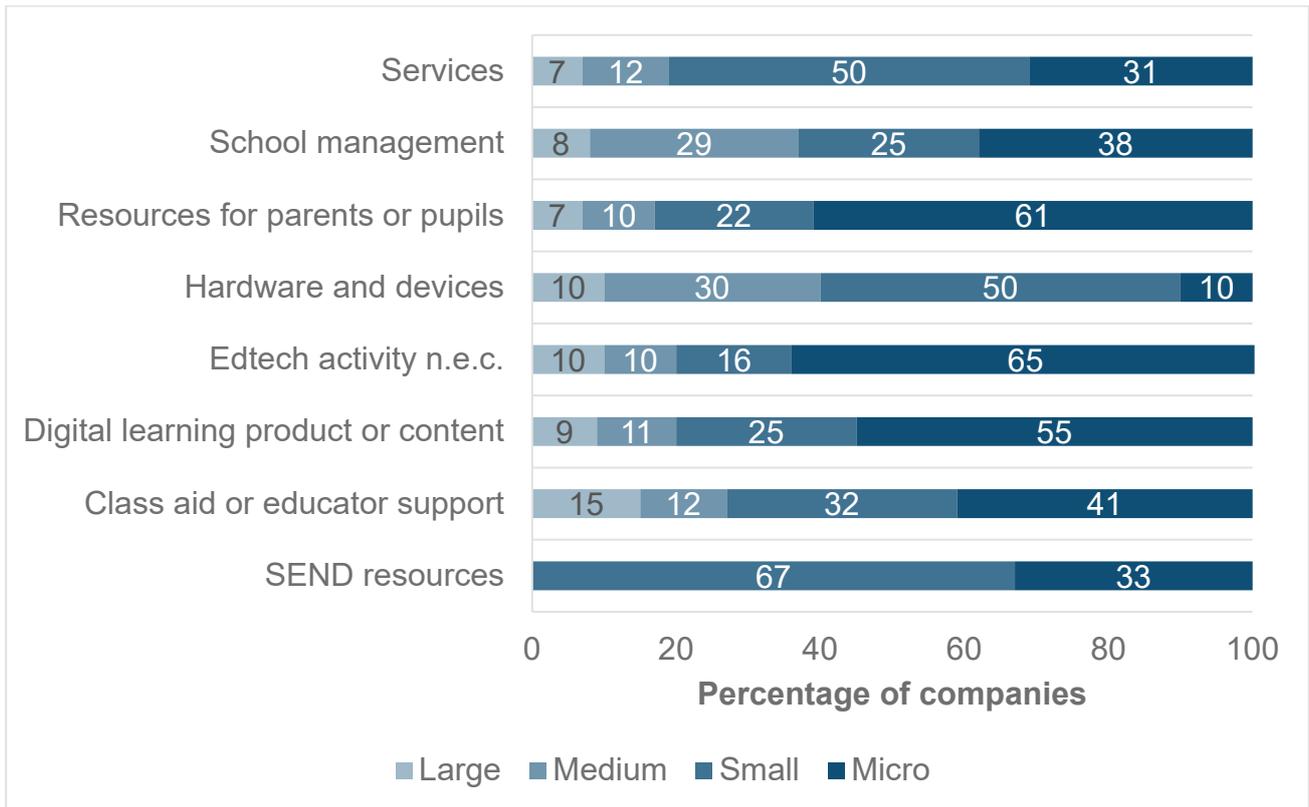


Source: Frontier Economics analysis of Glass.ai

Note: Firm size based on typical definition used by UK statistical agencies. Employment data available for 68% of companies.

When findings on the number of companies and total employment are disaggregated by market segment (Figure 16 and Figure 17), we find a higher proportion of large companies among suppliers of (1) class aid and educator support, and (2) hardware and devices. In contrast, SEND resources is the market segment with the largest proportion of SMEs. Large companies are more likely than SMEs to work across several domains: 75% of large companies in our data set are active in 2 or more domains, compared to 44% of SMEs.

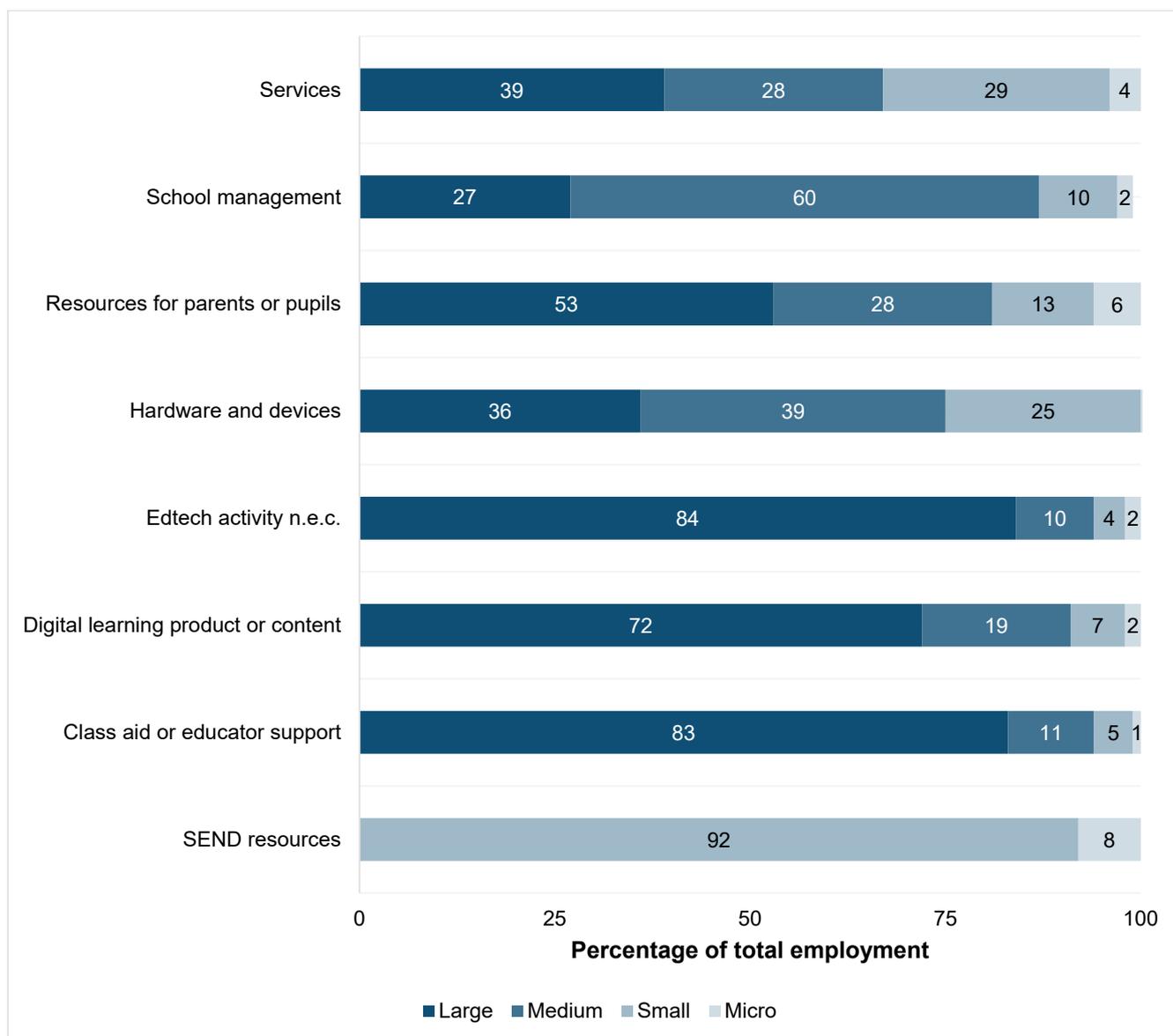
Figure 16: Proportion of EdTech suppliers by market segment and firm size



Source: Frontier Economics analysis of Glass.ai

Note: Firm size based on typical definition used by UK statistical agencies. Employment data available for 68% of companies.

Figure 17: Estimated proportion of employment by market segment and firm size



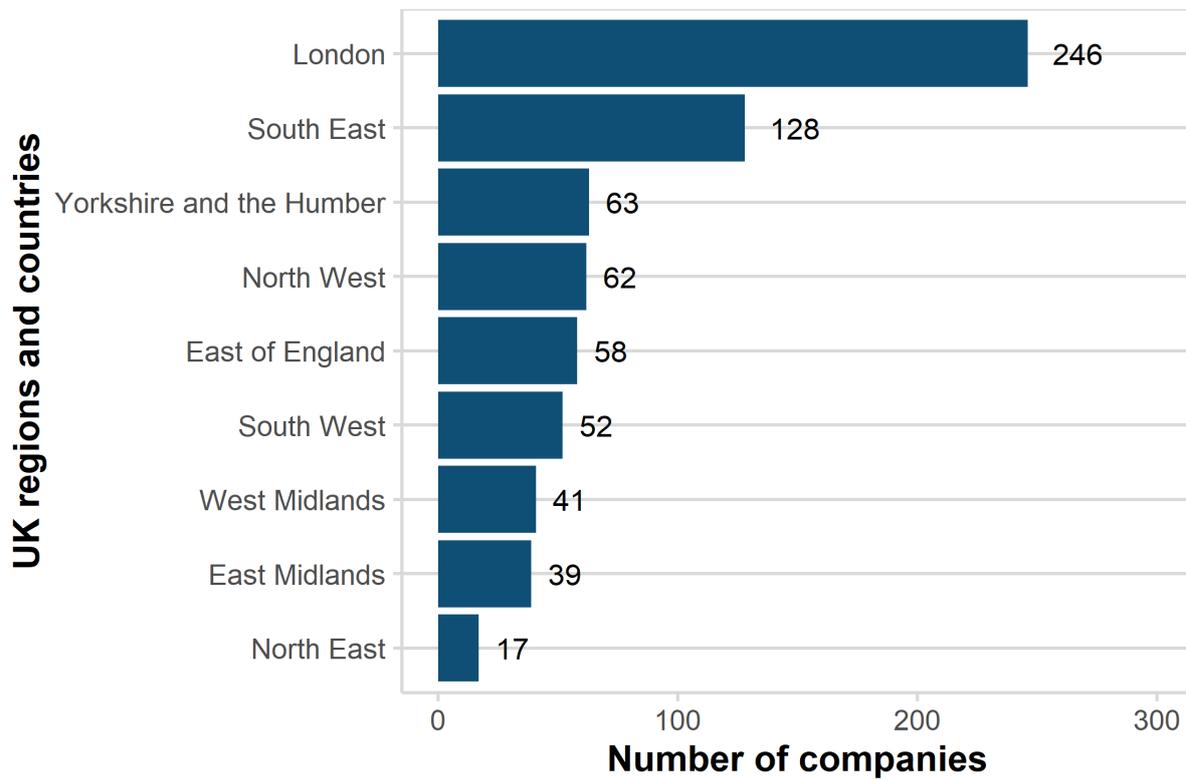
Source: Frontier Economics analysis of Glass.ai

Note: Firm size based on typical definition used by UK statistical agencies. Employment data available for 68% of companies.

Location of companies

We examined where EdTech suppliers are based in the UK using location indicators gathered by Glass.ai from companies' websites. Overall, postcodes are available for 66% of companies in our data set. Figure 18 shows the distribution of companies by region. We can see clear clusters around London and in the South East. These account for 39% and 18% of companies, respectively.

Figure 18: Number of companies by region

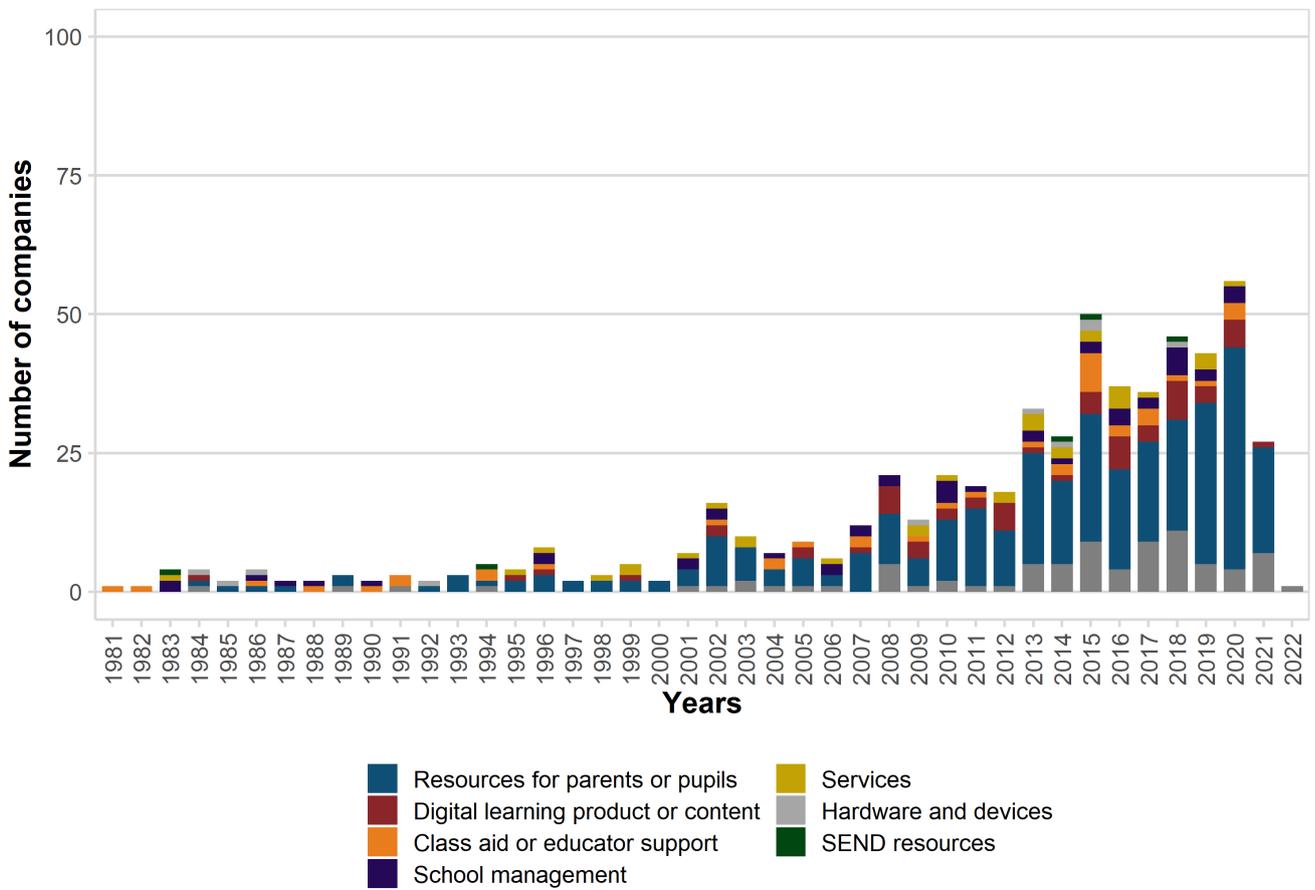


Source: Frontier Economics analysis of Glass.ai

Market entry over time

Information on the year when active companies were legally established is available for almost 60% of observations in our data set. As Figure 19 shows, the number of newly established firms has increased considerably in the last 10 years, with a large jump in market entry in 2020. Consistent with the distribution of companies in the EdTech market, the market segment with the highest number of firms founded during this time was ‘resources for parents and pupils’

Figure 19: Number of companies by established year



Source: Frontier Economics analysis of Glass.ai

Using EdTech products

This chapter explores the different EdTech products and services used by schools, the problems and challenges these aim to address, and future priorities and gaps in the markets. The chapter is based on findings from the in-depth interviews with school staff, supplemented with relevant information from interviews with sector experts and our literature review. It should be noted that the qualitative findings are from a small sample, with respondents holding a range of responsibilities, and therefore should not be considered as representative of all schools.

Approach to using EdTech

To understand why schools use EdTech and their future demand for different products and services, it is important to consider where a school is on its EdTech 'journey' and how it sees it informing its practice going forward. Recent research highlighted the importance of 3 key pillars – technology, capability and strategy – in a school's likely levels of digital 'maturity' (CooperGibson Research, 2022). The experts interviewed also highlighted (1) the importance of having a digital strategy that summarises the problems a school would like to address with EdTech, and (2) that this strategy should achieve buy-in at all levels within a school.

Use of EdTech pre pandemic and onwards

Prior to the Covid-19 pandemic, the extent to which schools used EdTech varied significantly, and it has continued to vary since the return to face-to-face learning. While our research did not aim to measure school's specific levels of digital 'maturity', the schools interviewed mostly fit into one of the following 3 categories of EdTech use prior to the pandemic:

- **established:** the school had a significant EdTech offer in school management, education and learning and pastoral support which was underpinned by clear strategy and buy-in from senior leadership
- **emerging:** the school was in the process of developing and increasing its use of EdTech and was working towards a clear strategy
- **early stage:** use of EdTech was focused on specific challenges and was not underpinned by any particular strategy or senior leadership buy-in

For schools with a more established EdTech approach, the pandemic had limited impact on their overall strategy upon the return to classroom learning, and they went back to using approaches they had previously implemented. In some cases, these approaches were further refined by their experiences of remote teaching and learning. EdTech approaches in 'emerging' schools accelerated as a result of the need for remote teaching

and learning and these schools are now using EdTech more routinely and more effectively. Schools that were in the earlier stages of their EdTech journey pre pandemic had mixed views on how remote teaching and learning had impacted them: some had returned to their previous approach, using limited EdTech, and others had now embedded this more into their practice.

“The focus is I think is just on maintaining what we've had, but also using that within lessons as well now. So there's a kind of hybrid kind of model where people have I think I've woken up a little bit more to how technology can be used definitely. And especially with things like assessment and low stakes quizzing, but also using [platforms] for homework and stuff like that alongside the traditional face-to-face teaching.” (Senior leader, secondary, academy)

Differences in EdTech approaches were typically driven by (1) the extent to which senior leaders within an individual school thought EdTech would benefit their staff and learners, or (2) the extent to which executive bodies (eg leaders in academy chains or local authorities) wanted to introduce more EdTech into their schools. The following examples show 2 extreme cases.

Pen portrait: The benefits of a full EdTech strategy

Under the leadership of the headteacher, a secondary academy has prioritised embedding and driving EdTech forwards over the last 6 years.

“I've got a passion for EdTech myself. So I'm quite techie... I've also done a lot of work with other schools, both nationally and internationally for various programmes, trying to support other schools to embed EdTech, and now we're on the EdTech Demonstrator programme.”

After considerable research, the school changed its management system to a cloud-based system, which can handle many more oversight, administration, communication and pastoral functions. It got rid of its servers and IT suites and moved to an entirely cloud-based system. Every student and member of staff has their own laptop, which works seamlessly with their virtual learning environment and the cloud-based pupil data management system. A large initial investment was required for this overhaul, but the school will make substantial savings over the long term. Everything was in place for remote learning at the start of the pandemic, and the school's EdTech systems will carry it into the future.

“The strategy base is to make sure that our workflow for students, staff, parents, everybody, is very efficient, smooth, easy, quick. So when I first got here, the amount of money the school was spending on software and things like that was huge. We just stripped that back completely.”

Having standard VLE, hardware, and management systems, rather than using a range of platforms and devices, also makes routine tasks easier. Staff no longer need to learn to use different devices and systems or have multiple logins. All staff have a single login for their laptops which provides them with access to everything they need.

“Using all of the VLE stuff is amazing. If you don't have to remember 15 different passwords and logins.... You do a document in one area, and you can access it in another. That's brilliant. And that's what saves us a lot of time and a lot of hassle and gives us more time to do the actual teaching.”

(Senior decision makers and teachers, secondary, academy case study)

Pen portrait: A limited approach to using EdTech

A primary school with a creative focus continues to be 'old school' in its ethos and approach to EdTech. The school does not believe that EdTech is a key priority, either in teaching and learning or in school management. The school uses an electronic administration system, but most teaching staff do not have access to it. For example, teaching staff need to go to the school office to get the information they need (eg parents' and carers' phone numbers). The school still uses a paper diary for school events or class visits. There have been a few requests from staff to update the approach to the management system, but the head believes the current system works well.

Within classes, the register is taken on paper and the children use exercise books for all their work. The head and many of the staff believe that there is no substitute for a teacher at the front of the class and that extensive use of EdTech will not meet all their students' needs.

“You have to look at your kids as individuals. There are some who are going to be a whiz on a computer, and they are going to thrive on that. But there are some kids who enjoy writing, a lot of kids enjoy art. And if you made it all computing based, then you're not hitting the mark... you've got to have a real balance, so that all of them feel engaged.”

During the pandemic they delivered remote live lessons using a video-conferencing platform. Post pandemic, everything has gone back to the way it was before, and this seems to be supported by staff.

“We wanted to go back to how kids knew it beforehand, with us at the front of the class and a book and a pen, and we wanted that to happen as quickly as possible... We are quite old school really... I believe the learning cannot be better than a teacher at the front of the class and children sitting writing using a pen. Because even in year six, I noticed when I took them back after the pandemic, their fine motor skills were all over the place.”

(Senior decision maker, primary, local authority)

Objectives for EdTech products and products

As noted previously, the extent to which EdTech is used in schools depends on (1) whether they have clear objectives for this technology, and (2) whether the specific problems it can address, and the benefits it might have, are well-defined. Interestingly, the interviewees described the EdTech they used in terms of the benefits it could offer rather than the problems it can address. In some instances, respondents also identified wider unexpected benefits and uses for EdTech once systems had been implemented.

The schools interviewed typically used EdTech in their schools for 2 overarching objectives, either for it to have a **whole-school impact** or for it to meet **curriculum specific objectives**. These distinctions are key for this research as this can significantly influence the nature of a product and its cost and resource implications. As such, schools frequently have different approaches for identifying and making decisions about products in these categories.

Whole-school impact

Many of the schools interviewed used EdTech to have a whole-school impact for staff (to help reduce workload and to improve planning and communication), pupils (to help improve accessibility, engagement and outcomes), and parents and carers (to improve communication with the school and understand pupils' progress).

This is consistent with the 2020-21 DfE EdTech Survey (Department for Education, 2021), which found that EdTech can reduce teacher workload in assessment, management and communication. The survey found that 74% of headteachers and 65% of teachers had indicated that technology had reduced workload or would do so in the future. Headteachers emphasised that technology had also saved time on management (financial, pupil data, timetabling) and communication tasks (governance, engaging with parents and carers). Teachers reported that technology had saved them time for collaborating and sharing resources with other teachers, tracking pupil progress, planning lessons or curriculum content and delivering lessons.

These impacts were typically targeted in one or more of the following areas: school management and administration, support for teaching and learning, and pastoral support. The whole-school use and benefits of EdTech in each of these areas is discussed in the following sections.

School management and administration

Schools interviewed (across different phases and types of schools) were mainly using specific tools and platforms which allowed them to undertake the day-to-day

management and administration of the school more effectively. This included the following.

Pupil data management

Most of the schools interviewed used at least one EdTech product for managing pupil data, including pupil details, contact information, attendance, behaviour and performance.

Schools favoured systems that allowed them to link different data. These systems helped them to gain an overview of both individual learners and learner groups so that they could (1) effectively monitor their progress and target support, and (2) report on progress to senior leaders, governors, and the Office for Standards in Education, Children's Services and Skills (Ofsted). Several respondents noted that these systems had allowed staff to prepare reports considerably quicker.

“The fact that [the management system] talks to [the safeguarding system] has been an absolute revelation really...it's really streamlined things and it's meant data that could take absolutely ages to crunch manually was just there.” (Senior leader, special school)

To allow school staff to make the most effective use of data management systems, in some cases, schools had introduced compatible ‘add-ons’ such as provision mapping software, planning and behaviour management software, and progress tracking and assessment software.

Schools used a range of cloud-based and non-cloud-based management systems. Views on these systems ranged considerably depending on the perceived quality of the interface, and the speed and ease with which they could access the information required. Some respondents noted that they used compatible add-ons to engage with systems more effectively. Several noted that they liked using online and cloud-based systems as they felt they were easily accessible and quick to use remotely.

“Because we use a system in the cloud, I can do my register on my phone. So as they come in the door, I'm doing my register... So there's no delay in terms of students coming in, they start, they're already engaged, they're ready to go. We're not faffing around trying to log into anything, it's all up.” (Senior leader, primary, academy)

Some respondents mentioned that their school had considered switching products. However, they noted that this process was quite complex due to the significant time and resources needed to assess replacements and manage the resources needed to switch and roll out a new product of such significance.

Engaging with staff

Some of the schools interviewed used software platforms to engage more effectively with their staff in terms of day-to-day communication, updating and sharing school policy, providing training, and sharing resources for curriculum planning and delivery. This made certain tasks, such as booking physical resources, easier for staff to complete.

“Now we have like a virtual calendar [on a shared platform]. So if I want to use the hall, or there is something I need to book out, or I want to book a school trip. I'll do that via the whole school calendar that everyone has access to.” (Middle leader, primary, local authority maintained)

Sharing curriculum resources was seen as the main advantage of this type of products, with many interviewees feeling they benefitted from having ready access to existing information. This was particularly advantageous for schools in academy chains, as they were able to share resources across different schools.

“[Software platform] was a really good way for us to share resources.....So teachers across the four schools can share practice and share resources, which is really good. [Prior to the pandemic] we didn't really know the other people within the schools. So now, we've set up files and good practice and good resources, we often share them.” (Senior leader, primary, academy)

Similarly, a few schools had found that CPD could be effectively delivered online (particularly during remote working), and they felt they had benefitted from reduced travel, time and costs for training that might otherwise have been incurred.

In several cases these platforms had been in place prior to the pandemic, while many schools had implemented these during the requirement for remote learning. Most schools had chosen to continue with these solutions since the return to face-to-face learning.

Engaging with parents and carers

Most schools interviewed were also increasingly using EdTech solutions to engage with parents and carers. These included:

- sending general communications to parents and carers through agreed platforms
- providing information and policies online
- sharing examples of their children's work and progress online
- conducting parents' evenings online
- sharing online resources to support their children's learning at home

Schools felt parents and carers benefitted from this approach as it enabled them to track more of their children's work and progress. It can also be more accommodating for working parents and carers and for families with complex parent/carer arrangements.

A small number of schools also noted that online platforms and resources can be beneficial for some English as an additional language (EAL) parents and carers (once they have got used to the systems) as this may give them better access to translations.

Pen Portrait: Ensuring parent access through translation

One school interviewed had a high number of EAL parents and carers, with some not speaking any English. This can cause challenges when communicating about their children's work/progress or sharing general school information and messages. The school updated its website to ensure it was translated into various languages to improve accessibility and parent engagement.

"Our website, now they can click it. So it comes into different languages as well. So that supports parents, and we've got quite a lot of links on our website, I think our website is definitely something that really improved. Post lockdown. So all the home learning was sort of on the website, and I think parents are looking at the website a lot more than they would have before."

(Senior leader, primary, academy)balance, so that all of them feel engaged."

During the pandemic they delivered remote live lessons using a video-conferencing platform. Post pandemic, everything has gone back to the way it was before, and this seems to be supported by staff.

"We wanted to go back to how kids knew it beforehand, with us at the front of the class and a book and a pen, and we wanted that to happen as quickly as possible... We are quite old school really... I believe the learning cannot be better than a teacher at the front of the class and children sitting writing using a pen. Because even in year six, I noticed when I took them back after the pandemic, their fine motor skills were all over the place."

(Senior decision maker, primary, local authority)

Schools outlined a range of software and approaches used for engaging with parents and carers – with few sharing a common approach. These included:

- using core platforms to share work, progress information and send messages

- using other specific platforms which enable parent communication or their own websites to share work, progress information and send messages
- using video conferencing platforms for meetings and parent evenings

A few schools did still primarily use phone and hard copy letters with parents and carers, including text message software.

“Generally, for some reason, we don't tend to use email or anything with parents. I think it is just for the personal touch. You can get across what you're trying to say, and get the right tone in a phone call, more than in an email or anything else.”
(Middle leader, secondary, academy)

Support for teaching and learning

Many of the schools interviewed had chosen to make further whole-school purchases of VLEs, devices or website subscriptions. These investments were initially made pre pandemic, specifically to help support and enhance the learner experience, or during the Covid-19 lockdowns and intervening periods to support the delivery of remote learning.

Delivering teaching and learning

Where schools were using EdTech in the teaching and learning context, this was primarily to support and enhance the learner experience. Several schools used VLEs supported by devices to (1) enable staff to deliver their classroom content in an interactive way, and (2) embed quizzes for their learners to help with classroom engagement. Some schools also used VLEs to set and complete homework assignments or further learning opportunities. VLEs also enabled the option for remote teaching for schools when face-to-face teaching was not an option. A few schools also commented on how the use of learning platforms can help reduce paper costs and paper waste.

“It's more interactive for the students, like, there's something a bit more exciting about doing a quiz on a tablet than doing a quiz that's been printed out. So I do think in terms of engagement, it's definitely playing a role. Same with like homework, so a student is more likely to complete something that they can complete on their phone, or their tablet, than if they've got to get a big homework pack out and carry that home.” (Middle leader, secondary, academy)

In most cases schools chose to use commonly known VLEs from large companies which offered a wide range of options and apps which schools were able to implement and use according to their own needs. Therefore, specific patterns of usage varied considerably between respondents.

A small number of schools were not using VLEs or other alternatives since the return to face-to-face learning, preferring to use a more traditional approach.

Most of the schools interviewed had also invested significantly in EdTech devices which learners and staff could use in lessons and at home if required. These included interactive whiteboards for most classrooms, laptops or tablets for learners and staff (either one per learner where possible or as a bookable resource), and visualisers in a few cases.

Pen portrait: Innovative use of EdTech to benefit teaching and learning

A secondary academy embraced EdTech from the outset when it opened. Each student and member of staff was given a laptop. But, before the pandemic, EdTech was not used in a consistent way across the school. The pandemic provided an opportunity for all staff to engage with EdTech, and the school continues to champion this. EdTech is integrated into all subjects, and students are encouraged to use it in creative and innovative ways as part of their learning and assessment.

“We use it a lot for assessment. And because we're a ‘do not print’ school, everything is very much... Can you do this in a more innovative way? Could you do it more technology wise? It's not just students sitting down with a laptop. We were encouraged to get them to use their laptops to make a documentary about what you're teaching, or to make a podcast about it. Use what's there to develop your teaching and learning to make sure the students are active.”

The teacher interviewed currently uses various types of software alongside a VLE, including software which monitors and manages classroom noise and times groupwork, and software which allows teachers to monitor what their students are doing on their laptops and allows students to discreetly ask for support.

Social media platforms and videos were rich sources of new EdTech for this teacher. The teacher had introduced their colleagues to several solutions they first heard about on these channels.

Assessment

Some schools discussed using different EdTech systems to support assessment of learners. They expected that these systems would lead to reduced teacher workload through the automation of marking, moderation and inputting tasks.

The use of EdTech for assessment varied considerably in practice, with some using formal systems designed for assessment purposes, while others used more informal approaches such as embedding quizzes and tests using existing VLEs or specific services.

Views were generally still mixed on the likely benefits of such systems, with some respondents feeling there was still more that could be done to develop EdTech in this area or to train them on what the benefits of using existing solutions more effectively might be.

Supporting learners with SEND and language barriers

Several schools interviewed noted that a key benefit of using EdTech was enabling schools to better support SEND learners and those with language barriers. Specific benefits included:

- having access to online tools for needs assessments when learners enter the school
- enabling better access to and engagement with the wider curriculum through the use of adaptive technologies that are readily available online or embedded in different VLE platforms

Pen portrait: Learners at a special school benefitting from adaptive technology

A senior leader from a special school with learners in KS1 and KS2 had found that adaptive technologies available through their VLE were particularly beneficial for learners with literacy issues.

The school had found that learners who had difficulties with decoding and phonics were able to engage more effectively with the wider curriculum using the technologies built into their platform.

“The children are able to do what they're capable of rather than having the barrier of physically reading or physically writing. It's been really good in terms of special needs and giving the children confidence having that adaptive technology there.”

Pastoral support

Another key area of whole-school use of EdTech was pastoral support. For most schools interviewed, EdTech was particularly used to support safeguarding and related liaison with external agencies. A few also mentioned using EdTech to promote the importance of mental health and wellbeing, and some discussed how it was used to support the delivery of careers guidance.

Safeguarding

All the schools interviewed used at least one EdTech system to support their safeguarding policies and procedures. Respondents were very positive about the benefits this can have for their learners. In particular, it allowed them to better understand and monitor different events that might otherwise go unrecorded, and to build an overall picture of the children's wellbeing with input from a range of staff, preventing knowledge from being 'siloed'.

Pen Portrait: Using EdTech to assess safeguarding risks

One senior leader stated that their school had not used much EdTech as the head preferred a more traditional approach to school management and delivery. It had started using their online safeguarding system on the recommendation of its local authority to help it create a central database in the school to log any safeguarding concerns, monitor attendance and communicate with parents and carers and external agencies.

The school liked that this system allowed it to create a wider picture and record for all its learners, support their safeguarding and better target support if needed.

"It's really, really good because it allows any one of us that has dealings with the children, even the office staff, we can log everything and then siphon it out, sieve out what we need to see about one child or a whole class."

(Senior leader, primary, local authority maintained))

Liaising with external agencies

Most respondents also discussed recent changes to how they engaged with external agencies. Most meetings with external agencies relating to learners' safeguarding would previously have taken place face to face. However, during the pandemic, these had been moved online and, in most cases, had continued to be delivered online using video conferencing software.

Respondents varied in terms of the perceived benefits of this approach. They typically felt it helped with time management by reducing the need for travel but they differed in how effective they felt the approach was for levels of in-meeting engagement and outcomes for learners. Some respondents felt some parents and carers might feel more comfortable engaging online. This was because they were used to the technology, they could remain in an environment in which they were comfortable and they could choose to

go off camera if they preferred. Others felt that not observing and engaging with a person face to face reduced the effectiveness of the meetings.

Health and wellbeing support

Use of online resources to promote awareness of the importance of health and wellbeing and associated support had increased significantly since the start of the Covid-19 pandemic. Several schools noted that they had provided links to such resources in their communications to parents and carers, learners and staff. A few teachers also noted that they had integrated some wellbeing videos into their remote learning schedules.

During lockdowns, most schools had used a combination of phone calls and online meetings for health and wellbeing checks. They had found this beneficial for times when they were not allowed or able to see learners or parents and carers in person. But they had mixed views about whether this was beneficial since the return to face-to-face learning.

Very few schools mentioned wider use of EdTech for health and wellbeing, with a small number using tracker systems for recording minor injuries and accidents.

Careers support

More widely, some schools noted that they had used EdTech to support the delivery of careers support in the school, as well as for the wider personal, social, health and economic education curriculum.

Several schools noted that they had moved careers interviews online using video conferencing and had used their VLEs to develop careers resources and information which learners could access.

A few respondents also noted the intrinsic link between the use of EdTech in their schools and their learners' future careers, with employers increasingly needing staff with high level digital skills.

“It's just a vital part of their education. When these children leave school, they're going to be expected to use technology every day. No matter what career you're going to go into, you're definitely going to have to use technology in some form. And so I think it's really important that they're technologically literate and comfortable.” (Middle leader, primary, local authority maintained)

Curriculum specific objectives

Most of the schools interviewed also used specific programmes and online resources to enhance teaching and learning in different curriculum areas. As with products that had a

whole-school impact, curriculum specific EdTech products were particularly well used and valued when they were thought to benefit learner engagement, support learner progress and help reduce teacher workload.

Respondents particularly valued options that supported in-class and remote learning as well as homework assignments. This allowed them to integrate EdTech into their practice in a way that complemented and enhanced their teaching rather than replacing it. They also preferred options that could be tailored to individual learner needs and could provide useful insights through metadata into their progression and areas for further support.

Staff also found it beneficial when tools allowed them to share information and feedback with learners and parents and carers in an easy and manageable way. A small number of teachers did note that increased learner and parental communication in this way needed to be carefully monitored, as it could lead to an increase in 'out-of-hours' queries, which could add to teacher workload.

Future priorities and gaps in the market

Our interviews with schools and experts explored where they felt there were currently gaps in the EdTech market and what further developments they believed would benefit the development of the sector.

As noted previously, most of the schools interviewed had either an established EdTech approach within their school or had accelerated the process of embedding this over the last 2 years. These approaches typically included the use of EdTech across school management and administration, teaching and learning, and pastoral support. Only a small number of the school staff interviewed believed that their school would continue with a limited use of EdTech.

When asked about future priorities, schools often noted that they wanted to spend time further consolidating and evaluating their existing practice, before making any widespread changes. Some schools were going through or had recently completed a process of reviewing and rationalising their EdTech use (this process is discussed further in the following chapter on choosing EdTech products). One senior leader noted that it was important for their staff to use their existing EdTech effectively, rather than focusing on new products that require further training, given they had been through a significant period of change since the start of the Covid-19 pandemic.

Some schools highlighted the need to grow the number of devices, such as laptops and tablets, that they had and wanted to ensure that all learners had their own. A few noted that this was particularly important for learners from more deprived backgrounds who might not have access to devices at home. As a consequence, this group of students could struggle to complete homework online or benefit from opportunities to undertake further learning at home.

A few schools were also considering the extent to which their current management system met their needs, and whether they wanted to consider replacing it. For some, the resources involved in replacing their systems and appropriately reskilling users was a significant potential barrier to making such a change.

“[Management system] isn’t great sometimes, but at least we know how to do it or who to go to, who will know how to do it. Whereas a brand new MIS could take months for people to be able to get their heads around.” (Senior leader, secondary, academy)

Several schools also highlighted specific challenges to further future growth. These included (1) budget constraints, (2) issues around connectivity in their area, and (3) the need to maintain, update and replace their existing EdTech devices, which can be costly.

In terms of gaps in the EdTech market, schools and experts interviewed highlighted the following areas where they thought products could be further developed and improved.

Multi-functional and compatible administrative and monitoring tools

Schools interviewed highlighted the importance of multi-function administrative and monitoring tools which allowed them to link different types of data (eg pupil demographic data, performance data, safeguarding information, attendance data and behaviour data). Having access to this type of information was seen as crucial for monitoring and supporting learners, and for reducing teacher workload for reporting to SLT, governors, and Ofsted.

Several schools felt that existing systems could be further improved or updated/replaced in order to link different data effectively and to ensure interfaces were user friendly and easy to access (eg from phones and tablets).

Experts noted that schools were increasingly demanding dashboards with multi-access functionalities to consolidate the reporting of scattered digital activities. In particular, larger MATs would like to be able to monitor and assess aggregate impact and for stakeholders to have greater visibility into what services were being delivered and how they were being delivered.

Improved assessment tools

Schools interviewed identified the further development of assessment tools as a key area for improvement. Teachers frequently highlighted marking as a time-consuming task and reducing the time it required would help to reduce their workloads.

Some schools noted that assessment tools were currently somewhat limited in terms of what they could reasonably offer. For example, they could be used for marking quantitative tests but would not be able to interpret qualitative material. A few schools also noted that some assessment tools also required additional inputting work, which they felt was adding to their overall workload rather than reducing it.

Key improvements were identified around (1) how test scores can be input or imported into systems more efficiently, and (2) how assessment tools can become 'smarter' to offer more analytical tools to help assess learners and identify where further support is needed.

Products that enhance and add value to existing approaches

Experts interviewed also noted how EdTech can complement other learning activities and should be designed with this goal in mind. Experts emphasised that it is possible to develop a digital product that reproduces the kind of learning experience that can be delivered through other means (whiteboards, slides, etc). For EdTech to effectively complement other classroom tools, it should focus on areas where it could deliver unique value. These included individualised learning, visual learning, reward design to motivate students and, potentially, VR/AR.

A few teachers also highlighted the potential benefits that VR and AR could have for learners. In particular, one senior leader from a special school noted that this could open up many further learning enhancement activities and extracurricular opportunities for their learners.

Several school staff also highlighted that products which could be used both in and outside of the classroom were also beneficial in enabling additional learning to continue at home if the learner wanted or by supporting specific homework tasks.

Supporting SEND students

A few school staff interviewed highlighted the challenges of supporting vulnerable and SEND pupils. They wanted to find more innovative ways to integrate EdTech to support them and help with their particular challenges, and to make sure that they were able to access EdTech in the same way as their peers.

Safeguarding, data protection and cyber security

A few schools commented on the ongoing challenges of safeguarding in the online learning environment. One reported that cyberbullying was becoming an increasing issue. Some schools had produced and revised policies to promote safeguarding for remote teaching in the pandemic. One school called for online safeguarding in education

to be further regulated by DfE, accompanied by support and resources for schools specific to the remote learning context. It felt that this would relieve some of the current burden from schools and teachers. A few respondents also noted the need to ensure that products had high quality cyber security and data protection approaches.

Choosing EdTech products

This chapter explores how schools make choices relating to different EdTech products, who is involved, how they gather information and the key criteria that inform their ultimate decisions. The chapter is based on findings from the in-depth interviews with school staff and sector experts as well as from our literature review.

Structures for choosing EdTech

The scale of procurement decisions varies widely in England. At the smallest scale, individual small academies make independent EdTech procurement decisions. Local authorities, schools with joint procurement processes and large MATs make large scale procurement decisions. The shift away from local authority procurement towards autonomous academy procurement has increased the number of EdTech transactions in England in recent years. The scale and number of procurement decisions have various implications for EdTech provision.

How schools interviewed identify and choose EdTech products and services varied based on a combination of factors. Typically, this included:

- **The extent to which a school had oversight from their MAT or local authority.**

While individual schools had previously experienced some autonomy over the products they used, they were increasingly experiencing more involvement from their MATs or local authority, and they expected this to increase over time.

In some instances, this had helped to reduce some of the burden on schools in terms of decision making. They were also able to benefit from the knowledge of colleagues to understand potential benefits and limitations, as well as advice on implementation.

In other instances, schools found this frustrating as it could slow down the overall decision-making process for school-specific requests or a particular product might not be consistent with their own preferences.

- **Whether the school had a clear SLT process and tools for purchases of different values.** Some schools were clear on the exact steps for purchasing EdTech and had established formal processes for this, including which staff needed to be involved in decision making. In some cases, this allowed senior leads to review different requests and identify areas for streamlining and rationalisation prior to purchase. Other schools were less formal in their approach, allowing more flexibility for staff and a nimble approach, but this could lead to potential duplication.
- **Whether the solution being considered was intended to have a whole-school impact or curriculum specific impact.** The scale and likely cost of products that

had school wide impacts were typically significantly larger than those for curriculum specific products. In these instances, schools were more likely to use senior leadership structures (both within their school and in associated trusts) to purchase whole-school solutions, while curriculum leads were more likely to drive EdTech decisions for their curriculum needs.

Due to the different benefits and challenges associated with these factors, most schools interviewed used a combination of top-down and bottom-up approaches for making EdTech decisions.

A small number of schools interviewed used a top-down only approach, with the school's senior leadership (or in some cases academy leadership) being quite prescriptive about the EdTech being used across all levels of the school. A few teachers in schools where the senior leadership did not want to use EdTech felt that a bottom-up approach could be implemented by introducing EdTech solution options at the curriculum level, and by effectively utilising any devices and EdTech available.

Top-down approaches

Top-down approaches were typically used for purchases with significant cost and resource implications that aimed to have a whole-school impact. In most cases, top-down approaches were used to purchase the following type of products:

- pupil data management systems
- VLEs
- devices
- parental engagement platforms and tools
- tools for assessment
- safeguarding systems

Top-down approaches were typically led by senior leaders either at an individual school or MAT. In a small number of instances, local authorities worked with local schools to help them identify effective EdTech solutions.

Various senior leaders, such as heads and executive heads, strategic EdTech leads for the school (if this was not the head it could be a deputy or a school business manager), could be involved in top-down decisions. During the process of choosing EdTech, senior leaders could ask middle leaders and wider staff to participate by testing different product options and feeding back their preferences.

Pen portrait: Changing the management and administration system

Under the strategic direction of the headteacher, a secondary academy started to overhaul its EdTech in 2015. This included changing the school management and administration system which it felt did not offer the multi-functionality it would prefer. It wanted a single system which would store pupil data and handle a wider range of day-to-day functions, such as communicating with parents and carers.

The head worked closely with one of the assistant heads and the school's IT learning lead to research alternative systems and suppliers. They kept the following priority drivers in mind during their considerations: (1) ease and efficiency for all users (students, staff, parents and carers), (2) improved workflow, (3) reduced workload, and (4) saving money in the longer term. Unlike many other schools it had worked with, it was its practice to consult with teaching and support staff when making major purchases.

“When we purchase things... we bring people into the school. We get them to meet with all the stakeholders at various points. So, they spend some time with the teacher, they spend some time with support... I think that's sometimes something that we take for granted especially when we work with other schools and see how they purchase.”

After 3 years of research and planning meetings with providers, consulting with their own staff and visiting other schools to see how things worked in practice, the school decided to use a cloud-based software.

“It was three years of quite long detailed meetings with the companies, also checking around their research and development and how much they develop and how much they receive feedback. And visiting schools to see how it's implemented on the ground.”

The new system handles all their management and administration functions as well as pastoral support, parent and guardian communication, and student homework. There is also a safeguarding module which can link to the Child and Adolescent Mental Health Services. Switching to this system has saved them a considerable amount of money in terms of streamlining systems and staff time.

“Just by switching, we probably saved probably about £25,000 a year. And then you can invest that money into the infrastructure.”

(Senior decision maker. secondary academy)

Bottom-up approaches

Bottom-up approaches were typically used for lower value purchases that had curriculum specific objectives. In most cases, this was led by curriculum leads and individual teachers who wanted to use specific EdTech solutions in their teaching.

In some instances, curriculum leads had a budget allocated to them which they could determine how to spend. In other instances, teachers and leads needed to make a specific business case to the SLT for the product to be purchased.

Pen portrait: EdTech decisions for specific curriculum areas

A middle leader at a primary school had responsibility for choosing EdTech solutions for the English subject. Conversations with colleagues in other schools in their network helped with making a lot of the decisions:

“We'll share our experiences. And then I'll go and have a look at what they're doing and see what they're using and how they're using it.... And that informed by a lot of my decisions, if I can see it in practice somewhere else, and it's being used effectively.”

The middle leader also used the following criteria to decide whether a piece of software would be suitable:

- Is it engaging, interesting, will the children enjoy it?
- Is it fit for purpose?
- Will the children learn something from it – ie it is not just playing a game for fun?
- How do you access it – from an app or a browser – and how easy is it for teachers and pupils to access on a tablet or a laptop?
- How easy is it to use?
- How does the cost compare to similar products, and does it fit the budget?

The leader also liked to trial software with their class or year group before suggesting to the SLT to buy it. They carried out before-and-after assessments of class progress, as this demonstrated the software's effectiveness. A favourite piece of teaching and learning software was seen as particularly beneficial as (1) it could be tailored to each child's needs, and (2) it could help children whose parents or carers had English as an additional language to overcome language barriers.

Collecting and assessing evidence on EdTech products

When deciding between EdTech options, schools must weigh different types of evidence. Both the schools and experts interviewed and the literature review highlighted that word of mouth and web searches are the most common ways of finding EdTech evidence, with use of existing research evidence less likely to be used.

Word of mouth

Most of the schools interviewed mentioned the importance that word-of-mouth recommendations can have for their decision making. Most favoured speaking to another school or individual teacher about other forms of information as they felt these were more likely to be trustworthy and based on real-life experience.

“Coming from other people and people that you can trust – because you know they're not out to compete or anything like that. It's priceless, really.” (Senior leader, secondary, academy)

“A lot of it is sharing best practice really...rather than researching we'd probably ask others what they're using and go from there.” (Middle leader, primary, local authority maintained)

In some instances, the colleagues they engaged with had worked with them previously or were part of a specific local or discipline-specific forum or network. In other instances, the school leads had contacted their counterparts at schools which they knew had used a certain product or approach.

The literature review found that personal recommendations between teachers can drive uptake of particular products (Cherner and Mitchell, 2021; Wright, 2021). Products developed by teachers and students were typically initially marketed to schools in their professional or personal network, leading to clusters of schools (eg 50 to 200 schools) using particular small scale products.

Online searches

Our literature review found that schools look for EdTech products through internet searches and providers' websites, which is consistent with findings from our interviews with schools. As a result, the search result positioning of products could be influential as school staff noted that they do not typically have much time to review different options.

In addition, positive review ratings on providers' websites and the position of the reviewer (similarity of the school or role of the reviewer) may influence procurement decisions. In a

few cases, the schools interviewed mentioned that they might consider reaching out directly to speak further with schools which had left positive reviews.

Use of existing research and evidence

External evidence

In addition, the literature review found that EdTech evidence websites, trade publications and industry guidelines were other sources of information for schools. These included sites such as EdTech Impact, Innovate My School, the EdTech Evidence Group, ImpactEd, Teacher Tapp and the Assignment Report. The schools interviewed did not mention these specific sources, but a few mentioned finding the EEF website beneficial for understanding how effective different products and approaches were.

“I love the EEF because you can filter off what research you want. And you can look at how effective things are, they've got their own ratings system and that's really good. And that research is obviously validated research.” (Senior leader, special school)

A few schools interviewed also mentioned attending the Bett conference to find out more about new technologies, meet providers and see live demonstrations.

When using these platforms and information sources, schools tended to seek out evidence from other schools that were similar to themselves. Experts noted that marketing was more effective when it provided schools with robust evaluation evidence, and several of the schools interviewed noted that they would prefer to understand how technologies would be effective and could be implemented in their specific context.

Internal evidence

Some of the school staff interviewed also outlined how their own schools collected evidence to inform their decision making. While this was not used for all purchases and not something all schools did, some ensured that they undertook trials of different products prior to purchase, and they collected staff and learner feedback on these where possible. A few also noted that they might revisit staff and learners periodically to understand if a product was still effective and if there were any issues or gaps that needed addressing.

“Normally when something comes to the end of a contract they do send a message out to ask ‘what are your views on this software, is it worth keeping’. And then if it's not, that leads to a wider discussion of what we can use to replace it or what we can use instead of.” (Middle leader, primary, academy)

Key criteria used in EdTech selection

The literature review and expert interviews found that marketing and sales outreach to a school can be expensive for EdTech companies, while school interviews found that a poor purchase can have significant negative impact on a school's budget and resources, as well as on trust in its senior leadership.

The research found that schools tend to have relatively low churn rates for EdTech products (anecdotally, <10%), often due to the effort involved for schools to switch products. Therefore, convincing a school to switch products involves demonstrating that the alternative product will deliver more value and that this benefit outweighs the costs of switching. The difficulty of assessing the value of EdTech products through existing research and evidence may add to schools' reluctance to switch products.

Understanding the criteria against which schools make EdTech decisions is therefore important to ensure that sales are appropriately targeted (to ensure the cost-effectiveness of marketing strategies) and offer the best value for schools.

Our literature review found that it is more cost effective for EdTech companies to focus marketing and sales efforts on larger buyers. This has the potential to create more intense competition among EdTech providers for large buyers relative to smaller buyers, which can take the following different forms:

- competition on the price offered to schools
- competition on quality, for example in the set of products bundled together or in the intensity of training and support services offered

This is mostly consistent with the criteria that the schools interviewed considered most important when making EdTech decisions. These included:

- Cost and ensuring the product meets the schools budget requirements and limitations. Ideally a product should show added value for money by being multi-purpose for home and in-person learning.

“It's always down to cost at the end of the day it could be the best piece of software in the world, but if I can't afford it, I'm not buying it.” (Senior leader, primary, academy)

“We had to think ‘does it serve a dual purpose, can it be ported online, can it be used face-to-face’, we had to look a lot more in-depth about whether it would work both ways.” (Senior leader, special school)

- Quality of product reflected through having a positive impact on (1) learner engagement and outcomes, (2) reduction in teacher workload, (3) being compatible with existing products, and (4) enhancing existing approaches.

“Does it have a positive impact on the children, yes or no, and does it help [staff] to do their jobs? It has to be user-friendly and does it have an impact on the children's learning, does it make it more interactive, does it make it more accessible.” (Senior leader, special school)

Effective practice

Our research identified a range of factors that can be considered effective practice for making decisions about EdTech.

Speaking to other schools

Most of the schools interviewed felt it was highly beneficial to speak with other schools and colleagues to understand more about their views and experiences with other EdTech products.

This allowed them to ask specific questions from neutral individuals to help them understand the benefits of the product, implications for implementation and any context-related queries they might have.

Trials and product comparisons

The literature review and expert and school interviews all found that that it is useful for schools to run trials of EdTech products to ensure they choose products that help meet their digital objectives and to understand how teachers, administrators, pupils and parents or carers use EdTech tools in practice.

“The head is always quite open. If you found something that's really good, a system, she's always open to looking into it and asking everybody else making a decision together to buy it or not. She'll probably have the ultimate decision. But if we were the ones that are using it, she wouldn't really buy into anything unless we give it a good trial. And then we can see it working. And then she'll buy into it.”
(Middle leader, primary, academy)

“If it's, for example, a times table [EdTech solution] I will assess them before and afterwards, to get a clearer picture if it has or hasn't made an impact. And ask, how do they feel about it? And are they improving?” (Middle leader, primary, Local Authority maintained)

Our interviews with schools found that these trials can be relatively small scale, such as reviewing a free test and exploring it further, or larger in scale, such as accessing different competing trial products and using these in different schools or classroom contexts.

A small number of schools also noted the importance of negotiating short term or trial contracts when initially purchasing an EdTech option, as this meant that if a product was not effective or had any unanticipated negative impacts, they would be able to replace it relatively quickly. They felt that the likely higher cost of a shorter contract was balanced by the risk of being locked into a product they did not value or that was creating challenges.

One school also noted that it had invested considerable time meeting with different EdTech providers as part of the procurement process, getting them to visit the school, building a relationship with them and then negotiating a good deal. This relationship also included the school giving its eventual provider feedback to support ongoing quality assurance. Overall, this approach meant that it was very satisfied with the systems and hardware it had purchased.

Rationalisation activities

As schools increase the number of EdTech products they use, there is a risk that different parts of the school will have disjointed EdTech activity. Teachers within a school may value the same EdTech products differently. Some of these differences can be due to differences in instructional style or teachers' digital capabilities. Individual instructors may favour particular products that do not deliver the highest value to the school as a whole. School leadership must be able to weigh these priorities and manage the procurement process in order to deliver the most value from the available resources. This involves making informed decisions about discontinuing existing providers when adding new providers.

Several of the schools interviewed noted that they had recently been through a process of EdTech rationalisation, where they had reviewed the products and subscriptions they had, spoke with staff and learners about the benefits of these, and made decisions about which to keep and which to discontinue. Schools were quite wary of the potential for duplication both in cost and in workload, and worried that the different options could create confusion for teachers and learners.

Pen portrait: Rationalising the EdTech they have

A senior decision maker at a MAT explained that rather than looking to purchase more EdTech in the next 2 years, they would work to unify and be more consistent across the trust in the use of and approach to EdTech.

The decision maker had joined the organisation in the last year but had the impression that there had been a lot of panic buying at the start of the pandemic. To be able to deliver remote learning quickly, schools across the trust had bought different software, some of which had been used better than others.

“We're doing a reconciliation at the moment where we're trying to figure out if what they've got will be required going forward with no Covid... It is literally a whole new mapping game to figure out. Because it is quite costly to have programmes and things that people don't actually use.”

The trust is now rationalising its EdTech, taking stock of what it has in place, what is being used well and what is not being used much or at all. On this basis it will decide what to keep paying for and what to let go.

“Relating back to the head of department and saying, ‘We notice this maths software hasn't been used for six months. Is it something you need going forward?’ Because a lot of these things will just keep rolling on otherwise.”

(Senior decision maker, secondary, multi-academy trust)

Future support for choosing products

Interviews with schools highlighted that in many cases they felt they could be better informed of the products available on the EdTech market and, particularly, better informed about their respective benefits. Some schools also felt they could refine their decision-making and purchasing approach further. Our interviews and literature review identified a range of areas where schools would benefit from further support when choosing EdTech products.

Comparison options from trusted sources

Schools can find it challenging to identify and compare different products due to lack of time and access to evaluation evidence. They can also find it challenging to compare specific prices, as providers have complex pricing models and sometimes do not publish their prices until the school has engaged in an initial meeting. This means that some staff cannot immediately rule out products that are too costly for their budgets.

There is also a lack of transparent information about interoperability and some respondents noted instances where they had expected systems to link, but this had not worked as expected. The sector also lacks a set of standards for data privacy which can lead to variability across offerings.

Individual schools and companies have limited resources to develop, aggregate and assess evidence. Some experts emphasised that the main barrier to schools making evidence-based decisions was that much evidence that was collected was not shared publicly. Others emphasised that schools lacked a set of centralised recommendations to simplify their procurement processes.

Several of the schools interviewed highlighted that they would like to see the introduction of an online service or website which enabled them to compare similar products and better understand the benefits they might offer to their school and the implications for implementation.

Schools typically felt that the DfE would be the most trusted source to deliver and maintain a service of this nature, due to its neutral position in the market.

Access to evaluations and implementation examples

Schools often do not feel they have the time to review detailed evaluation evidence or are not able to access it. Schools are increasingly looking for robust, trustworthy and accessible evidence of product effectiveness. However, the information available about potential products varies substantially by product and can be difficult to compare.

There are currently limitations in the evaluation evidence for EdTech products in England, and this is an important gap in the market (Clark-Wilson and others, 2021). Schools interviewed felt they did not have sufficient time to review detailed evaluation evidence anyway.

“You might be able to find certain bits, but then you've got to dig harder, so I think, especially if it's an expensive piece of software that you're buying, or equipment, I think it'd be really helpful to have some links into it. It's quite important for schools to communicate, and for trusts to communicate, with each other.” (Senior leader, secondary, academy)

Several of the schools interviewed also noted that they preferred to see more specific examples and case studies of how different products had been used in other similar schools and might benefit their own context. Much of the available evaluation evidence is from US studies, and there is a lack of information about whether these interventions would perform similarly in an England context.

In addition, a particular product might work better or worse in different schools, due to differences in teacher styles and pupil and parent characteristics (EdTech Evidence Exchange, 2021). In areas with low educational outcomes, EdTech decisions should take account, in particular, of diagnostic and remedial challenges. EdTech can provide products that are tailored to the needs of individual pupils, and this approach can be more cost effective than one-on-one tutoring. It can also be challenging for schools to identify best-in-class solutions for SEND students (Department for Education, 2019).

Schools felt it would be beneficial for EdTech providers and the DfE to share accessible summaries of independent research studies (to remove potential provider bias) and specific case study examples of how different approaches might be used.

A few respondents also emphasised the importance of including contact details for different schools which could share their experiences. One school suggested that providers consider using a buddy system to match schools with existing user-schools to provide informal support both at the decision-making and implementation stages.

Streamlining decision making and creating best practice examples for budget requests and proposals in schools

The literature review and our interviews with schools found that MATs can create challenges for procurement decisions due to the larger number of individuals involved (eg they might include trust executives, the trust director of education and school improvement initiatives). Time-consuming decision-making processes can be a barrier to timely uptake and effective scaling, and streamlining procurement decisions by pooling vetting procedures could help schools to onboard and switch between products more effectively (Wright, 2021).

For some schools, a more independent EdTech selection process can be expensive and more challenging, with EdTech companies focusing marketing on larger schools and trusts for cost-efficiency purposes. Joint selection processes across schools and through bundled products could reduce these costs, both in terms of the school resources required and the price offered to schools.

A small number of schools also noted that further internal improvements could be made through the standardisation of EdTech budget requests and business plans. They felt that EdTech providers or the DfE might be able to provide examples and templates that could be used by the different staff members making initial requests. This could help to reduce the duration of the procurement process as it would ensure that school staff were clear about what was needed of them when making their proposals.

Communication on new products and future visioning

A small number of schools highlighted that EdTech is a developing landscape and new innovations are emerging every day. They felt it would be useful for providers and the DfE to share updates to schools on potential future uses of EdTech and their likely timescales, to help them better plan for their future strategies.

EdTech implementation in schools

This chapter explores how schools implement EdTech and the resources and support needed to perform effectively. The chapter is based on findings from the in-depth interviews with school staff and is supplemented with information from the sector experts as well as from the literature review.

Approaches used for implementation

The qualitative interviews with schools revealed a range of different implementation approaches, both in terms of how an EdTech change was initially communicated to staff and how staff were supported in the process.

A new EdTech approach was initially communicated to staff usually in one or more of the following 3 ways: (1) staff meetings (either school wide or department level meetings), (2) INSET days, or (3) emails. Less significant changes were usually announced by email.

Training

When changes were substantial or school wide, some of the interviewed schools provided dedicated time for staff to train during a staff meeting or INSET day. For example, some schools received training after new smartboards were purchased for each classroom or when new school management and administration software was introduced.

Training was usually provided in house, either by the head or an IT/department lead. In a small number of cases, schools reported that prior to the pandemic, an initial announcement of new EdTech had been followed by training from external trainers (eg the software provider). After this, staff who were most confident in the new EdTech would become the point of contact for questions and support.

Effective practice in implementation

Several areas emerged from the interviews with schools as effective practice in implementation. Echoing the findings from the literature review, some staff highlighted that – when implemented well – EdTech could save teachers considerable time. But it also took staff time to learn to use new EdTech confidently. Some staff were resistant to changes regarding its increased use. In light of this, we identified the following factors as being important for effective implementation of EdTech:

- communicating with staff about reasons for EdTech changes

- listening to staff
- providing dedicated time for EdTech training
- taking a supportive and flexible approach
- providing regular updates and training new staff
- making use of external provision
- providing peer support
- ensuring accessibility for parents and carers

Communicating with staff about reasons for EdTech changes

EdTech changes, especially major ones, require good engagement from teachers working at all levels in the school. To this end, some of the schools interviewed said that it was important to communicate to teaching staff why changes were being made and the associated benefits, including (1) increasing savings in staff time (eg in gathering data, writing reports, conducting assessments and marking work), (2) improving pupil engagement and progression, and (3) meeting particular needs (eg those of SEND children).

Informing staff about the reasons for EdTech changes usually resulted in less resistance. Staff varied in their preferences for using EdTech due to their skills and experience, but when they understood its benefits, implementation was often easier and more effective.

Pen portrait: Engaging staff, minimising disruption

The head of a secondary academy highlighted the importance of getting staff on board with changes to EdTech. Communication about why changes were being made and the benefits of changes were key. Otherwise, staff would not understand why they were being asked to do things differently and might not welcome the changes.

Under the head's strategic direction, the school had made substantial EdTech changes over the last 5 years. This had included implementing a new school management platform, moving from servers to a cloud-based system and introducing new devices for students and staff. However, the head believed that EdTech changes should not be made unless necessary – and it was crucial that changes were made in a well-thought-out, coherent order. The head was keen to avoid staff and students having to deal with learning a constantly changing array of EdTech systems and tools.

(Senior decision maker, secondary, academy case study)

Listening to staff

Some staff interviewed mentioned that they would welcome the opportunity to provide more feedback to senior leaders about what worked well for them. There were also requests for senior leaders to listen to the concerns of teachers and – where appropriate – to use the EdTech implementation process to address them. There were a few examples of this in practice, but some teachers and middle leaders felt that this kind of communication was currently lacking in their schools.

Pen portrait: Consulting staff about EdTech implementation

A middle leader at a primary school reported that most of its EdTech was implemented across the whole school and so training was done at that level. Prior to the pandemic, the head had sometimes arranged for external providers to deliver EdTech training sessions to staff. Examples included training on using interactive whiteboards when they were introduced and on a specific software they used. This had been done after consulting staff about what they would like and what they would find most helpful.

“She'd asked us, before she got the trainers in. What do you think would be useful? And we all came to an agreement with that one of the staff meetings would be used as a training session.”

Prior to the pandemic, EdTech had been used in around 50% of lessons at this school. It was now being used in almost every lesson even if only for a few minutes. They were trying to use EdTech in an integrated way across the whole curriculum.

(Middle leader, primary, academy)

Providing dedicated time for EdTech training

Interview respondents working at all levels in schools reported that it was difficult to fit training in among many other competing priorities. Schools which made dedicated time for EdTech training sessions usually had senior leaders who viewed EdTech as a strategic priority. Staff in these schools usually appreciated the training opportunities and found them useful.

Some schools provided dedicated training sessions in their staff meetings and INSET days. They reported that staff having the opportunity to have some hands-on time with the new EdTech and a chance to explore the new technology and ask questions made training particularly useful.

Taking a supportive and flexible approach

Several schools interviewed highlighted the importance of a supportive and flexible implementation approach, as staff had different ways of learning. Many staff members appreciated having formal training, but some also wanted to spend a little more time understanding how new EdTech worked before using it in the classroom.

Pen portrait: Flexible, top-down and bottom-up methods

A secondary academy uses a range of different implementation approaches depending on the level at which new EdTech is being introduced, and takes account of different learning styles:

- **Top down:** Providing staff with a quick briefing and the opportunity to learn more in small bookable sessions works well, as does encouraging heads of department to champion EdTech for their subject.
- **Bottom up:** At a department level, training is very informal and they all have a test run with the new EdTech which they have agreed to introduce and help each other as and when needed.
- **Sessions on request:** The IT learning lead runs sessions to help teachers who are less confident in using particular aspects of technology.
- **Involving students:** The school appoints 2 digital champions each year (both students) who have substantial responsibility for day-to-day EdTech set-up, maintenance and troubleshooting across the whole school. This frees up staff time and provides valuable experience for the students. The digital champions have a website for student requests for support and they write guidelines for students when new software is introduced.
- **EdTech newsletter:** At present the IT lead is setting up a monthly newsletter to flag up new EdTech developments at the school.

(Middle leader, secondary, academy case study)

Pen portrait: A flexible, supportive approach

The business manager at a MAT found it important to provide a range of ways to implement new EdTech solutions, as people have different preferred methods of learning. The manager also liaises with the EdTech platform provider for additional support, when required.

“Some people like doing things themselves, and then they will happily research. But some people need a bit more guidance. So it's just knowing that and having some sort of customer support from that platform provider... We're all there to help each other.... I think that is hugely important, working as a team, rather than an individual.”

(Senior decision maker, secondary, academy)

Providing regular updates and training new staff

Several schools said that following initial implementation of some new EdTech, it was important to provide regular updates. These can serve the purpose of checking in with staff to see how they are using it in their teaching and learning activities and whether they need any more support. It was also important to train new staff when they join the school.

Pen portrait: Training for new staff and regular updates for all

A secondary academy had purchased a learning platform, but found it was not well used initially. It had recruited a middle leader to support all staff to use it in an effective, consistent way.

Training is now offered to all new staff to use the platform, so that they know how to use it and understand the benefits of doing so. Regular training updates are provided for all staff as well as bespoke training sessions in response to specific queries. Feedback is gathered from staff about how the system – and the training – can be improved.

(Middle leader, secondary, academy)

Making use of external provision

A number of schools had accessed external training to help them implement new EdTech solutions, particularly when they were introducing and rolling out major new software. For example:

- Local authority support. A senior decision maker at a primary school said that key staff attended regular EdTech training sessions delivered by their local authority and then disseminated what they learned to their colleagues. There was also a local authority technology support department which could answer ad hoc queries.
- Support from other schools. A special education school had received support (it thought this was via DfE) to buddy up with staff from other schools to share knowledge. One of the other schools interviewed had been providing EdTech support to other schools through the DfE's EdTech Demonstrator programme.
- Training from EdTech providers. Several schools had accessed training from the EdTech providers after purchasing new software.
- Online CPD. A few schools reported that during lockdown staff had started to access short online external CPD, some of which was on EdTech implementation. One school had set specific EdTech CPD targets for staff.

Providing peer support

Many schools used peer support as an adjunct to more formal training. Where little or no formal training was provided, peer support was key in helping staff to learn how to use EdTech. During lockdown there had been an increase in collaboration and sharing of experience and good practice between teachers within schools.

Ensuring accessibility for parents and carers

Schools reported that parents and carers had engaged with EdTech for communicating with the schools and assisting their children. This depended on a range of factors including their access to devices, their comfort with EdTech implementation and whether English was their first language.

Challenges for the market in implementation

Teachers vary substantially in their readiness for, understanding of and engagement with digital learning (Economist Intelligence Unit, 2021). Experts noted that digital leaders in schools tended to be younger teachers. However, senior buy-in for digital learning at a school is key to effective implementation (Petko and others, 2018). Strong collaboration

between teachers can support effective delivery, while staff attitudes and lack of technical training can create barriers.

Schools need infrastructure, technical support, technical staff and other resources to support teachers to deliver effective classes with EdTech products. During the COVID-19 pandemic, these issues presented obstacles to effective remote learning (Singh and others, 2021).

Careful consideration is required to use adaptive learning platforms in a way that is aligned with curricular values (Hillman and others, 2020). Additionally, trends in cheating via essay mills also need to be monitored (Department for Education, 2019).

Variable staff confidence in using EdTech

The interviews with schools revealed a wide range of staff confidence in using EdTech and enthusiasm to embrace it in teaching and learning beyond the constraints of the pandemic. Therefore, a key challenge is ensuring that all staff are confident to use EdTech effectively.

As with the experts interviewed, some staff members noted that, in general, younger teachers were naturally more comfortable using EdTech and therefore more likely to embrace it and continue to use EdTech in the absence of any strategic direction. Under similar circumstances, older teachers who had not grown up with an abundance of technology were often keen to return to older practices.

However, training can help overcome this. For example, a secondary school with a clear EdTech strategy said that giving sufficient encouragement and training meant that teachers of all ages and prior experience had become comfortable using EdTech, appreciated its benefits and wanted to continue using it.

Pen portrait: New EdTech still presents challenges for some staff

A middle leader at a secondary school reported that the implementation of tablets and new touchscreen TVs had had mixed results. On the whole, they had worked better for students than for teachers, simply due to some staff's lack of familiarity and confidence using new EdTech. No training at the point of rollout meant that staff had not had the opportunity to become confident in using the new EdTech to its fullest extent.

“The tablets are able to mirror onto the screen. But most [teachers] still use their laptops, because they're not entirely confident with doing that.”

“Generally, the younger members of staff are very happy to use the new technology and the older members of staff struggle with it, just because they're not as familiar with it.”

(Middle leader, secondary, academy)

Devices and infrastructure

EdTech devices need to be well maintained and sufficiently up to date to support effective use of EdTech by staff and students. Interviews revealed considerable variability in the quality and number of devices in schools. Some schools gave a new tablet to every student, while others had a limited number of laptops, which were rather old. Limited access to technology at home reportedly widens inequalities between students when EdTech is implemented.

Infrastructure and connectivity issues also present challenges. The lack of high speed internet in rural locations hinders schools implementing EdTech effectively. For example, a primary academy reported that limited internet access meant they could not have full classrooms working online. They were aware that government initiatives can support rural communities and would like to see this expand to include all schools. In areas with good internet infrastructure, not all homes were equipped due to the cost of internet connection, creating inequalities for pupils and for parents and carers if EdTech was the prime method of school-parent communication.

Time constraints, competing priorities

Many of the school staff interviewed acknowledged the difficulty of finding time for EdTech training due to a wide range of competing priorities, such as focusing on basic literacy and numeracy. However, without sufficient training, EdTech solutions may not be used effectively.

Future requirements and support

Experts noted that there were limited training or expert resources currently available to teachers in England, particularly regarding EdTech selection and implementation. This could be a helpful area for future development.

The interviews with schools also highlighted this point as an area for future attention, with requests for training from providers and support from other schools. Some staff called for EdTech to be prioritised by their senior leaders at their schools and for DfE to underpin this by providing strategic direction.

More training from EdTech providers

Experts interviewed believed that EdTech providers could support teacher capabilities by having an ongoing relationship with the school and providing support and feedback. The experts felt that teachers particularly valued customer support and being able to contact the provider if they encountered problems when using a product.

Some school staff interviewed would welcome more training from providers on their EdTech solutions, particularly before or at the early implementation stage. Being able to try the product out and ask questions would help to make best use of training time.

Support from other schools

A few schools said they would welcome support from other schools whose EdTech was more advanced. One of the schools interviewed had been doing this for the last 2 years as part of DfE's EdTech Demonstrator programme and, despite the programme being due to end, they were keen to continue to help other schools as much as they could.

“That's why I'm hoping the programme continues. It's about trying to save money for schools, which you can do easily and considerably. It also makes it more efficient and more effective in how it runs for all the users involved... That usually means the teacher, the students, the parents, and the saving for staff is reducing their workload.” (Senior decision maker, secondary, academy case study)

Pen portrait: Support from other schools would be welcomed

A teacher at a secondary academy would like to see their school become an EdTech flagship. As head of a MAT, the teacher thought it should be leading the way but lack of money, buy-in and prioritisation from leaders, plus having staff who were quite resistant to change were considerable barriers. The teacher would welcome help from other schools that were further established with EdTech.

“I think, pooling ideas, sharing ideas... I'd love to see one of those types who comes in with vision, and can motivate us all and really sell it to us, because there is going to be resistance from older, more establishment staff. But just to do a CPD day just focused on Tech would be brilliant.”

The teacher thought that more communication from DfE about what other schools were doing and more encouragement for schools to share good practice and learn from each other would be very helpful. The teacher wondered whether schools could get together for CPD days on EdTech and thought that DfE might also need to introduce some minimum benchmarks in EdTech for schools to prioritise this sufficiently.

(Teacher, secondary, academy)

Prioritisation of EdTech by school senior leaders

Some staff working as middle leaders or teachers in schools would like to see their SLT give greater strategic prioritisation to EdTech in their school. In practice this could include:

- more consultation and better communication on EdTech in the school
- greater priority given to providing ongoing EdTech training for all staff, including teaching assistants
- more external specialists being involved in staff CPD, particularly to help less confident staff to embed EdTech in their teaching and learning practice
- increased skilled EdTech capacity among core staff to support future rollouts – some schools might need to recruit staff to meet future needs

More strategic direction from DfE

Many of those interviewed thought that DfE should do more to provide strategic direction for schools regarding their use of EdTech. This was seen as particularly beneficial among teachers and middle leaders in schools where senior leaders were still more cautious

about EdTech, as this may encourage them to embrace using it in a more uniform and effective way.

Pen portrait from an ‘EdTech cautious’ school: DfE should prioritise EdTech use in all schools

A teacher at a primary school said that their school was highly resistant to change and resources were limited. Increased use of EdTech was actively discouraged by the SLT. The hardware and software implemented during the pandemic to enable remote teaching was no longer in use. The teacher thought that DfE needed to drive schools forward regarding EdTech, otherwise schools such as this would fall further and further behind, as would the children. The teacher hoped that the DfE would:

“Change the curriculum. Because it's not good enough for the current world that we're living in. And I think that there needs to be stricter guidelines on using technology in schools... it needs to be pushed a lot more than it is.”

Schools which were more strategic and experienced in their use of EdTech agreed that DfE should lead the way with a digital strategy for schools. They would find it helpful if EdTech was embedded across the whole curriculum, so that all schools could benefit from its implementation and equip their students to use it throughout their lives.

Suggestions for the shape of the strategic direction schools would like to see included:

- encouraging schools to prioritise EdTech integration to equip children for the future
- highlighting the benefits of EdTech to and for schools, eg programmes that can be used to reduce teachers' workload and benefit teaching and learning
- providing schools with guidance and support to ensure they get the best value from technology
- providing ringfenced funding for EdTech in schools
- ensuring equality and fairness in access to EdTech for all schools, including access to suitable infrastructure and connectivity

Conclusions

This study combined a range of sources of evidence to summarise the current EdTech market in England. We identified the following common themes that our web crawl and school interview evidence jointly highlighted. (For a full summary of findings, please refer to the executive summary).

Available solutions and gaps in the market

There is a large offering for independent learning and revision. Around 40% of EdTech companies provide resources for parents and pupils and employ almost 25% of the EdTech workforce. This is consistent with schools reporting a wide range of products used in different curriculum areas both for synchronous and asynchronous learning, as well as for homework and independent study

Identifying companies that offer EdTech for SEND learners was challenging, and schools also reported barriers to effectively supporting SEND learners with EdTech, although there are pockets of effective practice.

There is substantial crossover activity between the market segments that our analysis identified

We estimate that 44% of EdTech companies are active in more than one segment and 13% in more than two. Large companies are more likely to operate in more than one segment. This creates challenges in creating or using taxonomies of products and services to guide buying decisions or in choosing products and services to meet a specific objective when a range of types of products are potential candidates.

Our interviews also suggest that some schools prefer to use products in class that pupils can use at home or that are easily transferable if remote learning is necessary. It is difficult to distinguish between resources for parents and pupils (for use outside of the classroom) and other segments (for use in the classroom), as these products and services can be used in different settings.

We found that large companies are over-represented in the EdTech market

Ninety-three percent of identified EdTech suppliers are classified as SMEs and 7% are large companies (compared to less than 1% in the UK as a whole). We found a higher proportion of large companies among (1) suppliers of class aid and educator support, and (2) hardware and devices. This is consistent with the schools interviewed reporting usage of products from large companies.

Choosing EdTech products and services

Providers reported challenges in selling EdTech products and services in the England market. It is more profitable for providers to focus on selling to large scale EdTech buyers and therefore, within England, providers may tend to focus attention on large schools or MATs. Providers may also tend to focus on international markets where purchasing decisions are conducted at a higher administrative level than the individual school.

Information on EdTech products is decentralised (eg word of mouth, provider websites), and products can have different pricing structures that are difficult to compare. This can increase search costs for schools, which creates inertia and barriers to innovation. Many schools felt they could be better informed about the EdTech products and services available as well as their benefits. Others thought they could further refine and improve their decision-making process.

Schools place great emphasis on word-of-mouth feedback and examples of good practice. Most favour speaking to another school or individual teacher (in their own networks or a case study representative) over other forms of information. This can create clusters of schools using particular products and services and may create barriers to identifying the most suitable solution.

Schools also reported using online search engines and provider websites to help choose EdTech products. We found that a range of terminology can be used on websites to describe types of EdTech products, and this can create barriers to comprehensive searches.

Areas where schools would benefit from further support when choosing EdTech products include:

- having a trusted online service or website to compare options
- improving access to evaluations and implementation examples
- identifying ways to streamline decision making and create best practice examples for budget requests and proposals in schools
- improving communications about potentially beneficial future products.

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Technical annex 1: list of keywords

Keywords search displayed in parts:

Keyword	Category	Market segment
adaptive technology	Technologies	All
AR	Technologies	All
artificial intelligence	Technologies	All
digital twins	Technologies	All
ed tech	General market	All
EdTech	General market	All
ed-tech	General market	All
EdTech software	Products and services	All
EdTech solution	Products and services	All
education tech	General market	All
education technology	General market	All
educational tech	General market	All
educational technology	General market	All
edutech	General market	All
online platform	Products and services	All
virtual reality	Technologies	All
class aid	Applications	Class aid or educator support
classroom management	Applications	Class aid or educator support
collaborative learning	Applications	Class aid or educator support
distributed learning	Applications	Class aid or educator support
educator support	Applications	Class aid or educator support

Keyword	Category	Market segment
multi-modal instruction	Applications	Class aid or educator support
pedagogical support	Applications	Class aid or educator support
remote teaching	Applications	Class aid or educator support
simulated learning	Applications	Class aid or educator support
teacher support	Applications	Class aid or educator support
teaching aid	Applications	Class aid or educator support
transcription	Applications	Class aid or educator support
tutor support	Applications	Class aid or educator support
learning paths optimisation	Outcomes	Class aid or educator support
teacher workload	Outcomes	Class aid or educator support
teaching efficiency	Outcomes	Class aid or educator support
teaching productivity	Outcomes	Class aid or educator support
anti-cheating software	Products and services	Class aid or educator support
computer adaptive test	Products and services	Class aid or educator support
computer managed instruction	Products and services	Class aid or educator support
computer-aided assessment	Products and services	Class aid or educator support
computer-aided instruction	Products and services	Class aid or educator support

Keyword	Category	Market segment
computer-aided instruction (CAI)	Products and services	Class aid or educator support
computer-assisted instruction	Products and services	Class aid or educator support
computer-assisted teaching	Products and services	Class aid or educator support
computer-based instruction	Products and services	Class aid or educator support
computer-based instruction (CBI)	Products and services	Class aid or educator support
computer-based training	Products and services	Class aid or educator support
computer-based training (CBT)	Products and services	Class aid or educator support
course management applications	Products and services	Class aid or educator support
curriculum resources	Products and services	Digital learning product or content
digital curriculum	Products and services	Class aid or educator support
e-assessment	Products and services	Class aid or educator support
internet-based training	Products and services	Class aid or educator support
internet-based training (IBT)	Products and services	Class aid or educator support
literacy software	Products and services	Digital learning product or content
LMS	Products and services	Class aid or educator support
marking solutions	Products and services	Class aid or educator support
online CPD	Products and services	Class aid or educator support

Keyword	Category	Market segment
student information system	Products and services	School management
virtual learning environments	Products and services	Class aid or educator support
virtual learning environments (VLE)	Products and services	Class aid or educator support
web-based training	Products and services	Class aid or educator support
web-based training (WBT)	Products and services	Class aid or educator support
adaptive learning technology	Technologies	Class aid or educator support
assistive technology	Technologies	Class aid or educator support
course delivery technology	Technologies	Class aid or educator support
instructional technology	Technologies	Class aid or educator support
multimedia learning	Technologies	Digital learning product or content
teaching technologies	Technologies	Class aid or educator support
teaching technology	Technologies	Class aid or educator support
technology-enhanced learning	Technologies	Class aid or educator support
technology-enhanced learning (TEL)	Technologies	Class aid or educator support
multi-user virtual environments	Products and services	Class aid or educator support
multi-user virtual environments (MUVES)	Products and services	Class aid or educator support
online timetable	Products and services	Class aid or educator support

Keyword	Category	Market segment
pupil software	Products and services	School management
teaching software	Technologies	Class aid or educator support
applications	Products and services	Digital learning product or content
book platform	Products and services	Digital learning product or content
classroom 2.0	Products and services	Digital learning product or content
content videos	Products and services	Digital learning product or content
digital courses	Products and services	Digital learning product or content
digital educational resources	Products and services	Digital learning product or content
educational content	Products and services	Digital learning product or content
educational game	Products and services	Digital learning product or content
educational media	Products and services	Digital learning product or content
etextbooks	Products and services	Digital learning product or content
homework platform	Products and services	Digital learning product or content
learning applications	Products and services	Digital learning product or content
learning apps	Products and services	Digital learning product or content
learning games	Products and services	Digital learning product or content
lesson resources	Products and services	Digital learning product or content

Keyword	Category	Market segment
live book	Products and services	Digital learning product or content
massive open online courses	Products and services	Digital learning product or content
MOOC	Products and services	Digital learning product or content
OER	Products and services	Digital learning product or content
online content	Products and services	Digital learning product or content
online courses	Products and services	Digital learning product or content
open educational resources	Products and services	Digital learning product or content
virtual reality courses	Products and services	Digital learning product or content
virtual reality integrated courses	Products and services	Digital learning product or content
virtual reality integrated courses (VRIC)	Products and services	Digital learning product or content
application development	Technologies	Digital learning product or content
assistive devices	Products and services	Hardware and devices
interactive display	Products and services	Hardware and devices
interactive equipment	Products and services	Hardware and devices
audio visual	Technologies	Hardware and devices
augmented reality	Technologies	Hardware and devices
augmented virtuality	Technologies	Hardware and devices
AV	Technologies	Hardware and devices
robotics	Technologies	Hardware and devices

Keyword	Category	Market segment
VR	Technologies	Hardware and devices
VR/AR	Technologies	Hardware and devices
adaptive learning	Applications	Resources for parents or pupils
blended learning	Applications	Resources for parents or pupils
cyber-learning	Applications	Resources for parents or pupils
digital education	Applications	Resources for parents or pupils
digital learning	Applications	Resources for parents or pupils
digital literacy	Applications	Resources for parents or pupils
distance learning	Applications	Resources for parents or pupils
elearning	Applications	Resources for parents or pupils
e-learning	Applications	Resources for parents or pupils
exam prep	Applications	Resources for parents or pupils
GCSE learning	Applications	Resources for parents or pupils
GCSE revision	Applications	Resources for parents or pupils
home learning	Applications	Resources for parents or pupils
IGCSE learning	Applications	Resources for parents or pupils
IGCSE revision	Applications	Resources for parents or pupils
independent learning	Applications	Resources for parents or pupils

Keyword	Category	Market segment
m-learning	Applications	Resources for parents or pupils
mobile learning	Applications	Resources for parents or pupils
multimedia search	Applications	Resources for parents or pupils
networked learning	Applications	Resources for parents or pupils
online education	Applications	Resources for parents or pupils
online learning	Applications	Resources for parents or pupils
online revision	Applications	Resources for parents or pupils
online tutoring	Applications	Resources for parents or pupils
open learning	Applications	Resources for parents or pupils
personalised learning	Applications	Resources for parents or pupils
personalised revision	Applications	Resources for parents or pupils
personalized learning	Applications	Resources for parents or pupils
remote learning	Applications	Resources for parents or pupils
social learning	Applications	Resources for parents or pupils
test prep	Applications	Resources for parents or pupils
ubiquitous learning	Applications	Resources for parents or pupils
video learning	Applications	Resources for parents or pupils

Keyword	Category	Market segment
video-based learning	Applications	Resources for parents or pupils
virtual education	Applications	Resources for parents or pupils
virtual learning	Applications	Resources for parents or pupils
web-based education	Applications	Resources for parents or pupils
parental engagement	Applications	Resources for parents or pupils
careers guidance	Products and services	Resources for parents or pupils
learning platforms	Products and services	Resources for parents or pupils
learning software	Products and services	Resources for parents or pupils
live lesson	Products and services	Resources for parents or pupils
mobile-assisted language learning	Products and services	Resources for parents or pupils
mobile-assisted language learning (MALL)	Products and services	Resources for parents or pupils
online class	Products and services	Resources for parents or pupils
online school	Products and services	Resources for parents or pupils
personal learning environments	Products and services	Resources for parents or pupils
virtual class	Products and services	Resources for parents or pupils
virtual classroom	Products and services	Resources for parents or pupils
virtual school	Products and services	Resources for parents or pupils

Keyword	Category	Market segment
web-learning platform	Products and services	Resources for parents or pupils
learning analytics	Technologies	Resources for parents or pupils
learning technology	Technologies	Resources for parents or pupils
computer-aided learning	Applications	Resources for parents or pupils
computer-based learning	Applications	Resources for parents or pupils
digital classroom	Products and services	Resources for parents or pupils
digital courseware	Products and services	Resources for parents or pupils
digital education platforms	Products and services	Resources for parents or pupils
learning workshop	Products and services	Resources for parents or pupils
aptitude testing	Applications	School management
automated administration	Applications	School management
campus management	Applications	School management
curriculum planning	Applications	School management
essay marking	Applications	School management
formative assessment	Applications	School management
ground management	Applications	School management
lesson planning	Applications	School management
marking homework	Applications	School management
marking workload	Applications	School management
performance management	Applications	School management
plagiarism detection	Applications	School management
pupil progress tracking	Applications	School management
scheduling	Applications	School management

Keyword	Category	Market segment
school administration	Applications	School management
school management	Applications	School management
student assessment	Applications	School management
timetabling	Applications	School management
visitor management	Applications	School management
authoring tools	Products and services	School management
computer-mediated communication	Products and services	School management
computer-mediated communication (CMC)	Products and services	School management
etest	Applications	School management
e-test	Applications	School management
information sharing platform	Products and services	School management
intelligent tutoring systems	Products and services	School management
intelligent tutoring systems (ITSs)	Products and services	School management
learning content management system	Products and services	School management
learning content management system (LCMS)	Products and services	School management
learning management system	Products and services	School management
learning management system (LMS)	Products and services	School management
LMS solution	Products and services	School management
management information system	Products and services	School management
training management system	Products and services	School management

Keyword	Category	Market segment
advance visualisation	Technologies	School management
data analytics	Technologies	School management
data exchange	Technologies	School management
data insights	Technologies	School management
data integration	Technologies	School management
data sharing	Technologies	School management
edge computing	Technologies	School management
information exchange	Technologies	School management
information sharing	Technologies	School management
SEND teaching	Applications	SEND resources
SEND devices	Products and services	SEND resources
SEND digital resources	Products and services	SEND resources
SEND resources	Products and services	SEND resources
badging/credentialing	Applications	Services
education recruitment	Applications	Services
online safeguarding	Applications	Services
safeguarding assessment	Applications	Services
school IT management	Applications	Services
school IT support	Applications	Services
school payments	Applications	Services
cyber security	Products and services	Services
digital signage platform	Products and services	Services
safeguarding consultancy	Products and services	Services
safeguarding training	Products and services	Services

Keyword	Category	Market segment
strategic consultancy	Products and services	Services
technical advisory services	Products and services	Services
cloud integration	Technologies	Services
cloud platform	Technologies	Services
cloud storage	Technologies	Services

Technical annex 2: market sizing estimation

Employment calculation

Our data includes information on employment for 68% of companies. Allocating all 1.7 million employees in large companies to the EdTech market would be to grossly over-estimate the size of the market. Therefore, we generated 3 estimates with varying assumptions on the proportion of large firms' employment that is part of the EdTech market. We generated the 3 estimates as follows:

- **high estimate:** 20% adjustment for large companies – the result is 49,000 employees
- **medium estimate:** 15% adjustment for large companies – the result is 41,000 employees
- **low estimate:** 10% of employees in large companies – the result is 32,000 employees.

Our estimates include both full-time and part-time employees. In our analysis on the characteristics and composition of total EdTech employment, we took a conservative approach by using the middle range.

GVA calculation

Gross value added (GVA) measures the contribution to the economy of the amount of goods and services that have been produced minus the cost of all inputs and raw materials used for their production. It is used in the estimation of the gross domestic product (GDP) – $GDP = GVA + \text{taxes} + \text{subsidies on products}$.

As we do not have GVA data at the company level, we made an estimate by multiplying the number of EdTech workers by an appropriate benchmark for GVA. We used 2 such benchmarks in order to get an adequate range:

- For the top end of the range, we assumed that all EdTech employees generate the same GVA per worker as the average in the digital sector (as defined by the Department for Digital, Culture, Media & Sport). According to the latest data available, this is £99,000.³²
- For the bottom end of the range, we assumed instead that:

³² [DCMS sectors economic estimates](#).

- EdTech employees in digital sector companies generate £99,000 per worker
- EdTech employees working for other companies (eg utilities, healthcare, transport) generate the same GVA per worker as the average in non-digital sectors. That is £56,000 according to the latest data available.³³

Overall, we estimated that the GVA generated in a year by the 41,000 EdTech employees in England is between £3.7 billion and £4.0 billion.

³³ [DCMS sectors economic estimates](#).



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edtech.team@education.gov.uk or www.gov.uk/contact-dfe

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