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# EdTech: The Decentralisation Of The Learning Economy

Written by  
Nikolas Krawinkel and Yann Decroos



## Introduction

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While the Internet and other technologies have greatly impacted many industries, education remains relatively unchanged. Despite the rapid advancement of technology, the way we learn, teach, and deliver education has stayed largely the same for decades, if not centuries. **Yet the global market for education and training continues to expand and is expected to reach \$7.3 trillion by 2025.**

Even with the growing need for education and skill development, **only 3.6% of total spending in education is allocated to digital learning (Holon IQ, Citi bank).** This is remarkable given that more than half of the time spent learning is done digitally. It is also clear that the education sector must adapt to keep up with the changing requirements of the global workforce. The need for skill development is increasing at an unprecedented rate, with businesses having to continuously invest in their workforce in order to remain competitive, adapt to change and retain the best talent.

Change is now afoot with digital spend on education expected to at least double in the next 5 years. Importantly, there are clear indications that education is now moving from its historical, centralized framework to a highly fragmented and multi-layered system where most learning occurs beyond the boundaries of traditional institutions – the implications of which are profound.

This report will explore the rise of EdTech not only in an academic context but also in the workplace learning and development market. It will also identify new ways of learning and highlight the most interesting opportunities emerging in the sector.

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***“Traditional learning institutions simply cannot, and will not, evolve fast enough to keep pace with the rapidly changing needs, perceptions and behaviours of the future workforce.”***

—Nikolas Krawinkel, Partner at Mangrove Capital Partners

*Authors: Yann Decroos and Nikolas Krawinkel*

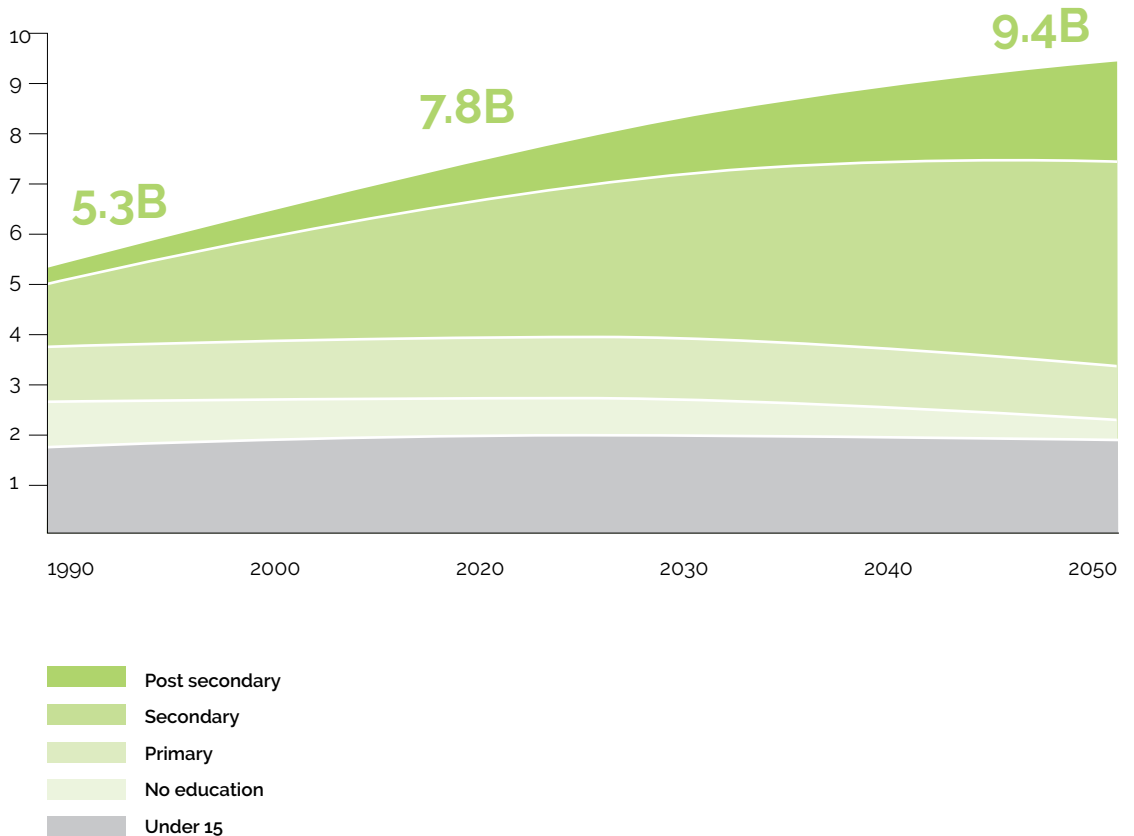
## Learners on the rise

The number of worldwide learners is increasing steadily with an additional 350 million post-secondary graduates and nearly 800 million more pre-secondary graduates expected in the next decade. Indeed by 2050 there will be a staggering 2 billion additional learners across the globe.

To keep up with this growth, the world would need to add 1.5 million teachers

per year on average, approaching a total of 100 million in the coming years (up from 80 million today). These basic macro and demographic trends make two things evident: 1) there will always be a critical mass of people who want and need to continue their educational journey 2) scalable tech is needed in order to complement the shortage of human teaching supply that the world is facing.

**Global population by highest level of education attainment.**  
Billions of people (1990 – 2050 F)



## Lifelong learning

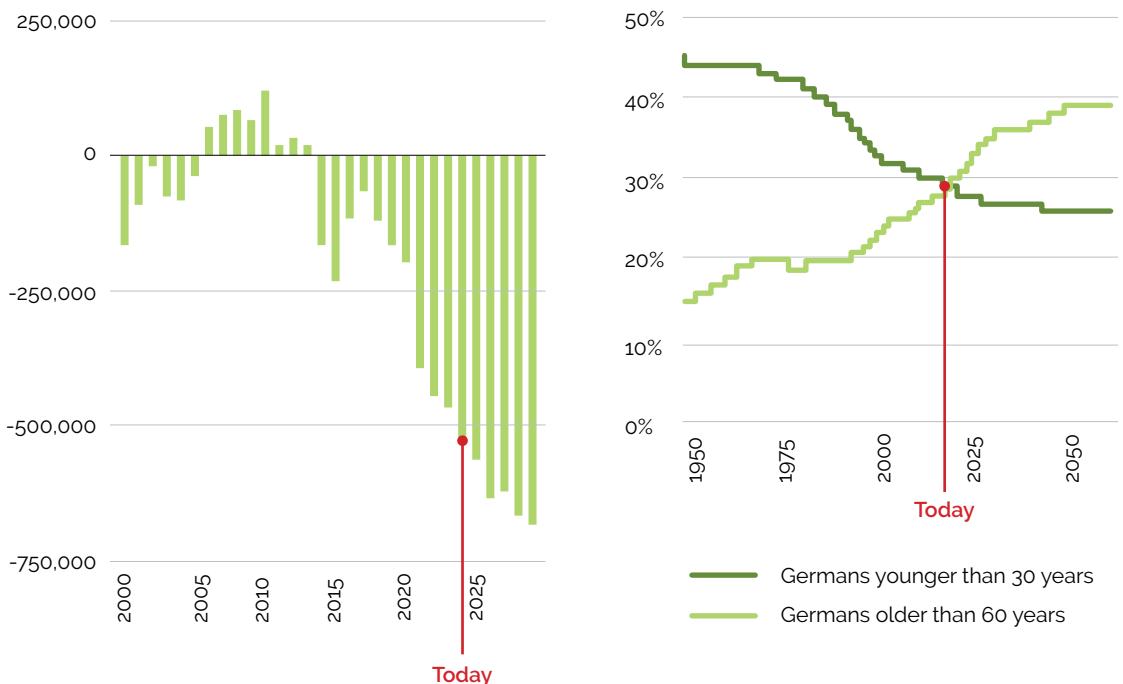
There are many trends that underline the growing importance of lifelong learning in today's economy. For instance, **the average tenure of a job is now only 4.5 years, and today's workers will likely have 10 to 15 different jobs in their lifetime** (Deloitte). This is especially true for younger generations – employees aged under 34 change jobs most frequently with an average job duration of 2.8 years for employees aged 25 to 34 in January 2022, versus 4.7 years for those aged 35 to 44 (US Bureau of Labour Statistics). This means that throughout life, there is a constant need to re- and upskill in order to remain competitive in the job market.

Furthermore, the European population is ageing, with over 30% of the population currently already over the age of 55 (Eurostat). This profound change in demographics is having a considerable impact on the workforce – Germany alone is losing over 500k workers annually and there are now more Germans older than 60 than younger than 30.

The result is a significant loss of experienced workers from the workforce, but also an increased retirement age. In Germany, for example, the proportion of people of retirement age continuing to work doubled in the past 10 years (Destatis). The ageing workforce will need to continuously learn new skills for an even longer period of time in the future. It is also likely that retirees will increasingly seek to learn new skills in order to supplement their pension with an additional income. Indeed, 28% of pensioners in Germany had a monthly net income of under €1 thousand in 2021 (Destatis).

Finally, **it is estimated that 65% of students who pass the baccalaureate today will have a job that does not yet exist** (World Economic Forum). These trends all highlight the growing need for education and training programs, addressing all age groups, in order to continuously prepare workers for the rapidly changing job market.

### Shifting demographics in Germany



## Attitudes have changed

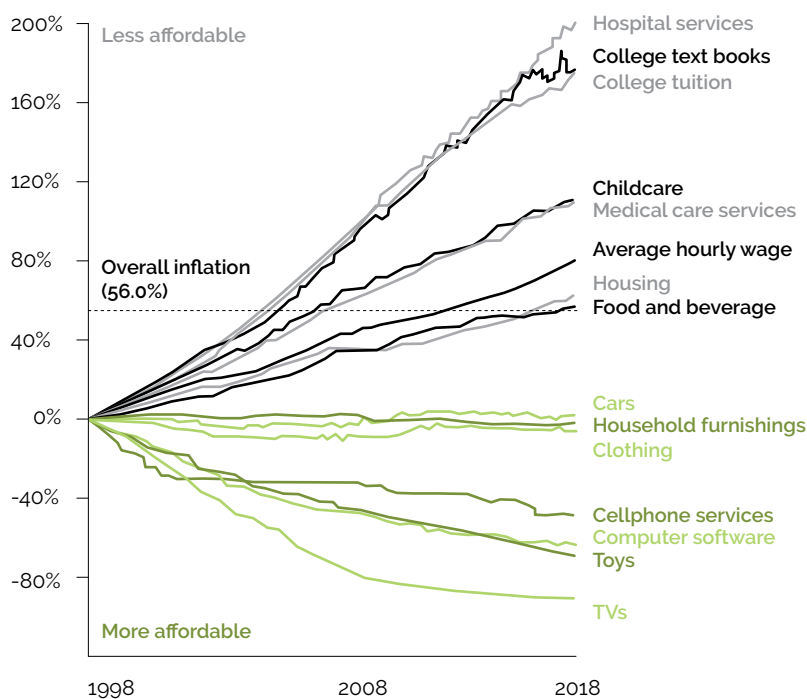
Today, only **51% of Gen Zs want to pursue a 4-year college degree, down from 71% just two years ago**. Furthermore, 56% believe that a skill-based education makes more sense (ECMC Group). This shift in attitudes is being driven by the fact that companies like Tesla and Apple no longer require college degrees for many of their jobs. Additionally, most universities are not offering degrees that equip young adults with the skills they need to succeed in the real world. This is particularly concerning given that students are taking on significant levels of debt to finance their education, with the cost of tuition fees in the US and UK rising dramatically over the last two decades. Apart from hospital services, education is the sector where consumers in the US have faced the steepest price increases over the past 20 years.

The dramatically rising costs of tuition fees and textbooks leave significant room for innovation. These costs are especially alarming given that many traditional universities still struggle to turn a profit. In the US and the UK, 25% of universities ran in deficit in 2018-19 (Moody's).

Ginni Rometty, former chair, president and CEO of IBM, coined the term "New Collar" to define a new category of roles in some of the technology industry's faster growing fields that do not always require a traditional degree. Typical new-collar jobs include cloud computing technicians, database managers, cybersecurity analysts and user interface designers. Clearly there is a need for digital, scalable university alternatives to provide students with the skills they need to succeed in the modern economy.

### Price changes (January 1998 – December 2018)

Selected US consumer goods, and services, wages



## Explosion of non-traditional channels

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The ways that people learn are now evolving rapidly, driven by changing consumer expectations and new technologies. Learning online has become increasingly popular and Covid-19 has proved that it works. In recent years, **the number of learners reached by massive open online courses (MOOCs) has expanded greatly, from 300k in 2011 to 220 million in 2021** (Edsurge). Additionally, the number of hybrid and distance-only students at traditional universities has grown by 36% between 2012 and 2019, with the Covid-19 pandemic contributing to an additional 92% increase in this growth (McKinsey).

At the same time, smartphone penetration globally has reached almost 70%, enabling on-the-go learning. Interestingly, researchers found that **70% of learners are more motivated to learn when they use mobile devices**. Microlearning, which involves breaking down complex topics into smaller, bite-sized pieces, has also proven to be an effective way of delivering education and training. According to RPS Research, "microlearning improves focus and supports long-term retention by up to 80%". Gamification, which refers to the use of game-like elements in education and training, is also becoming increasingly popular. Scientific studies have shown that it can have positive effects on the learner's engagement and motivation, academic achievement and social connectivity

(Science Direct). Examples of new models and channels of learning include Historical Figures, which uses advanced AI technology to allow students to have conversations with over 20,000 historical figures from the past.

Social media platforms are also commonly being used to facilitate learning. Previously the belief was that students want to learn from accredited teachers. Now many passion economy platforms, where creators can share and monetize their passion with niche communities, are forming around a more controversial, yet compelling, ethos: Anyone can be a teacher. **"How-to" videos are what bring 51% of all US-based YouTube users to the site** (Pew Research Centre) and according to the company's own statistics, nine in 10 users worldwide perceive its platform as a "place to learn". For instance, the Youtube channel FreeCodeCamp has over 7m subscribers and offers both coding and Excel educational videos. Indeed some highly successful Edtech companies began as simple Youtube channels – The Simple Club, for example, initially focused on STEM videos but has since raised VC money and built their own learning platform for students. Meanwhile in China, TikTok plans to show more educational content – from science experiments to museum exhibitions – in response to a government push to limit app addiction, particularly among kids.

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—Yann Decroos, Investor at Mangrove Capital Partners

### Explosion of non-traditional channels (continued)

Especially for the Gen Z generation, social media platforms have become popular, non-traditional channels for learning efforts. One example would be the hashtag #LearnOnTikTok, which currently has more than 17.6 billion views. Another example is mobile app Revyze, which aims to build the TikTok of educational videos. It targets high school students and was created in response to feedback from students who would rather learn from their peers than their teachers. Indeed platforms like TikTok have grown to a size where they are ripe to be unbundled for verticals such as education in order to help users find the relevant content they want.

Meanwhile new technologies, such as virtual and augmented reality (AR/VR), have the potential to create more immersive and interactive learning experiences. Studies have shown that VR can create a 75% learning retention rate compared to 10% for reading and 5% for lectures (National Training Laboratory). VR has already been used in flight attendant training, resulting in massive cost savings for airlines by not having to keep planes on the ground. AR and VR may finally find its mainstream breakthrough in corporate learning.

### The most popular educational channels on YouTube

By number of subscribers

1	National Geographic	21.1M
2	Kurzgesagt – In a Nutshell	19.9M
3	TED-Ed	18.1M
4	Vsauce	15.1M
5	Vox	11M
6	SmarterEveryDay	10.8M
7	CrashCourse	10.1M
8	AsapSCIENCE	8.9M
9	Veritasium	6.6M
10	SciShow	6M
11	CGP Grey	5.8M
12	minutephysics	5.6M
13	TheBackyardScientist	5.5M
14	Khan Academy	5.3M
15	Seeker	5.1M
16	NASA	5M
17	Big Think	5M
18	NileRed	4.8M
19	HISTORY	4.7M
20	Nat Geo WILD	4.5M

## Increasing investor attention

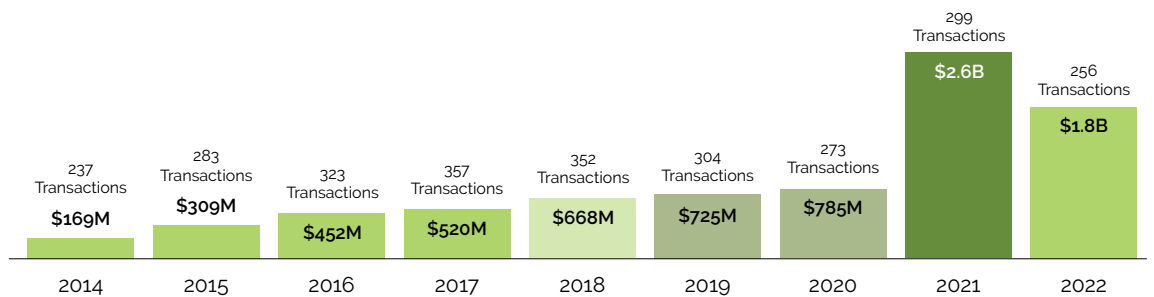
These irreversible trends all point to a sector that is set to experience profound change over the next decade. Indeed, venture capitalists (VCs) invested \$20.8 billion in the Edtech sector globally in 2021 – more than a 40x increase on the amount invested in 2010 (Holon IQ) – underlining the rapid growth of the industry and its increasing attractiveness among investors.

Globally, there was Edtech venture capital investment of \$10.6B of investment (Holon IQ). Notable mega rounds in 2022 included a \$340M Series D raise by

Austria's GoStudent, a \$220M Series D by UK's Multiverse and a \$220M Series D by Germany's CoachHub. Although Edtech was certainly boosted by Covid, we are confident that it will remain a very relevant investment target for many VCs.

France is flourishing as the country with the most Edtech companies in Europe according to the European Edtech Alliance which mapped 1233 companies across 36 different countries. In close second comes Spain, followed by the Netherlands, Germany and the UK.

### Edtech VC funding in Europe 2014-2022



Source: Brighteye



## K12 digital content opportunities

**The world needs to add 1.5 million teachers per year on average**, approaching 100 million in total in the coming years.

This is unrealistic and presents a massive opportunity for software solutions to fill this shortage. As a result, tech spending is on the rise and institutions are now including instruction and digital assessment tools into their teaching approach. The K12 digital instruction market is poised to grow from \$26B today to \$42B in 2025 (CAGR of 17%).

Solutions targeting K12 STEM education have the potential to become billion dollar companies, if they are able to get integrated into the school curriculum. This ensures almost daily touchpoints resulting in high engagement levels and likely higher lifetime values (LTVs). This means that they would have a combined B2B and B2G approach selling directly to schools or school districts.

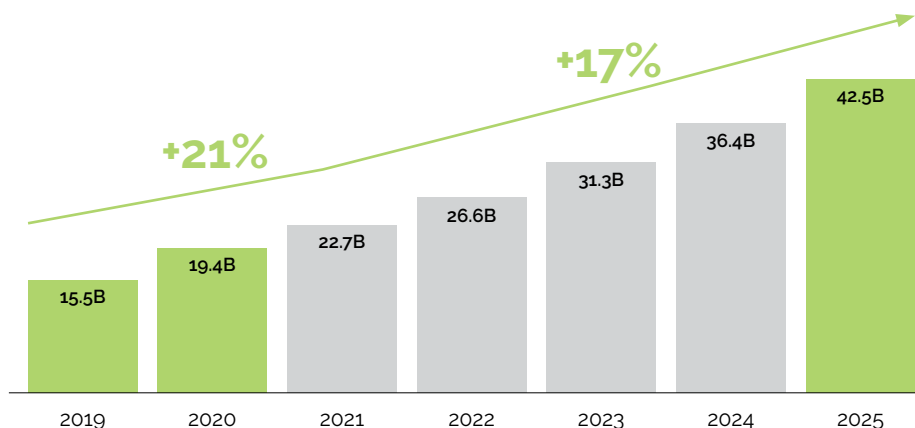
The need is urgent: The National Assessment of Education Progress (NAEP) report for the 2020–2022 period revealed the largest drop in maths and reading scores since the 1980s. Platforms such as Innovamat aim to change this trend by revolutionising the learning of mathematics for K12 children using digital methods including gamification, entertainment and adaptive learning. They support both children and teachers and follow the official school curriculum. Technology in STEM subjects also offers the possibility of adaptive learning by focusing on individual strengths and weaknesses.

Given the obvious importance of STEM education among children in our data driven world, this space likely represents a very significant opportunity. Schools won't be able to solve these challenge on their own.

The difficulty in this space is the myriad of stakeholders with potentially conflicting objectives, all of which need to be addressed. Institutions fund the product; educators implement it; students use it; and parents potentially assess its effectiveness based on achieved grades. Adding to this all the various differences at a country level, only a handful of European players may be successful. It is difficult to know what exactly those players will look like, and innovation might have to come not only from a tech perspective but also from a business or sales model point of view, given that selling to schools is extremely challenging. However, there is an opportunity for a disruptive founder to rethink the entire system and change K12 education forever.

The picture is less complex for B2C Edtech; however, it is difficult to see what sort of value proposition would result in a high willingness to pay from the consumer directly, given most consumers of education have historically received it for free. While the B2C model is utilized by the tutoring and app market, many of these companies also incorporate a B2B offering.

### K12 Digital instruction assessment outlook USD Billions

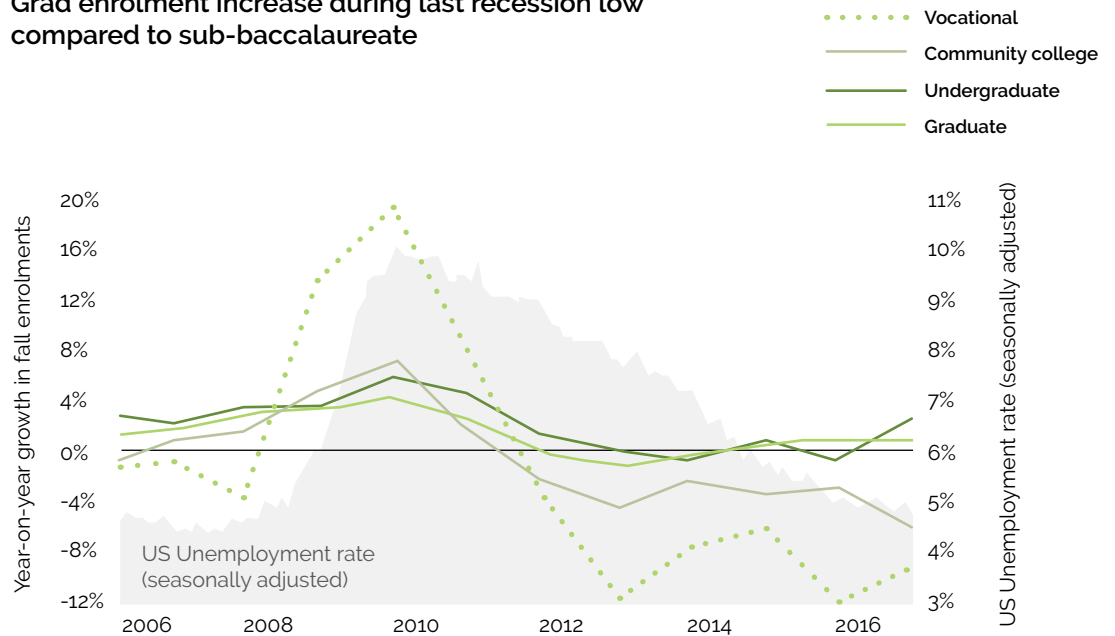


## Alternative universities

The emergence of university alternatives is a response to the changing needs of the modern labour market. Successful startups in the space are focused on providing students with the skills they need to succeed, rather than offering a broad range of academic subjects. They offer a high-quality user experience and flexibility, which traditional universities often struggle to provide. Mangrove is bullish on the startups in this space that manage to develop close partnerships with organizations looking to upskill their employee base and attract new talent. Given the current macro-economic environment, it is worth taking a look at which types of college enrolments are most popular during times of crisis.

As can be seen from the graph, vocational courses see a massive 20%+ increase in enrolment during periods of high unemployment, compared to a low ~3% for traditional undergraduate and graduate degrees. Startups focused on providing vocational training using the latest Edtech resources have the potential to be highly successful. Furthermore, taking a vertical approach and focusing on a specific job role or industry may turn out to be a long-lasting competitive advantage. For example, training and developing blue-collar workers for the green economy presents a fascinating opportunity. In this space, there exists a massive skills gap as the world will need an additional 60 million more green workers by 2030 (McKinsey), of which 90% will be manual workers.

**Grad enrolment increase during last recession low compared to sub-baccalaureate**



**Percentage point growth rate in enrolment during high unemployment**

Graduate	Undergraduate	Community college	Vocational
<b>+2.3%</b>	<b>+3.6%</b>	<b>+6.9%</b>	<b>+20.2%</b>

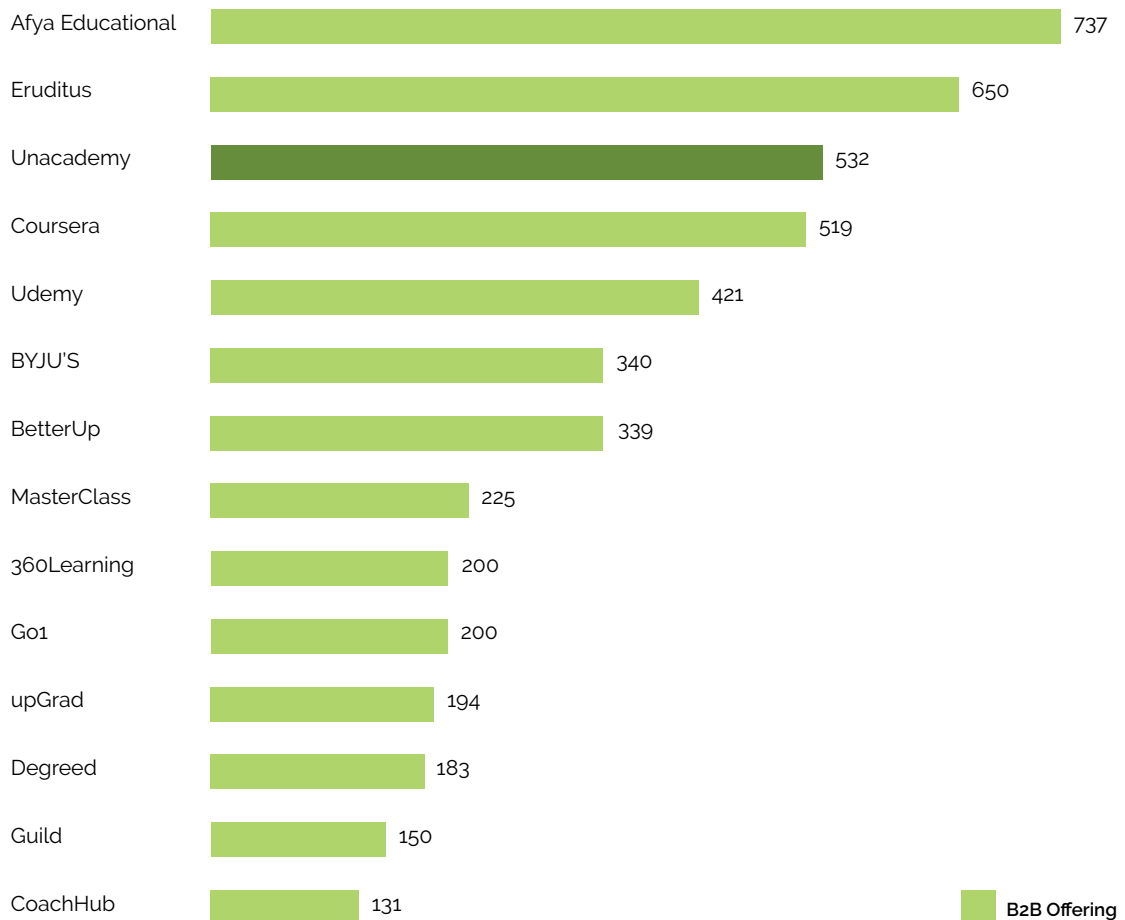
Source: EAB

## Employee up- and reskilling: A necessity for large firms

Employers are increasingly recognizing that it is crucial to offer up- and reskilling opportunities to their employees. Reasons for this are not only increased employee attraction and retention, but also the constant need to remain competitive by teaching the latest necessary skills staff must master in order to use different technologies. As a firm we are especially interested in startups catering to enterprises,

as these clients have the necessary resources to invest in such platforms. This also seems to be a common trait among successful Edtech companies. In the graph below we can see that for the 15 adult-education companies that received the most funding in 2021, all but one have an enterprise offering (Dealroom/McKinsey).

### Largest global adult edtech funding deals in 2021 \$ Million



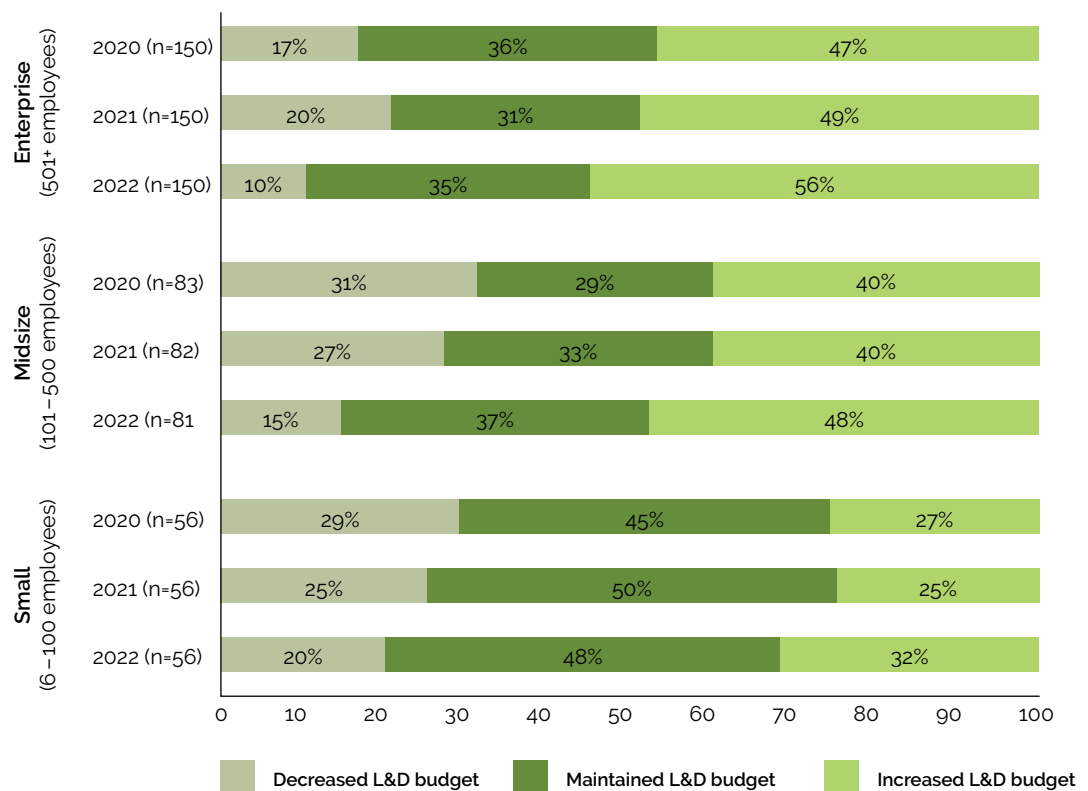
**Employee up- and reskilling: A necessity for large firms (continued)**

Year over year, large enterprises have consistently increased their employee learning and development budgets. This budget has now reached almost \$1300 per year per employee (Statista). Companies are spending serious money to continue developing their workforce and there are no signs of this slowing down. In 2022, 56% of large enterprises (500+ employees) planned to continue increasing this budget while only 10% planned on decreasing it (Capterra), with the remainder keeping spending levels intact.

These platforms will continue to thrive in a post-Covid world, particularly those platforms focusing on upskilling. This is due to the faster time-to-value and lower investment both in terms of time and money, compared to complete reskilling for which the ROI is often unclear.

Additionally, startups offering career pathways can help employees gain educational credentials, skills, apprenticeships and new jobs. Recently, companies like Amazon and Walmart have reduced the requirement for a traditional four-year degree. Instead, the companies have created non-linear programs to fill talent gaps. Great examples are Guild Education in the US or Lynx Educate in Europe. These platforms, which are used by the likes of Disney and Chipotle, provide a range of certified education offerings from learning institutions to meet workforce development needs. Startups that partner up with traditional learning institutions will be well placed to offer compelling learning content to corporates.

**Learning and development budgets according to company size**



Source: Capterra

### Employee up- and reskilling: A necessity for large firms (continued)

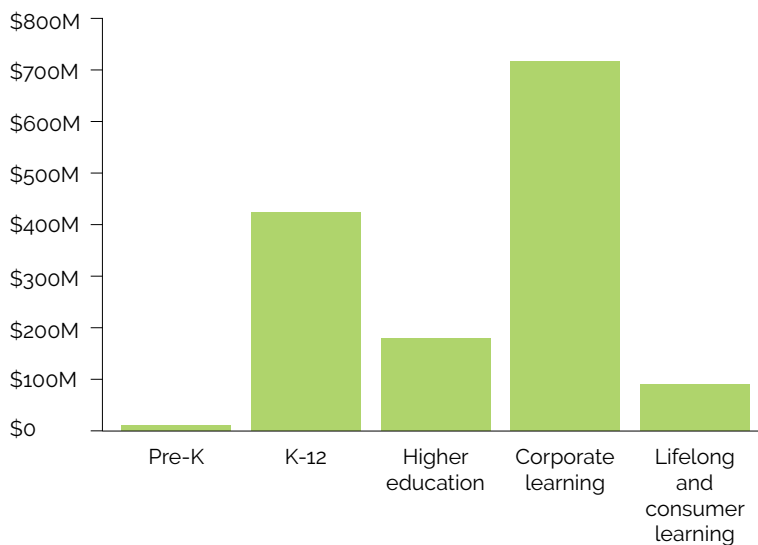
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Startups in this space are also now emerging that capitalise on new content delivery channels. Examples include 5Mins which has been described as TikTok for workplace learning and incorporates gamification, social features and "intelligent personalization". The company is aiming to level the playing field for employee learning and development, giving SMBs and mid-market companies the best possible toolkit to unlock their teams' potential.

The market for corporate learning is already estimated to be worth a massive \$360 billion, however new-generation companies – where tech innovation is part of the core value – are yet to be built. Given that 79% of organizations are pursuing initiatives to address skill gaps in the labour market, it is likely only a matter of time for such category defining companies to emerge. It is also noteworthy that corporate learning attracts the most VC funding (Brighteye VC).

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### Global VC investment in edtech companies by stage in H1 2022



## Conclusion

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The rise of the learning economy, an economic system which encourages people to continuously invest in their education and skills development, represents a fascinating opportunity for entrepreneurs and investors. With the needs, perceptions and expectations of learners now changing, barriers to entry are falling and new models and channels for teaching are rapidly proliferating.

The world is also facing an unprecedented challenge in up- and reskilling entire workforces, driving a vast enterprise market as companies allocate significant budget to address the issue. With neither traditional learning institutions nor existing in-house learning seminars in a position to have a significant impact, the opportunity is wide open for startups.

Mangrove is committing significant funds to education technologies and is interested in entrepreneurs that have a deep understanding of the new ways of learning, teaching and content delivery. As a firm we are paying particular attention to businesses that are catering to corporates which face urgent up- and reskilling needs.

We are actively seeking early stage Edtech startups operating in the following fields:

1. Vertical solutions: Focusing on single industries or job roles
2. Corporate education: Upskilling platforms targeting enterprise clients
3. AR and VR platforms for corporate training
4. Startups changing the way we learn via social media, micro learning or gamification
5. Alternative universities that address existing skill gaps and partner with the industry
6. Startups directly targeting blue collar workers
7. Startups sitting at the intersection of Edtech and Silver Tech

## Written by Nikolas Krawinkel and Yann Decroos

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**Yann Decroos** is an investment associate at Mangrove Capital Partners. Prior to joining Mangrove, he worked at a high growth tech startup called Talkwalker, which is a social listening platform, advising clients on their online strategies. He holds a Master of Science in Corporate Finance and a Bachelor (Hons) in Management from London City University (Cass Business School) in London.

## About Mangrove Capital Partners

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Mangrove Capital Partners ([www.mangrove.vc](http://www.mangrove.vc)) is Europe's leading early stage venture capital firm. It works with top entrepreneurial talent at the earliest stages of innovation, with the aim of being the first institutional investor: the firm has

co- created projects and regularly injects funds prior to product launch, often in unproven, unusual or unfavoured technologies. Mangrove manages more than \$1 billion in assets and is headquartered in Luxembourg with offices in Berlin and Tel Aviv.



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