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EdTech innovation in China's educational market – lessons Poland should learn from.

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Table of Contents

Introduction	5
1. EdTech background	7
1.1. Description of the Educational Technology	7
1.2. EdTech product landscape	7
1.3. Global EdTech market	10
1.4. Global investment opportunities and trends	11
1.5. Education giants and biggest EdTech startups	16
1.5.1. Largest publicly listed education companies	16
1.5.2. Largest EdTech startups	18
2. EdTech innovation in China's education market	20
2.1. Market data	20
2.1.1. China's education market	20
2.1.2. China's online education market	21
2.1.3. China's AI online education market	23
2.1.4. Market drivers	24
2.2. Consumers	25
2.3. Investments	29
2.3.1. Venture Capital investment data	29
2.3.2. Education investment trends	33
2.4. The Ecosystem and know-how	35
2.4.1. EdTech hubs in China	35
2.4.2. Biggest companies and their know-how	38
2.5. Government support	39
2.6. Innovation in China's EdTech	40
2.6.1. Innovative emerging players	42

2.6.2. Innovative established players	48
2.7. Risks and uncertainties of China’s EdTech	51
3. EdTech investors	55
3.1. Who is investing in EdTech?	55
3.2. Asian investors in the US EdTech market	57
3.3. China’s EdTech exits	59
4. Lessons learned for Poland	61
4.1. Research method description	61
4.2. The state of Polish EdTech sector	62
4.3. Takeaways from best practice and some suggestions for improvement.....	65
4.3.1. Propositions on how to solve problems in Polish EdTech.....	65
4.3.2. World’s best practices used in Polish EdTech companies.....	67
4.3.3. Advices for beginner entrepreneurs	68
4.4. Polish-Chinese Cooperation.....	71
Conclusions	74
List of tables.....	88
List of figures	89
Attachment 1	90
Abstract.....	95

Introduction

In the last 40 years, China has gone through an incredible transformation and development of its economy. With the growth rate of over 10% per year throughout those years, it became the second largest economy in 2010, when it got ahead of Japan (Ambasada Rzeczypospolitej Polskiej w Pekinie, 2017). Experts estimate that it might become the largest economy in the world by 2030 and Jim O’Neill, the chief economist in Goldman Sachs, suggested that it might happen even a few years earlier (Gazeta Wyborcza, 2010). In the meantime, there have been many businesses that grew together with the economy development. One of the highest-growth areas was education, which saw the rise of the two largest education companies in the world and both Chinese. The development of Internet technologies allowed for disruption of this sector and creating business models that have never been possible before. Currently, we can observe a massive wave of young Chinese education companies, which are called Educational Technology (EdTech) companies, that are using modern technologies to offer new value proposition to consumers and grow at a fast pace.

Are Chinese EdTech businesses innovative? What is innovative about them? Is the Chinese ecosystem supporting the growth of the EdTech offerings? How Poland can boost its EdTech sector by learning from China’s example? In this work, a hypothesis of China as the creator of an innovative Educational Technology businesses will be verified. If it turns out to be true, the analysis will be used to conclude lessons, that the Poland’s EdTech should learn from to improve the competitiveness of its startups to become global players.

Nelson Mandela once said, “Education is the most powerful weapon which you can use to change the world” (Duncan, 2013). It is certain that education plays the key role in shaping the future of the nation and its economy. Unfortunately, Polish education sector isn’t doing well, and the recent events of teachers strike in April 2019 are the proof of it (Santora & Berendt, 2019). Moreover, there is no Polish university in the first 300 spots of the Academic Ranking of World Universities, which even better describes the present-day (ShanghaiRanking Consultancy, 2019). In comparison, Chinese universities made a spectacular jump from spots in third hundred in 2004 to the two of them rank in the first 60 spots in 2019, with Tsinghua University taking 43rd and Peking University 53rd place. Currently, the development is impossible without the use of newest technology that support education and promote a different type of learning that adapts us to the requirements of present job market. According to the

survey conducted by the School of Professional & Graduate Studies at Mid America Nazarene University, “73% of teachers agreed that technology had dramatically changed the classroom in the last five years. (...) 56% of their tools have become tech based—such as smart boards, student portals, laptops, tablets, learning software, and learning apps (a far cry from the worksheets and pencils of yesteryear). These tools have not only brought the classroom into the modern age, but they have also enhanced learning and teaching, according to 82% of the teachers surveyed” (MidAmerica Nazarene University, 2019).

The topic of Educational Technology is particularly interesting because of its rapid development and its potential impact. Educational Technology is often times called “the new FinTech”, which is supposed to describe the growth of this industry and the fact that it will completely reshape the way we learn (Bainbridge, 2016). According to Tech Crunch, “Fintech is a factor of the fourth industrial revolution that has completely taken the world by storm and forever revolutionized how we bank.” The area of education is entering a phase of radical change brought by the digital transformation, just like entertainment and financial sectors in the past decades. Investments in EdTech are expected to reach USD 250 billion in 2020 from below USD 10 billion in 2016 (EdTech Hub Ventures, 2019).

In the next chapters, the education global market data will be analyzed to capture the current state of Educational Technology development. Later on, the focus will be shifted to China and the available data will be analyzed to answer the research questions and find innovative Chinese EdTech businesses. Then, a closer look will be given to investors active in the EdTech space. At the end, the current state of Polish EdTech sector will be described and lessons that Poland should learn from to drive its growth will be concluded.

1. EdTech background

1.1. Description of the Educational Technology

The official definition of “educational technology”, according to the Association for Education Communications and Technology, is “the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources” (UNESCO, 2014). A bit simpler definition provided by Cambridge Advanced Learner’s Dictionary & Thesaurus states that it is “the use of technology in education, or the design of such technology” (Cambridge Dictionary, 2019). Overall, this term, also known as “EdTech”, refers to the technology that aims to develop and implement tools, such as software, hardware, and processes, which will make education more efficient and accessible (promote education) (Lazaro, 2014). In this case, the technology is used to enhance pedagogy, not to supplant or replace it (EdTech Review, 2013).

In the most simplistic words, EdTech are educational solutions that leverage technology to aid the delivery of education (EdTech Review, 2013). Modern solutions link education with newest technologies and enhance learning experience and results by providing the most up to-date education that is accessible anytime and anywhere (Marynowicz, 2017). These solutions open great possibilities for education seekers and students by allowing them global access, inclusion and personalization of learning.

1.2. EdTech product landscape

Many different disruptive technologies are being used to support the education process, make it more accessible, efficient and personalized. To understand the broad and fast-changing scope of EdTech offerings, a general perspective on different product categories is needed. In January 2017, a research agency Meetari (formerly known as Ambient Insight) published “The 2016 Global Learning Technology Investment Patterns” report (Metaari, 2017). The agency itself was founded by the original members of the Advanced Knowledge Engineering team that built the Microsoft Online Learning Institute (MOLI), the world’s first international commercial eLearning business which was launched in 1995 (Metaari, 2019). The authors divided the landscape of EdTech product types into eight categories that are bought by six buyer segments. All of the categories with examples of companies were gathered below in the table 1 (Metaari, 2018).

Table 1. EdTech product categories with examples of companies

Category name	Description	Company example
Self-paced eLearning	Courseware, Massive Open Online Courses (MOOC)	2U (USA), Coursera (USA), Degreed (USA), 17zuoye (China), HuJiang (China) lynda.com (USA) XuetaoX (China)
Collaboration-based Learning	Live online classes and live tutoring	VIPKID (China), 51talk (China), iTutorGroup (China)
Digital Reference-ware	Digital audio, video and eTextbooks	Healthline Media (USA), Descomplica (Brazil), JueSheng.com (China)
Simulation-based Learning	Virtual Reality (VR) and Augmented Reality (AR)	DAQRI (USA), Skill India (India), Apprentice.io (USA), STRIVR (USA)
Game-based Learning	Educational games	Age of Learning (USA), Akili Interactive Labs (USA), ZZish (UK), SAM Labs (UK)
Mobile Learning	Access to educational content through mobile devices	Zuoyebang (China), Zhihu (China), Yuanfudao (China), Liulishuo (China), Duolingo (USA)
Cognitive Learning	Well-being, mental health and productivity products	Total Brain (USA), Thrive Global (USA), Virgin Pulse (USA)
Robotic Tutors	Educational robots	Makeblock (China), Roboterra (USA), Catalia Health (USA)

Source: Own elaboration based on Metaari, *The 2016 Global Learning Technology Investment Patterns*, retrieved August 24, 2019, from http://www.metaari.com/assets/Metaari_s-Analysis-of-the-2016-Global-Learning-Technology-Investment-Pat25875.pdf, and Crunchbase, retrieved August 24, 2019, from <https://www.crunchbase.com>.

Through 2014 and 2015, self-paced eLearning was the most financed category by investors, and we could see the rise of many MOOC platforms (Ambient Insight, 2015). However, that changed in 2016, when Mobile and Game-based Learning were the most invested categories and were followed by Cognitive and Collaboration-based Learning (Metaari, 2018). In the most recent years, these patterns are changing further, and new products are introduced with each next year that change consumers' and investors' preferences.

When it comes to the six buyer segments defined by Metaari, they are Consumer, Corporations (businesses), PreK-12, Higher Education, Federal Government and State-Local Government (Metaari, 2017). Among these, since 2014 consumer and corporation-facing companies are attracting the strongest investment interest (Metaari, 2018).

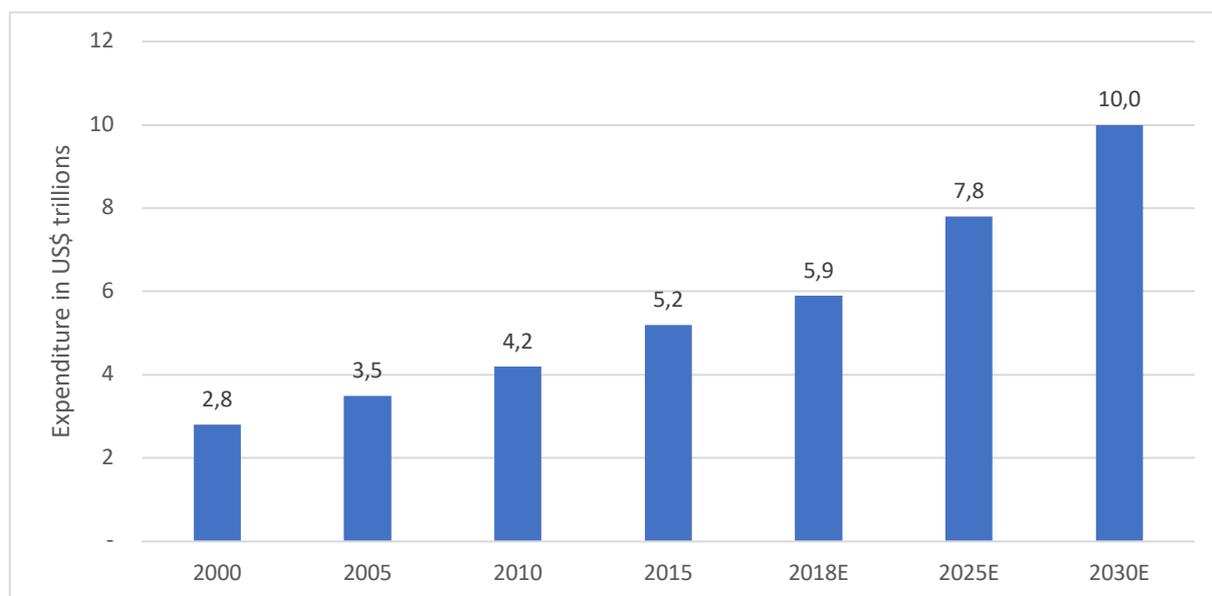
A crucial factor for the development of new products and business models is the state of technology. To understand how the EdTech product landscape might change in the future and which technologies will drive this change, four experts in EdTech from Poland were asked to share their opinion and findings. As key technologies that will change the education offerings of future my interviewees listed Augmented Reality (AR), Artificial Intelligence (AI), mobile technologies and 3D printing. The AI is said to support the education processes especially in terms of personalization of education content and verification of learning progress. When it comes to the business models, free educational resources, freemium and subscription models were mentioned. In addition, as a product and an area with great potential they mentioned Massive Open Online Courses (MOOC) and STEM, which is an acronym for science, technology, engineering, and mathematics, introduced in 2001 by scientific administrators at the U.S. National Science Foundation (NSF) as a field and curriculum centered on these subjects (Hallinen, 2019). Later, in southwest Pennsylvania the definition of STEM was formulated as “an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering, and mathematics in contexts that make connections between school, community, work, and the global enterprise enabling the development of STEM literacy and with it the ability to compete in the new economy” (Hallinen, 2019). STEAM abbreviation adds to the standard STEM formulation an A for arts (Feldman, 2015). Within this space, programming and building robots develops particularly fast. When it comes to MOOCs, we can observe that the early MOOC that were created by universities evolved to either specialized websites, where consumers can buy online courses in narrow discipline, or platforms where everyone can create and add its

own course in a wide range of topics (Wojewodzic, 2018). The last, but not least trend is the development of mobile education together with the growth of mobile usage market share increase.

1.3.Global EdTech market

According to Holon IQ, an agency that provides global intelligence platform for education, the total global expenditure on education in 2018 has almost reached US\$6 trillions and is estimated to reach US\$10 trillions by 2030 (Holon IQ, 2019). It is more than three times the amount in 2000, which was US\$ 2.8 trillion. The historical global education market expenditure size and estimated future predictions might be seen in the figure 1 below.

Figure 1. Global education market expenditure 2000-2030



Source: HolonIQ, retrieved July 30, 2019, from <https://www.holoniq.com/edtech/10-charts-that-explain-the-global-education-technology-market/>.

To put this expenditure amount into perspective, with over US\$ 5 trillion in 2016 it was already eight times the size of the software market and three times the size of the media and entertainment industry, according to a report produced in May 2016 by EdTechXGlobal, a leading education technology-focused conference, in partnership with IBIS Capital (Finance Digest, 2016). The report points out that the EdTech market growth will hugely depend on the global education market, as education is becoming more expensive. While we will see the rise

in spending, the market will be also more demanding when it comes to the education products requirements. According to the Wittgenstein Centre for Demography and Global Human Capital, which is a collaboration center among the International Institute for Applied Systems Analysis, the Austrian Academy of Sciences and the Vienna University of Economics and Business, by just 2025, there will be half a billion more school and university graduates worldwide than in 2018 (Holon IQ, 2019; Wittgenstein Centre, 2019). According to EdTechXGlobal, by 2035, the number of students worldwide is estimated to reach 2.7 billion (Finance Digest, 2016). To make sure that current education systems will meet this demand, two universities a day have to be built through the next twenty years. The population growth will be driven primarily by developing countries, which usually provide a lower level of education than developed economies. These factors create a challenge for current education models, products and services to deliver the same or higher level of education for a much bigger scale (Holon IQ, 2019).

The easiest and most common way of dealing with the scale, quality and time requirements that we use is digitalization. As of today, education as a sector is highly under-digitized. According to EdTechXGlobal, education was only 2% digitized industry (Finance Digest, 2016). Moreover, as of 2019 the digitization hasn't reached 3% yet (Holon IQ, 2019). This creates a great opportunity for EdTech companies to deliver digitized products that will bridge the gap between the future and current global demand and supply. From US\$152 billion spent in 2018 on global EdTech, Holon IQ estimates a significant growth to US\$342 billion by 2025. However, this will not exceed 5% of global expenditure on education overall. According to EdTechXGlobal, the EdTech market by 2020 will already reach US\$ 252 billion (Finance Digest, 2016). This incredible market growth is predicted to will be driven by Artificial Intelligence (AI) and the expenditure on education focused AI is estimated to be a USD 6 billion market in 2025 (PR Newswire, 2019).

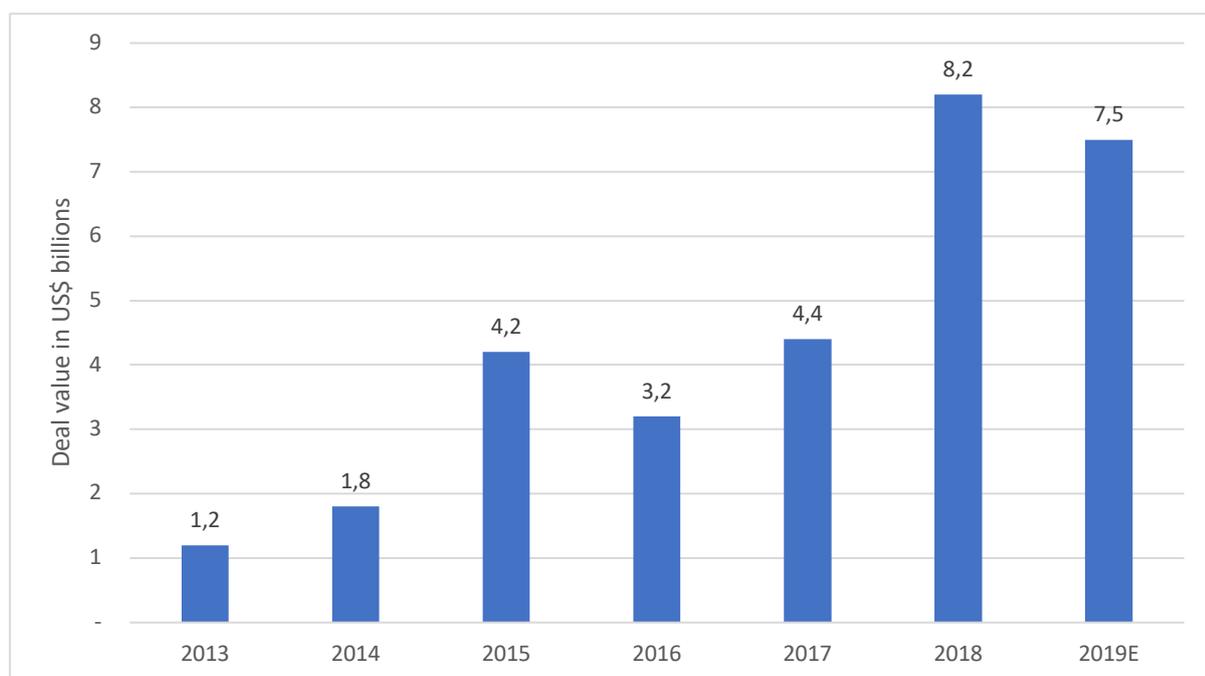
1.4.Global investment opportunities and trends

In comparison to other sectors, education lacks funding (Holon IQ, 2018). From a supply and demand perspective, this is indeed a challenge. There is not enough government and private investment in education to fund the innovation that is needed to face the challenges mentioned in previous chapter. From an investor perspective, this might be a great opportunity to enter an

underinvested sector and make big returns. According to Holon IQ, global education market capitalization in 2018 was just 2,5% of the global education market. To put this into perspective, global healthcare market capitalization is 50% of the global healthcare market, and total global market capitalization is close to 90% of global GDP.

Many has seen this chance, and the VC investment in EdTech is growing since its last peak in 2015. In 2018 the investment in over 1000 education related transactions reached US\$8.2 billion, which was a growth of over 4 times in just last 5 years (Holon IQ, 2019). When it comes to 2019, the first half of the year looks promising. EdTech companies secured US\$3.5 billion of VC funds and the 2019 result in total deal value is predicted to reach US\$7.5 billion, which might be seen in figure 2 below (Holon IQ, 2019).

Figure 2. Global EdTech Venture Capital investment deal value 2013-2019

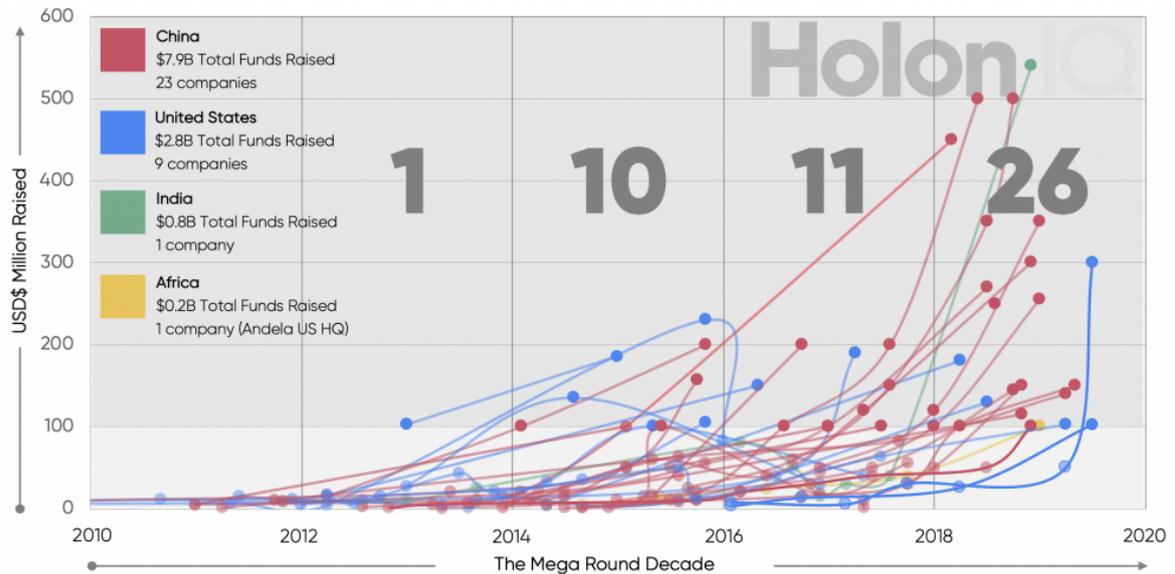


Source: HolonIQ, retrieved July 30, 2019, from <https://www.holoniq.com/notes/400-global-edtech-vc-deals-in-1h-2019-worth-3.5b/>.

The values of invested capital in particular transactions were also significant. Since the first one in 2013, we could see 48 VC rounds of 34 companies that raised over US\$100 million in this decade. The only US\$100 million and more round in the prior decade was US\$103 million round in October 2008 by Ambow Education Group based in Beijing (Holon IQ, 2019). The

rationale for this transaction was the belief that the education sector would grow despite the global financial crisis.

Figure 3. Global EdTech Venture Capital deals over US\$ 100 million since 2010



Source: HolonIQ, Retrieved July 30, 2019, from <https://www.holoniq.com/notes/400-global-edtech-vc-deals-in-1h-2019-worth-3.5b/>.

In the figure 3 above, the time span with most EdTech ‘mega rounds’ (over US\$100 million) in this decade can be seen from 2018 on, along with the global deal value trend. China dominated this decade of growth, in both the number of investment deals, as well as the total deal value. Out of 34 companies that raised the ‘mega round’, 23 were Chinese, 9 American, 1 Indian and 1 African with US headquarters. These Chinese companies raised approximately 68% of the total deal value of all 48 ‘mega rounds’ (Holon IQ, 2019). However, the biggest EdTech investment round so far, when it comes to the deal value, was raised by Indian EdTech startup BYJU’s. In December 2018 it raised US\$540 million and topped the previous record of US\$500 million round by Chinese startup VIPKID in June the same year (Holon IQ, 2019).

In 2018, almost 50% of all VC investments in EdTech was raised in just 27 deals, out of which every was over US\$50 million. Again, China made up approximately 70% of the deal value and was followed by India, US, France and Vietnam, with 17%, 13%, 3% and 3% respectively (Holon IQ, 2019). All 27 global EdTech VC deals over US\$ 50 million might be seen in the figure 4 below.

Figure 4. Global EdTech Venture Capital deals over US\$ 50 million in 2018

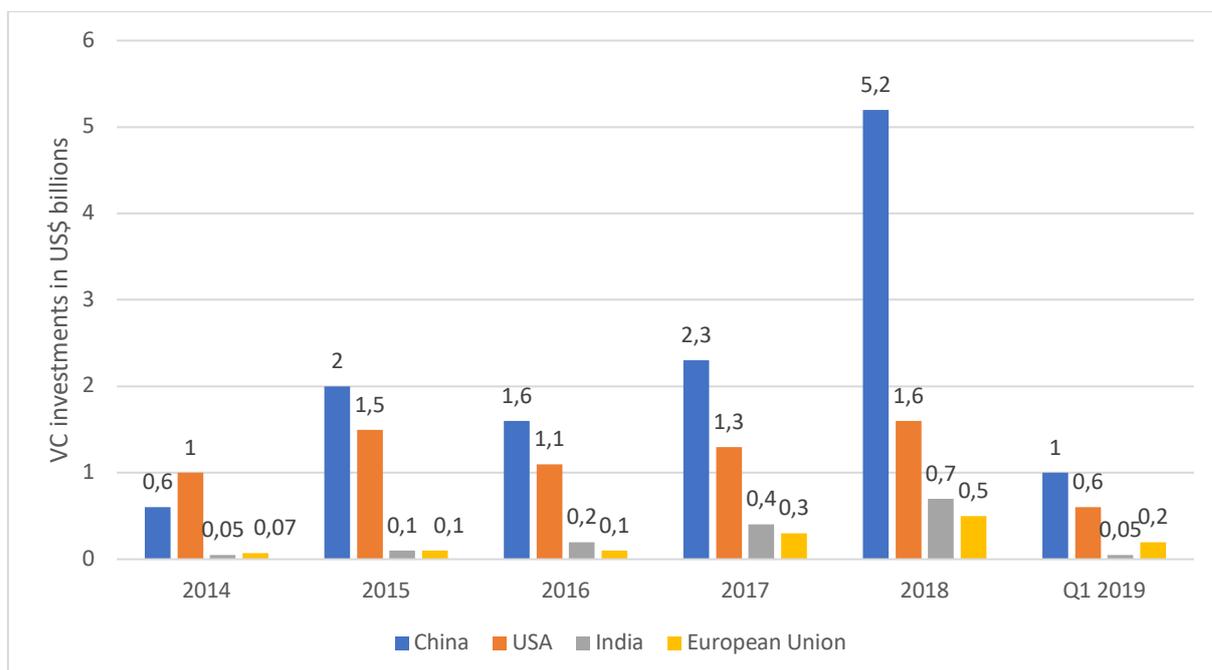
\$3.8B of Venture Capital in ~27 EdTech Rounds > \$50m USD in 2018



Source: HolonIQ, retrieved July 30, 2019, from <https://www.holoniq.com/news/2018-mega-deals/>.

When it comes to the world’s regions that raised the most money in recent years, the previous observations seem to all fit together and there is clearly an ongoing global trend. Till 2014, the USA was setting trends and pace of the global EdTech market and that year nearly 60% of all VC investments in EdTech was invested in the USA. However, a year later USA was no longer the leader. Over the past four years the country driving the investment growth the most was China. As mentioned before, the VC investment in education in 2018 reached US\$8.2 billion globally (Holon IQ, 2019). Over 60% of that investment was raised in China, which was followed by USA, India and Europe with 20%, 9% and 6% respectively, which might be seen in the figure 5 below. Moreover, despite the warnings of China’s incoming ‘capital winter’, it continued to attract the biggest investments in EdTech to its territory in Q1 2019 (Holon IQ, 2019).

Figure 5. Global education Venture Capital investments in China, USA, India and European Union 2014-Q1 2019



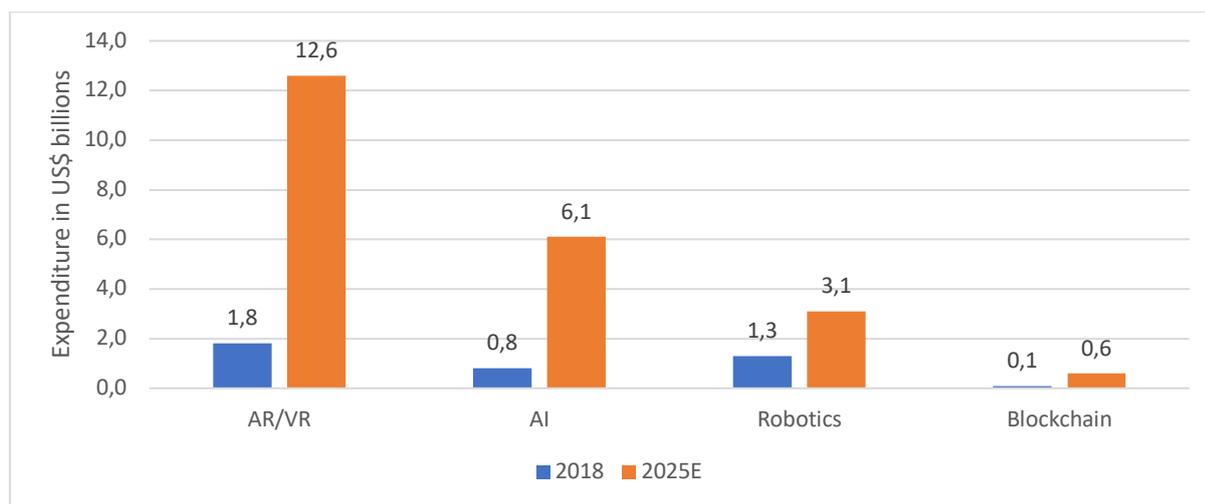
Source: HolonIQ, retrieved July 30, 2019, from <https://www.holoniq.com/edtech/10-charts-that-explain-the-global-education-technology-market/>.

An interesting emerging market here is India. Together with China, they form a potential learning market of almost 2.8 billion people and in 2018 accumulated over 70% of the world's education VC investments, which clearly shows that Asia has experienced the world's fastest growth in investment into the EdTech sector (Finance Digest, 2016; Holon IQ, 2019). When it comes to the European Union and Europe, they have seen increases in VC investments and M&As over the years, but continued to be a largely under-invested and fragmented market (Finance Digest, 2016).

The analysis of the 'mega deals' in 2018 prepared by Holon IQ clearly shows six categories that are emerging in the education sector. The three biggest investment trends totaled US\$3.4 billion, which was over 80% the total investment value. The first category, which is After-school, tutoring and language learning in 11 transactions raised US\$1848 million, which was almost 50% of total 'mega deals' value. Second biggest category was Online learning, which raised US\$846 million and third was Q&A Content Platforms, which total deal value reached US\$750 million. Last three were Education Management and Financing, Schools and Upskilling with US\$ 290 million, US\$ 150 million and US\$ 100 million, respectively.

When it comes to the education market expenditure trends in the nearest future from the perspective of the technology used, HolonIQ predicts the most money will go for the application of AR and VR technologies, which might be seen in figure 6 below.

Figure 6. Global EdTech expenditure in AR/VR, AI, Robotics and Blockchain technologies 2018-2025



Source: HolonIQ, retrieved July 30, 2019, from <https://www.holoniq.com/edtech/10-charts-that-explain-the-global-education-technology-market/>.

By 2025, almost US\$13 billion is expected to be spent globally for products using these technologies, which is a significant increase from US\$1.8 billion spent in 2018. Second biggest trend would be the use of AI. An increase here is predicted not to be as significant when it comes to the value, but bigger when it comes to the growth rate. The spending is predicted to increase over 7.6 times to US\$6.1 billion by 2025 in comparison to US\$0.8 billion in 2018. The remaining two recognized big trends are Robotics and Blockchain with predicted spent by 2025 of US\$3.1 billion and US\$0.6 billion respectively. For sure, these technologies embedded into education delivery and learning process will help to meet the challenges of fulfilling the needs of future education market.

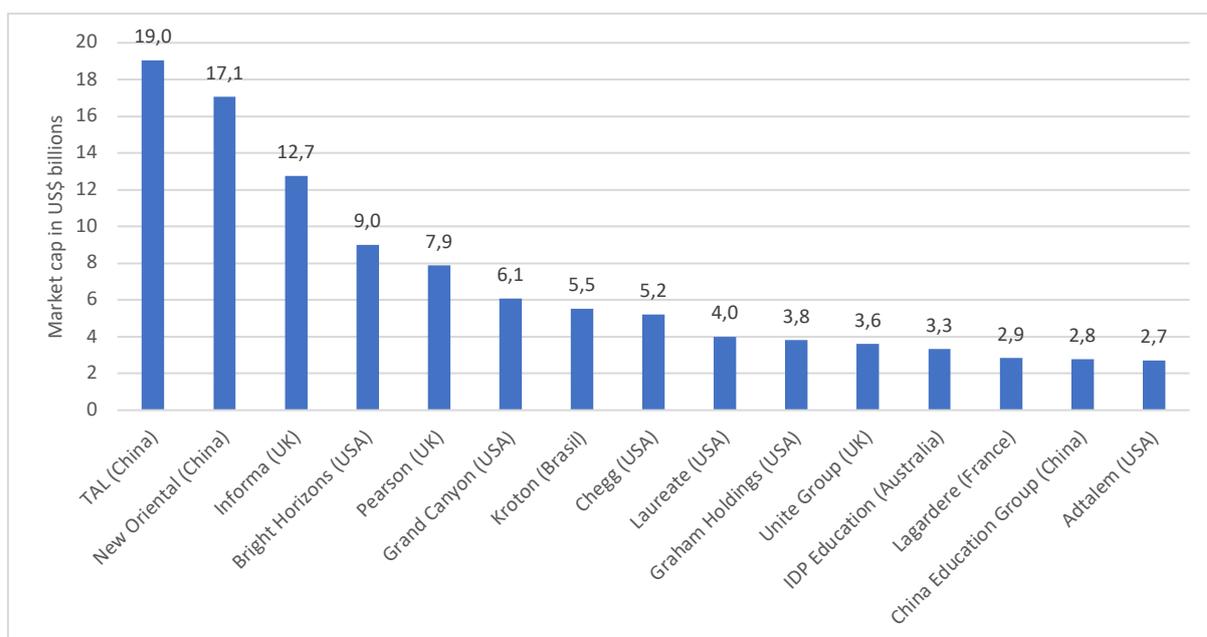
1.5. Education giants and biggest EdTech startups

1.5.1. Largest publicly listed education companies

According to Holon IQ, the education stocks all over the world as for 21 March 2019 were worth US\$190 billion, which is an increase of US\$34 billion since 6 July 2018, when the

previous analysis was conducted (Holon IQ, 2018). In the end of March 2019, 250 education companies listed on stock exchanges around the world generated US\$79 billion revenue and US\$10 billion EBITDA (Holon IQ, 2019). Approximately 35% (US\$67 billion) of the total market capitalization were stocks of 37 companies with their headquarters in China. The second largest share of 27% (US\$51 billion) had 40 companies headquartered in the USA and the third of 12% had companies with their HQ in United Kingdom. The size of the third share was close to the market capitalization of the largest education company in the world, which is TAL (Tomorrow Advancing Life) Education Group from China (Holon IQ, 2019). With its market cap of approximately US\$20 billion, it had over 10% share of the total value of education stocks all over the world. Together with the second largest public education company New Oriental Education & Technology Group also from China (US\$12.8 billion market cap as of 21 March 2019), they had over 17% share. The Holon IQ analysis shows that there were over 40 companies in the world with a market cap over US\$1 billion and the median of all 250 companies was US\$98 million (Holon IQ, 2019). Figure 7 below shows 15 largest public education companies in the world with their country of origin and market capitalization as of 9 August 2019.

Figure 7. Market capitalization of 15 largest public education companies as of 9 August 2019



Source: Own elaboration based on Yahoo Finance, Retrieved August 9, 2019, from <https://finance.yahoo.com>.

1.5.2. Largest EdTech startups

According to Navitas Ventures, as of January 2019 there were ten EdTech unicorns globally, which are private companies valued at over US\$1 billion (Rodriguez, 2015; Zhang, 2019). The firm added that the companies it called as unicorns are “privately held startups that are innovative adopters of technology” and it used publicly available data to prepare the analysis. Out of these ten unicorns, China is home to seven, two are based in USA and the last one is in India. CB Insights on its “The Global Unicorn Club” list also presented ten unicorns, but it used data as of May 2019 and included whisper valuations (CB Insights, 2019). Therefore, the list did not include exactly the same companies. Out of ten unicorns, again seven are Chinese, two American and one Indian. The third source, Holon IQ, also claimed that there were ten EdTech unicorns as of July 2018, but this time six were from China, three from USA and one from India (Holon IQ, 2018). In the table 2 below I prepared a list of EdTech unicorns mentioned by the abovementioned sources with their total funding and latest available valuation.

Table 2. EdTech unicorns as of 9 August 2019

	Company	Country	Total funding (millions US\$)	Latest valuation (billions US\$)	Date of latest valuation
1	BYJU'S	India	\$1 042,5	\$5,5-5,75	Jun 21, 2019
2	VIPKID	China	\$825,1	\$3,5	Jun 21, 2018
3	Zhangmen	China	\$473,2	\$3-4	Feb 18, 2019
4	Yuanfudao	China	\$544,2	\$3,0	Dec 26, 2018
5	Zuoyebang	China	\$1 085,0	\$2,9	Oct 2018
6	ZhiHu	China	\$502,3	\$2,5	Aug 8, 2018
7	Logical Thinking (Luojiwei)	China	\$188,2	\$1,2	Jul 20, 2017
8	17zuoye	China	\$585,0	\$1,0	Mar 7, 2018
9	Coursera	USA	\$330,8	\$1,0	Apr 25, 2019
11	HuJiang	China	\$223,3	\$1,0	Oct 29, 2015
12	Age of Learning	USA	\$181,5	\$1,0	May 3, 2016
13	Udemy	USA	\$173,0	\$1,0	Jun 2, 2016

14	Udacity	USA	\$160,0	\$1,0	Nov 11, 2015
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Source: Own elaboration based on Navitas Ventures, retrieved August 9, 2019 from <https://blog.navitasventures.com/china-edtech-insights-part-1-e08bff139e73>, and CB Insights, retrieved August 9, 2019, from <https://www.cbinsights.com/research-unicorn-companies>, and HolonIQ, retrieved August 9, 2019 from <https://www.holoniq.com/edtech-unicorns/>.

Most probably the VC investments in these unicorns and many more EdTech companies will drive IPOs, as these VC funds will be seeking exits, also in the form of public offering. Holon IQ predicts the amount of public education companies with market capitalization over US\$1 billion to exceed 100 by 2025, from 30 listed in 2018 (Holon IQ, 2019). This means that this number will grow over 10 times in 10 years, as there were just 10 such companies in the world in 2015.

2. EdTech innovation in China's education market

2.1. Market data

2.1.1. China's education market

In China, together with its economy, the education market is growing at a very fast pace. According to Deloitte, from USD261 billion (RMB1.64 trillion) in 2015, the education market in 2018 was predicted to reach USD393.28 billion (RMB2.68 trillion) and grow to USD492.75 (RMB3.36 trillion) in 2020, and close to USD732.74 billion (RMB5 trillion) in 2025 at a CAGR of 10.8% (Deloitte China, 2018; Feng, 2018). Currently, the biggest share of the market belongs to Personal training (25.7%), K12+STEAM (22.2%) and private kindergartens (14.6%), but that is a subject to change. Deloitte estimated that by 2020 K12+STEAM will outpace Personal training and reach 24% market share. The share of online education in market is predicted to grow from 9.32% in 2018 to 10,41% in 2020 and the segments most responsible for this growth will be Online K12+STEAM education and Online early childhood education.

When it comes to the number of students, China has the world's largest education market (Zhang, 2019). There are approximately 283 million students from pre-kindergarten to higher education according to JMDedu, the biggest B2B industry media company in China (JMDedu, 2018). To put this into perspective, the number of students in the United States is about 77 million (nearly 4 times smaller), in the UK it is 12.5 million (nearly 23 times smaller) and in Australia 5.3 million (over 53 times smaller) (Zhang, 2019). However, that shouldn't be a surprise since roughly 20% of the world's population lives in China. Also, the recent end to the one-child policy, which lasted for about 35 years, will most likely cause a growth in the number of students in the coming years (Geromel, 2019). When it comes to the English learners in China, at the beginning of this decade the number was estimated to be 400 million people, which is almost one third of the total population number and means that there is a great potential of further growth (Murphy, 2013). According to JMDedu, there were 171.86 million online learners in 2018, out of which 142.21 million were learners via mobile devices. The half-year growth for both groups was two-digit: 10.7% and 19.6% respectively (JMDedu, 2018).

2.1.2. China's online education market

According to the report published by UBS Securities, the online education market in China will exceed USD\$103.4 billion (RMB700 billion) in 2025 and its growth will be driven by such technologies as Artificial Intelligence (AI), Virtual Reality (VR), as well as parents' increasing awareness of the education value (Lin, 2018)¹. So far, the market was growing rapidly with the annual growth rate of almost 20% every year from 2013 (iResearch, 2018). Even though the growth rate is predicted to slow down in the next years, from the top of 21.9% in 2017, it will not drop below 20% till 2021, which can be seen in the figure 8 below. At that point the revenues are expected to exceed USD67 billion (RMB450 billion), which is over two times the number in 2017.

Figure 8. China's online education market revenue 2012-2022

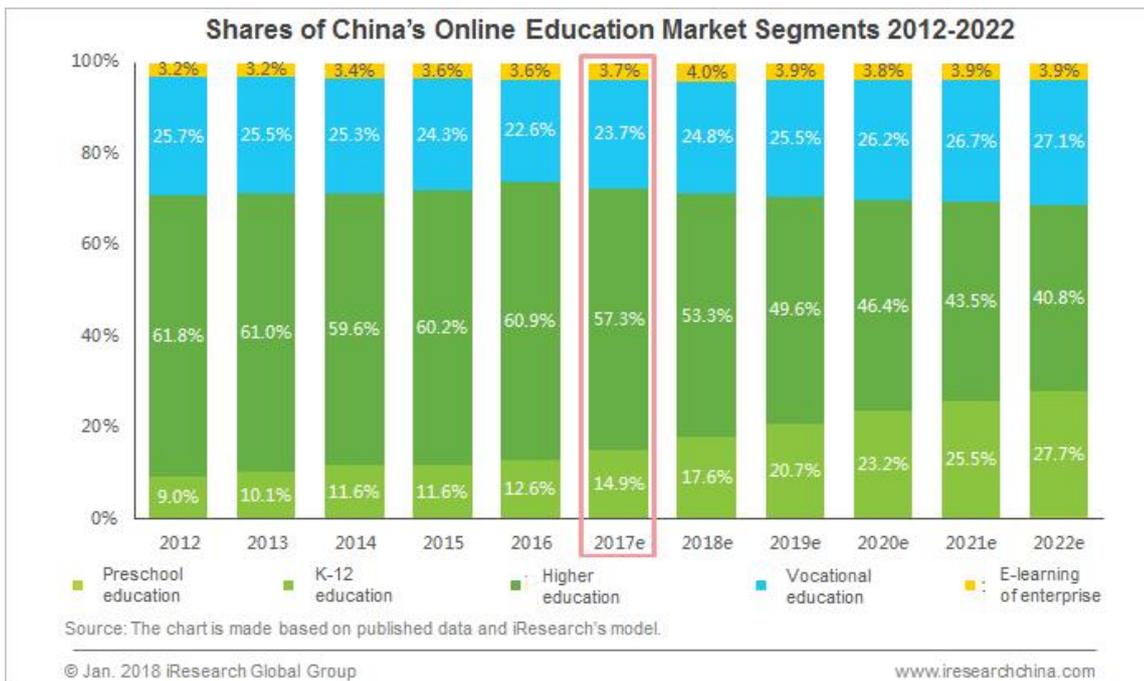


Source: iResearch, retrieved September 18, 2019, from http://www.iresearchchina.com/content/details7_40642.html

¹ 2.1.2. China's online education market, 2.1.3. China's AI online education market and 2.3.2 Education investment trends sub-subchapters were elaborated for my final project "Artificial Intelligence disruption in China's Education Technology" at Emerging Topics in Chinese Strategy class at Guanghai School of Management, Peking University, during an exchange semester of 2018-2019 academic year.

Currently, over 95% of Online Education Market is split among three segments: online K12 education, online higher education and online vocational education (iResearch, 2018). Out of these three, the share of K12 education is predicted to grow the most rapidly. From just 12.6% in 2016 it is predicted to be 27.7% in 2022, which can be seen in the figure 9 below.

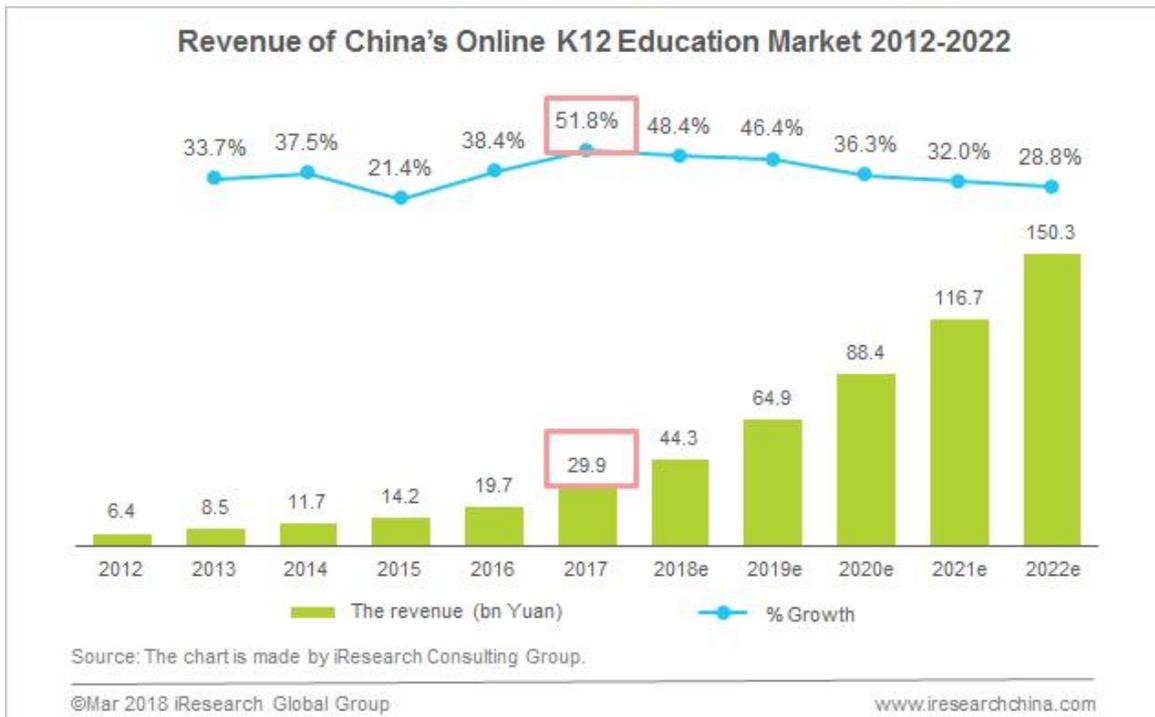
Figure 9. Share of China’s online education market segments



Source: iResearch, retrieved September 18, 2019, from http://www.iresearchchina.com/content/details7_40642.html.

Since 2012, China’s online K12 education segment noted a growth rate higher than 20% (iResearch, 2018). In 2017, it reached the highest number so far of 51.8%. The main justification for such a spectacular growth, according to iResearch, is the boom of one-on-one live-streamed lessons, which enable teachers to also reach out to students in remote areas and smaller cities. It is expected that the demand for such solution in third and fourth-tier cities in China will have a significant growth and will be the main driver and contributor to the revenue of this segment in future (Liu, 2017). Before the boom, many companies were low profitable, which can be seen in the figure 10 below, especially in 2015.

Figure 10. Revenue of China’s online K12 education market



Source: iResearch, retrieved September 18, 2019, from http://www.iresearchchina.com/content/details7_44246.html.

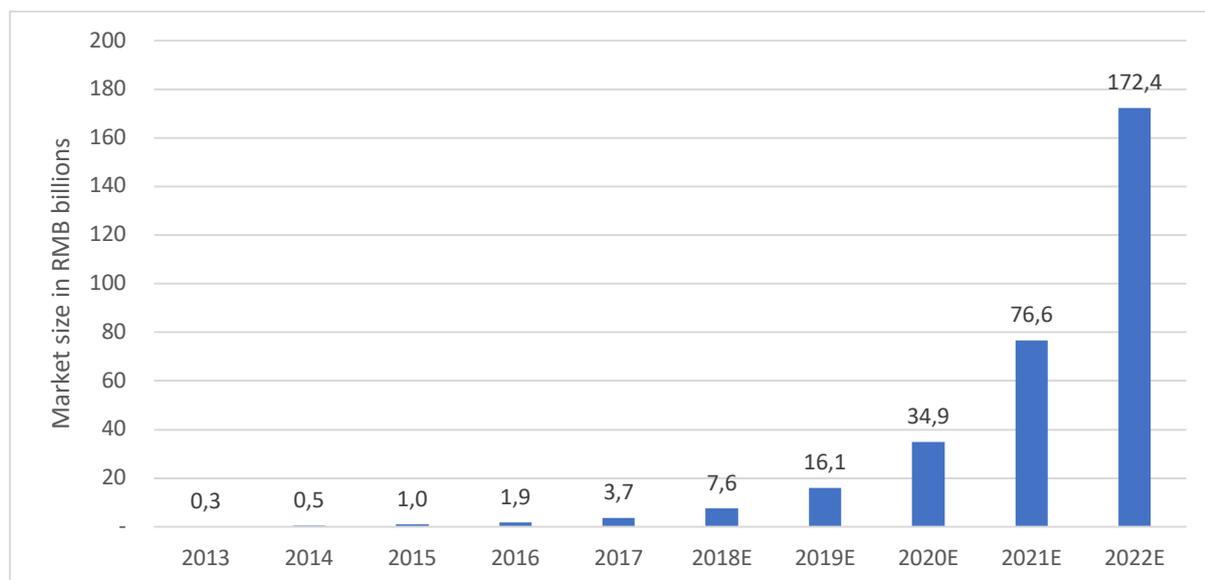
However, the pattern of China’s K12 Online Education Market is predicted to change (iResearch, 2018). In future, there will be more national brands and many market segments with leading companies in each of them. When it comes to users, they will have a wide range of highly individualized learning demands and therefore the companies with more different detailed services will attract more users. Moreover, it is predicted that with the development of this industry, the share of offline services will increase. So far, monetization problem of online and the traffic shifting of offline venues increased the cooperation between them. Nevertheless, institutions with larger number of students have greater influence in the existing market and will have a stronger right of speech in future.

2.1.3. China’s AI online education market

According to a study by Tsinghua University, in 2017 China’s AI market was worth US\$3.55 billion (RMB 23.74 billion), up 67 per cent from 2016 (Deng, 2018). The data in the report shows that the market is estimated grow in 2018 by even more than the year before – 75%. The technologies accounting for most of the market were computer vision, voice and natural

language processing (NLP). These and many more AI technologies are expected to have a substantial impact on the education market. According to iResearch industry report prepared for LAIX Inc., AI-powered learning products and services can significantly increase the market size thanks to their convenience, personalized learning experience and affordable prices. The educational segments that can benefit from this technology would be languages and subjects learning, preparation for tests for language or subject proficiency, and professional and vocational trainings in the fields such as finance, IT and healthcare. The size of China’s AI-powered online education market measure by revenues reached US\$ 0.55 billion (RMB 3.7 billion) in 2017 and is expected to significantly grow to US\$ 25,8 billion (RMB 172.4 billion) in 2020, with the compound annual rate growth of 118.3%, which might be seen in the figure 11 below (LAIX Inc., 2018).

Figure 11. Size of AI online education market in China



Source: Form F-1 Registration Statement of LAIX Inc., retrieved August 9, 2019 from <https://www.sec.gov/Archives/edgar/data/1742056/000119312518264876/d569067df1.htm>.

2.1.4. Market drivers

Since 2012, Chinese education market has experienced a significant growth of EdTech solutions both in the private and public sectors. There were several drivers behind this growth, such as consumer consumption growth, expanding internet penetration, inflow of Venture Capital money and favorable government policies to name a few (JMDedu, 2017). In the next

subchapters, I will analyze these drivers deeper to get a better understating of their scale and impact.

2.2. Consumers

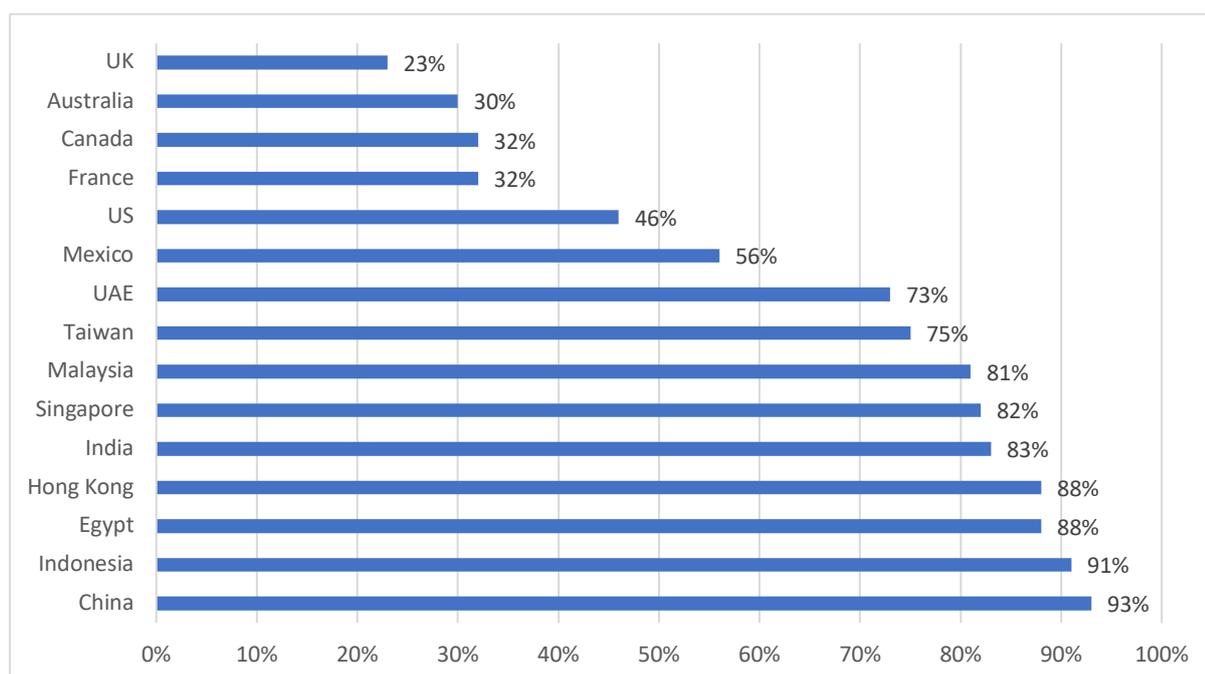
To get a better understanding of EdTech sector in China, I interviewed Jeffrey Towson, a private equity investor and advisor, author and keynote speaker, and Professor of Investment at Peking University, Guanghua School of Management in Beijing (Towson, 2019). Professor Towson is an expert on digital China and latest technology trends in Asia. His writing and speaking are on how rising Chinese consumers and companies are disrupting global markets. Together with Jonathan Woetzel, a senior partner of McKinsey & Company and also Peking University's Guanghua School of Management professor, they wrote three best-selling books: "The One Hour China Book: Two Peking University Professors Explain All of China Business in Six Short Stories", "The One Hour China Consumer Book: Five Short Stories That Explain the Brutal Fight for One Billion Consumers" and "The One Hour China Contrarian Book: Four Things Everyone is Getting Wrong About China Business". During the interview, which was conducted in English on August 11, 2019, via WeChat call, I asked Professor Towson about the state and innovativeness of Chinese EdTech, as well as risks associated with this sector in China. The full interview transcript is attached in the Appendix 1.

"For me the starting point for China is always consumers. Especially anything digital, because the digital world of China is driven by consumer demands. Anytime there is a direct connection between any business and Chinese consumers, things happen very, very quickly. If it has to go through something structured like hospitals, then it doesn't happen. Financial services – it doesn't happen. However, if it is direct to consumers, it really moves. Now, Chinese consumers, and really what you are thinking of are families, it's about families, that's the unit of buying, really cares about education. They care about it more than any major country I have ever seen. It is deep in the culture and it is deep in this idea that you sacrifice everything for your kids. It's in the family priorities" (Towson, 2019).

As it turns out, Asia's population is education-fixed and Chinese households spend a significant amount of their income on education (Lynch, 2018). According to JMDedu, the education spending reaches up to 5% of urban citizen's annual total expenditure. To put that into perspective, it is double the number in America of 2.1% (JMDedu, 2018). When it comes to

families with K-12 children or preschoolers, the numbers are even higher. Different sources say that families with K-12 children spend from 15% to 21% of their total income on extra education and tutoring (Milken, 2017; Wan, 2017; JMDedu, 2018). Families with preschoolers spend even more than that – an average of 26% of their income (Cai, 2018). These numbers were proven by a survey of nearly 52,000 parents (mostly middle-class) across China that was conducted by website Sina.com in November 2017 (Cai, 2018). Moreover, the results unveiled that 90% of preschool and 81% of K12 (from six to eighteen years old) children attended tutoring courses. HSBC Value of Education report 2017 shows even higher numbers. According to the report, mainland China is number one country in the world when it comes to the share of parents who have been paying for private tuition of their children with a tremendous number of 93%. In this comparison, out of 8 first places 7 were taken by Asian countries with only Egypt as an exception that represented another continent, which might be seen in the figure 12 below (Cai, 2018).

Figure 12. Share of parents who have paid for private tuition of their children



Source: South China Morning Post, retrieved July 23, 2019, from <https://www.scmp.com/economy/china-economy/article/2168189/chinas-middle-class-spend-less-they-scrimp-and-save-their>.

Moreover, as Chinese consumers are getting richer their disposable income is growing, especially when it comes to the 400 million middle-class citizens (Cai, 2018). Over the last decades of China's spectacular economic growth, household incomes grew several-fold. With

each next year, millions of new households for the first time become able to afford supplementary education of their children (Zhang, 2019). The important aspect about the disposable income growth, which Professor Towson mentioned in the interview, is that education is one of these sectors that grows together with it.

“Chinese consumers are growing on wealth, but that’s not always great depending what you are doing. If you are selling food, people don’t keep spending more and more on food – you do kind of run out of what you can spend on food. You don’t spend that much on appliances – you don’t buy 10 washing machines. But certain sectors keep going up with money. One of them is education spending. The more money you have, the more money you spend on education. And given that it is a bit of an arms race, if other families are spending more, you have to match it, or your kid does not do as well. In theory. So, it’s one of the few sectors that keeps going up. Healthcare also goes up, you can spend more and more on healthcare, and travel tends to go up, you can just take nicer vacation. Education is one of those ones that is going to ride the wave of Chinese spending for the next 20 years. Not everyone will benefit from it. People selling tissues or washing machines aren’t going to keep going up. People will not buy 10,000 dollars washing machines. So that’s one of the biggest benefits of this sector that it really does benefit from the spending curve” (Towson, 2019).

During the interview, Professor Towson also mentioned the gaokao, which is Chinese version of the American SAT and British A-level exams. “There is also the gaokao, that every student has to take at the end of high school, and they are being prepared for it for like a decade. Families will spend an amazing amount of money to do that. So, a lot of what you see in education tech is about either language training, because they have to pass this test if they want to go to university or any other training outside of China. And the gaokao is like an arms race. It’s not that you just have to spend money on it, but if another family is spending more, you also have to spend. It is like an endless competition for who is going to spend more on their kids’ education to get them through the gaokao. It’s like an arms race at the family level. Chinese families spend more on private education than any group on the planet as far as I know. That’s how I think about it, it’s like an arms race between the parents on who can spend more on their kids’ education prior to the gaokao,” he said (Towson, 2019).

Gaokao, which in Chinese literally means “high exam”, is known as one of the toughest exams in the world (Ma, 2019). It typically includes the Chinese language, mathematics and a foreign

language, which usually is English. In 2018, about 9.75 million students took it to be able later to apply to higher education institutions of their dreams (Xinhua, 2018). In 2019, the number exceeded 10 million students competing for the chance to be admitted to one of 150 first-tier universities and their chances are rather low – 6% to be precise (calculations exclude students from privileged or well-connected families, who will surely be admitted) (Xinhua, 2019; Cai, 2018). Moreover, the test scores are already accepted by universities in the US, UK, Italy, Australia and Canada, and the number of institutions is increasing year on year (Ma, 2019). This only increases the desire of students and their parents to pass the test with the highest grades. Some students, like Yu Minhong, the CEO of China’s second biggest education company New Oriental, took the exam several times (Xinhua, 2018). From 1978 to 1980 he passed it three times to finally get admitted to Peking University, the country’s top university.

The effort and resources put in the preparations for the exam by both kids and parents is hard to match for the west and the work-life balance is very different (Geromel, 2019). During weekends, millions of middle-class parents on the mainland spend most of their time attending tutoring sessions with their children, as they want to help them to deeply understand advanced topics such as permutations and combinations in math and classical Chinese (Cai, 2018). According to Tony Wan from EdSurge, the obsession with tutoring lies deep in cultural tradition: “The masochistic obsession with studying has deep roots. China boasts the longest continuous history of standardized testing, dating back to the imperial examinations starting in its second dynasty, in 206 BC” (Anderson, 2017).

Chinese families value and prioritize their children’s education. According to Alison Baum, Managing Partner at Fresco Capital “Asian consumers and businesses alike are culturally prone to seeing education as an investment and not an expenditure” (Anderson, 2017). Parents want to invest in their children to grant them a better future. One of the bright scenarios would be sending their children to pursue a higher education diploma abroad. Over 600,000 Chinese students choose to study abroad each year, and this has grown at 15% CAGR over the last five years (Deloitte China, 2018; Zhang, 2019). In order to do that, they must pass the English language test very well and parents are sending them to language classes and after-school tutoring from a very young age (Zhang, 2019). The prestige of the university is also very important. Chinese parents, especially from the middle class, understand that it’s much more difficult to get a stable, well-paid job, without a degree from a good university (Cai, 2018). Moreover, in a country with high levels of wealth inequality, it might be one of a few ways to

join the small percentage of elites (Zhang, 2019). The anxiety and hope make middle-class parents to push their children to study hard and to save money to later invest in education (Cai, 2018).

Another important driver for the EdTech market growth is that China is one of the fastest digitizing societies in the world (Zhang, 2019). Together with the internet penetration growth there is a rapid development of many internet-based businesses, including EdTech companies. In general, Chinese consumers quickly adopts new technology innovations. A great example of that is the time span in which China has become an almost cashless society by introducing mobile payment solutions based on QR codes by Tencent and Alibaba (Zhang, 2019). Together with the country's economic growth and technology development since 1978, China's society had to accept the 'change as the new constant' and it might be one of the reasons for the openness for many new EdTech solutions.

2.3. Investments

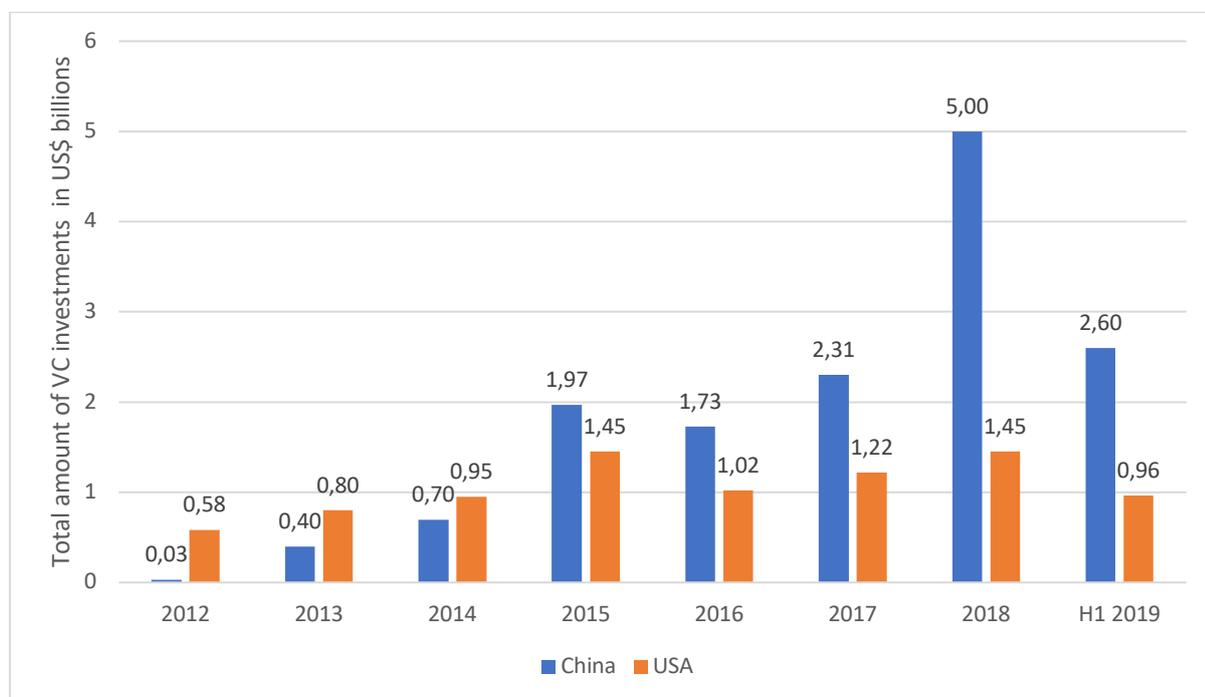
2.3.1. Venture Capital investment data

According to Metaari report, in 2012, there were only six investments made to online education companies in China in 2012 for a total of \$33.2 million (Metaari, 2018). In 2013, the number of companies increased to 47 and investment totaled to \$398.5 million. Over the course of six years, these numbers changed quite significantly. According to HolonIQ, China's total VC investment in education businesses in 2018 was \$5.2 billion USD, 2.6 times higher than in 2015, when the online education became a hit (JMDedu, 2018). From a global perspective, China secured over 50% of global VC investment in education in that year. The exceptional growth in the 2018 itself for China's EdTech funding was 26%. Different source, JMDedu, analyzed that in 2018 China's EdTech companies raised total of USD5 billion with 538 deals (JMDedu, 2019). Already from January to October 2018 total amount of investments in China's EdTech was almost USD4.5 billion and it almost doubled the amount in all of 2017 (JMDedu, 2018).

In comparison to the total capital raised in USA, China's results look massive, which might be seen in the figure 13 below. According to EdSurge, the total amount of investments in the USA in all of 2018 was \$1.45 billion USD, even though it was the highest number ever raised (Wan, 2019). Different source, HolonIQ says that it was \$1.6 billion USD, but the order of magnitude

is quite similar. Both numbers clearly show that in 2018 China-based EdTech businesses raised over 3 times more VC money than American. Moreover, the number of deals in the US decreases since 2015, when it reached over 220, and in 2018 reached less than 120. Nevertheless, 2015 was the year that China took over the USA in both the number of investment deals and the total investment amount. When it comes to the number of deals in China, it is consecutively increasing each year since 2012 and more than doubling the amount of 2015 – 220 deals, in 2018 – 538 deals. So far in H1 2019 EdTech startups raised in China USD2.6 billion across 184 deals, while in the USA it was USD962 million in 65 deals (JMDedu, 2019; Wan & Millward, 2019).

Figure 13. Comparison of Venture Capital money raised in China and USA 2012-H1 2019



Source: Own elaboration based on JMDedu, retrieved 30 July, 2019, from <http://getchina.jmdedu.com/Data/China%27s%20Edtech%20Investment>, and EdSurge, retrieved 30 July, 2019, from <https://www.edsurge.com/news/2019-01-15-us-edtech-investments-peak-again-with-1-45-billion-raised-in-2018>, and Metaari, retrieved 30 July, 2019, from http://www.metaari.com/assets/Metaari_s-Analysis-of-the-2016-Global-Learning-Technology-Investment-Pat25875.pdf.

A great number of China’s top-funded EdTech startups have a few things in common. As it turns out, they operate in sectors with persistent demand and have a massive target consumer base.

On top of that, they are the earliest to adopt technologies to the market. The two largest sectors are K12 online homework platforms and online language learning with native English-speaking teachers (JMDedu, 2019). In 2018, startups from these two sectors together amounted to over 80% of the top 10 funding deals.

Table 3. Comparison of the largest funding rounds among EdTech startups in China and abroad

	China		Non-China	
1	Zuoyebang	USD 500m	Byju's	USD 540m
2	VIPKID	USD 500m	DreamBox Learning	USD 130m
3	Zuoyebang	USD 350m	Connexeo	USD 110m
4	Yuanfudao	USD 300m	MasterClass	USD 80m
5	17zuoye	USD 250m	OpenClassrooms	USD 60m
6	VIP PEILIAN	USD 150m	CampusLogic	USD 55m
7	Zhangmen	USD 120m	Commonbond	USD 50m
8	Golden Education	USD 115m	Trilogy Education	USD 50m
9	DaDaABC	USD 100m	Varsity Tutors	USD 50m
10	Knowbox	USD 100m	Topica EdTech Group	USD 50m

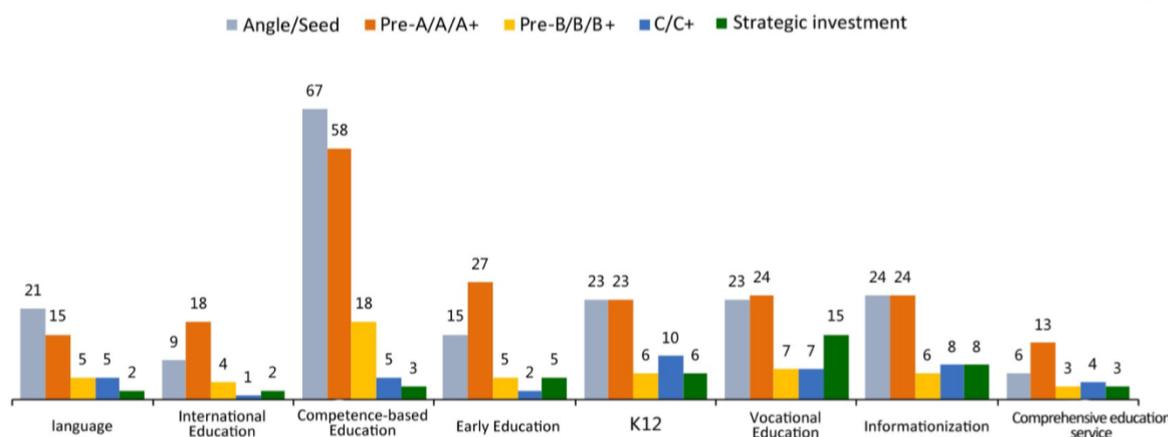
Source: Own elaboration based on EdSurge, retrieved 10 August, 2019, from <https://www.edsurge.com/news/2019-01-15-us-edtech-investments-peak-again-with-1-45-billion-raised-in-2018>, and JMDedu, retrieved 11 August, 2019, from <https://medium.com/@EdtechChina/decoding-2018-chinas-education-market-538-deals-china-edtech-raised-around-5-billion-in-2018-a913023bc878>.

Except the largest single funding round in 2018 secured by Indian Byju's, the rest of Top 6 biggest EdTech investments was raised by Chinese companies, which might be seen in the table 3 above (Wan, 2019; Fu, 2018). Both Zuoyebang and VIPKID secured US\$500 million each and they were followed by Zuoyebang another round, Yuanfudao and 17zuoye, securing US\$350 million, US\$300 million and US\$250 million respectively. Even though in a single round Buju's secured the biggest capital, Zuoyebang raised two rounds in three months of 2018 with the highest total amount of a staggering US\$850 million. With previous funding series the company raised more than US\$1 billion and replaced VIPkid as the most founded EdTech company in China (JMDedu, 2019). A bit earlier, in June 2018, at a valuation of more than

US\$3 billion, VIPKID announced that it raised US\$500 million in its series D+ financing, which was the largest round of funding ever raised in the sector globally to date (Bloomberg, 2018; Business Wire, 2018). Moreover, the company is already preparing for rising another round of the same size (Li, 2019). These sums of fundraised capital leaves companies from other countries far behind. To put this in perspective, the largest EdTech round of financing in 2018 in the USA was raised by DreamBox Learning – US\$130 million.

An interesting emerging sector in China is competence-based learning. According to a report by Taoli Capital, in 2018 the highest number of Angel/Seed and Pre-A/A/A+ financing rounds took place in that sector and reached 67 and 58, respectively, which might be seen in the figure 14 below. Moreover, the rise of this sector might be seen on particular examples, such as VIP Peilian, which in 2018 raised a US\$150 million Series C round. The company is an online music education platform, which as one of the first practitioners develop the “Internet + Music Education” model and started to offer one-on-one online music practice courses (JMDedu, 2019).

Figure 14. Distribution of financing rounds in China's education sub-sectors in 2018



Source: JMDedu, retrieved 20 August, 2019, from <https://medium.com/@EdtechChina/decoding-2018-chinas-education-market-538-deals-china-edtech-raised-around-5-billion-in-2018-a913023bc878>.

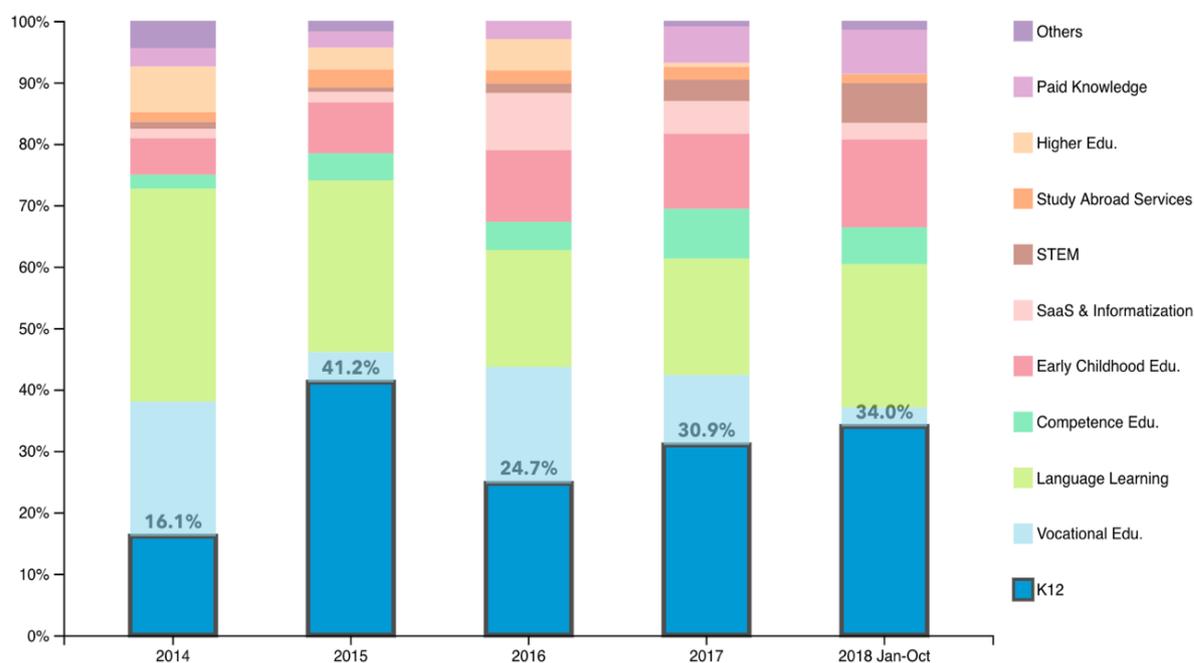
As it turns out, China is leading not only the investment in EdTech across the world, but also the investment in AI. According to a study by Tsinghua University, from 2013 to the first quarter of 2018 China’s AI has attracted about 60% of all global investment in that industry (Deng, 2018). On top of that, China holds the most AI patents and ranks first in the quantity and citation of research papers. Taking into consideration the growing use of AI in offerings of

Chinese EdTech companies, this is crucial factor that might help them build advantaged over their foreign competitors.

2.3.2. Education investment trends

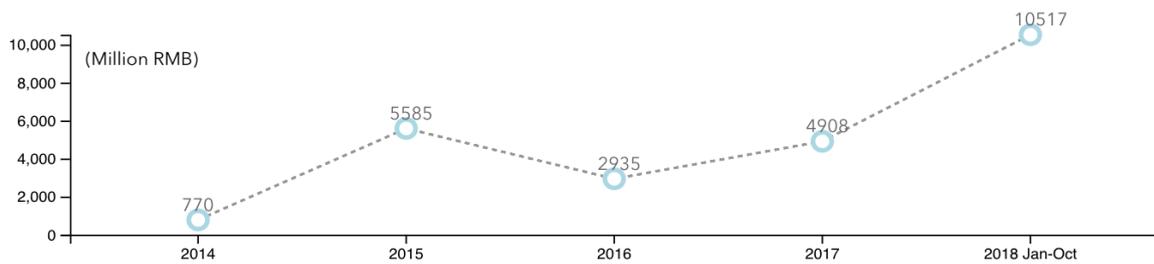
According to JMDedu, in 2018 the EdTech VC money in China was mostly invested in K12, STEAM, SaaS education, knowledge-based pay and study abroad (JMDedu, 2018). The biggest growth rate was observed in Language learning and STEAM – both by 50%. The agency explains that there are three main education investment trends in 2018. The first one is the Online K12 education and especially supplementary K-12 learning, which share of total investment might be seen in figure 15 below (JMDedu, 2018). The funding amount of this sub-market since 2014 might be seen in the figure 16 below. In 2017, the most invested type of this trend was online one-on-one tutoring, which aggregated around US\$140 million and it is predicted to continue in 2018. A few examples of companies in this trend are 17zuoye, Knowbox or Sanhao, which are homework tools that primarily focus on helping students prepare for standardized exams such as the gaokao (Zhang, 2019).

Figure 15. Investment share of K12 sub-market in China



Source: JMDedu, retrieved September 10, 2019, from <http://getchina.jmdedu.com/Data/China%27s%20Edtech%20Investment>.

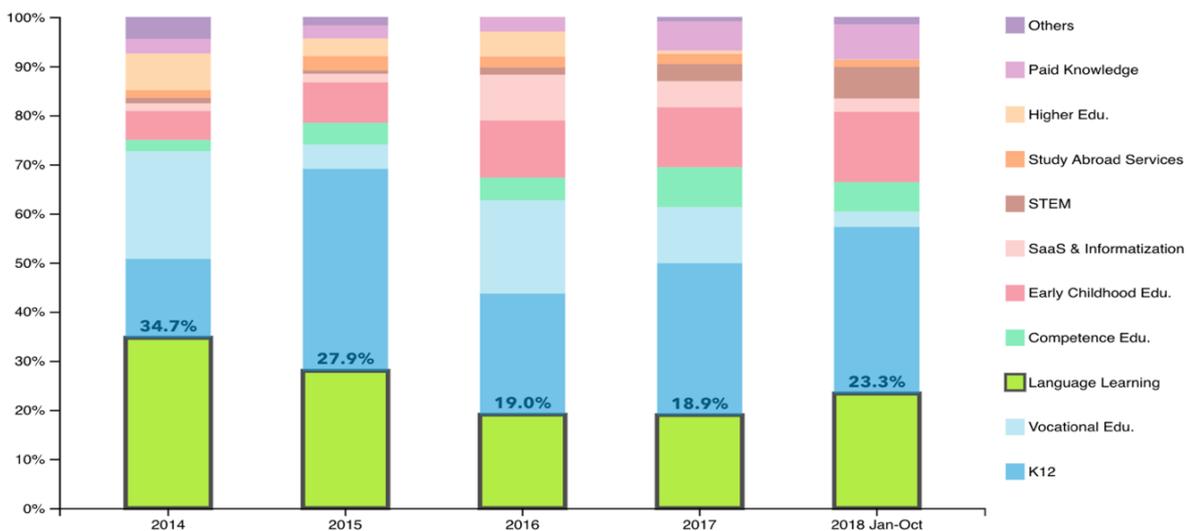
Figure 16. Funding amount of K12 sub-market in China



Source: JMDedu, retrieved September 10, 2019, from <http://getchina.jmdedu.com/Data/China%27s%20Edtech%20Investment>.

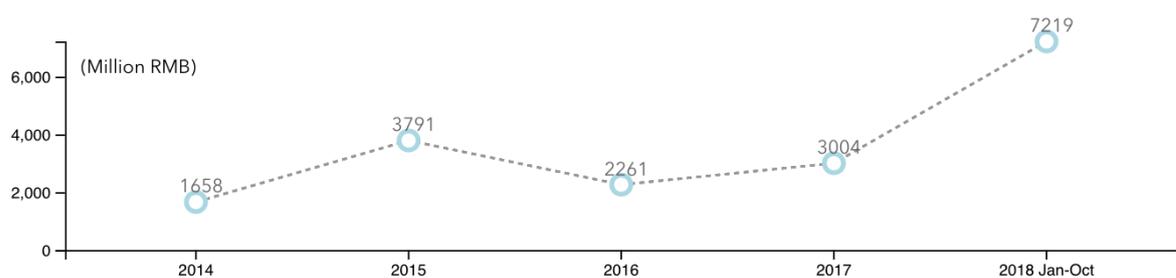
The second investment trend in 2018 is online foreign language studies for children, as it is believed to open many new opportunities for them (JMDedu, 2018). The JMDedu agency states that around half of the financed companies were again related to one-on-one tutoring, but also to one-to-many teaching and training institutions or public schools, all done by foreign teacher’s live broadcasts. Naturally, the most often taught foreign language is English. A few examples of companies in this trend are VIPKID, iTutor and DaDaABC (Zhang, 2019). The share of language learning sub-market and the deal amount might be seen below in the figures 17 and 18, respectively.

Figure 17. Investment share of language learning sub-market in China 2014-2018



Source: JMDedu, retrieved September 10, 2019, from <http://getchina.jmdedu.com/Data/China%27s%20Edtech%20Investment>.

Figure 18. Funding amount of language learning sub-market in China



Source: JMDedu, retrieved September 10, 2019, from <http://getchina.jmdedu.com/Data/China%27s%20Edtech%20Investment>.

The last trend is STEM education. Interestingly enough, in 2017, the hottest track was sports. Especially in terms of financing amount, sports reported the highest growth of total funding within this trend and was followed by music and literacy.

2.4. The Ecosystem and know-how

2.4.1. EdTech hubs in China

In the „Project Ecosystem 1.0” report, Navitas Ventures, which is the education venturing arm of Australian global education provider Navitas, analyzed 20 different cities around the world to summarize and identify the most EdTech-friendly ecosystems (Navitas Ventures, 2018). The Head of Navitas Ventures, Time Prail, expressed that the intention behind this project was to capture best practices and help Global EdTech community collaborate more easily. The report is especially valuable, as the EdTech definition used in it was strictly limited to companies that are “innovative adopters of technology”. Estimates showed that this definition fit around 25,000 companies worldwide and exclude such giants as TAL Education Group, New Oriental and Pearson. Taking into consideration the size of these giants, this approach allowed to explore the young scene of emerging EdTech companies in these hubs. The chosen cities represent the full range of EdTech diversity worldwide, have different levels of maturity and are home to 40% of global EdTech sector. The authors did not decide on analyzing the 20 largest ecosystems, because the report would have been dominated by cities in US and China and therefore narrow the diversity.

The results of the analysis, which was made using both data-led approach and on-ground intelligence from 80+ EdTech investors, founders and community leaders, were presented by

a self-developed EdTech index score for each city. The greater the result, the more EdTech-friendly ecosystem the city has. The dimensions taken into consideration were the number of EdTech companies, funding, incubators, government support and connection to the local education sector, which might be seen in the table 4 below. To capture the importance of each dimension, authors used weighting scores.

Table 4. Descriptions of dimensions in Navitas Ventures’ „Project Ecosystem 1.0” report

Dimension	Description
Companies	The breadth and depth of the EdTech landscape
Funding	The availability and sources of EdTech capital
Community	The maturity of the EdTech community (e.g. incubators)
Support	The level of government and education support and innovation potential of the city
Test bed	The quality, size and accessibility of the local education sector

Source: Navitas Ventures, retrieved 15 July, 2019, from https://www.edtechcities.com/pdf/NAVVEN180628-1212%20Report_WEB_FINAL.pdf.

The ranking was dominated by three places in that order – Beijing, Bay Area and New York, which might be seen in the figure 19 below. These places, which final scores were different by just 3 out of 100 possible points were named “Global leaders” and present three different strategies for EdTech development, which I will elaborate on a bit later. Next three cities with similar scores, which were identified as “Challenger cities”, were Boston, London and Shanghai. The report indicate that they are recognized for incorporating globally respected collaborations, highly rewarded events, specialist accelerators, close integration with traditional education players and are most likely to challenge for the top spots with their supportive EdTech ecosystems. The rest of 14 locations was called an “Emerging cities at different stages of maturity” group and is expected to continue to mature and provide more complete support for EdTech development in future, but currently lies significantly behind the previous two and should adopt best practice from them.

Figure 19. Ranking of EdTech cities in Navitas Ventures’ „Project Ecosystem 1.0” report

		COMPANIES FUNDING COMMUNITY SUPPORT TEST BED					EDTECH INDEX ¹	
								
		Weighting ² (maximum score)	30	30	15	15	10	100
Global leaders	1	Beijing	30	26	14	13	6	88
	2	Bay Area	26	30	10	14	8	86
	3	New York	26	24	15	12	9	85
Challenger cities	4	Boston	23	17	15	14	9	76
	5	London	23	17	15	11	8	72
	6	Shanghai	21	20	10	11	7	68
Emerging cities at different stages of maturity	7	Bangalore	23	17	8	7	5	58
	8	Paris	20	12	11	9	6	58
	9	Tel Aviv	20	9	13	11	5	57
	10	Stockholm	18	9	10	14	6	56
	11	Singapore	18	8	10	11	7	54
	12	Berlin	15	12	10	10	6	53
	13	Toronto	17	11	9	9	6	51
	14	Delhi NCR	20	14	7	5	6	51
	15	Sydney	17	6	8	9	6	45
	16	Tokyo	11	9	7	11	6	42
	17	Kuala Lumpur	11	6	6	8	6	37
	18	Nairobi	14	6	9	5	4	37
	19	Cape Town	14	6	8	5	3	35
	20	Sao Paulo	12	6	7	5	4	33

Source: Navitas Ventures, retrieved 15 July, 2019, from https://www.edtechcities.com/pdf/NAVVEN180628-1212%20Report_WEB_FINAL.pdf.

According to Navitas Ventures, the winner of the ranking, Beijing, is a great example of domestic champion, that dominates EdTech sector within the country. It is home to over 3000 EdTech companies, which makes it a city with the highest global concentration of EdTech

companies per capita and provides access to early-stage capital that help companies expand rapidly and capture the enormous domestic market first. The local government and strategic incumbents such as Tal Education Group and New Oriental, which have their headquarters in Beijing, play key role in supporting this ecosystem. Moreover, according to comment by Chief Executive of Navitas Ventures, Tim Prail, even though Bay Area in the US had become a global center for VC and tech businesses, China's population impacted Beijing's first place in the ranking (Crace, 2018). "The one thing [the US] doesn't have is a population of a billion people. And when you look at China, China has a population of over a billion people, and they spend a significant percentage of their personal wealth to access quality education," he said.

When it comes to the Bay Area, its strategy for EdTech development is focused on international export. The location provides access to seed funding, technical expertise and market access to build a category-leading global product in a short period of time. Therefore, companies are globally focused from day one, in spite of large domestic market. The New York, on the other hand, is a world's leading example of an EdTech hub that provides EdTech companies with funding, customers and highly supportive environment, so that they can reach scale without leaving the city. The authors of the report underline that the gap between "Global leaders" and other locations will only widen, because the next generation of EdTech entrepreneurs will move to cities that offer the best ecosystem for the development of their businesses.

2.4.2. Biggest companies and their know-how

As beforementioned, China is home a great number of education giants. Six years ago, only two of the world's largest fifteen education companies were Chinese (Consultancy.asia, 2018). In April 2018, the number has already increased to ten and the two companies with the highest market capitalization are both Chinese – TAL Education Group and New Oriental Education & Technology Group, number one and two globally, respectively. Their businesses offer quite diversified education services, but their main focus is physical after-school tutoring and language learning, which is what accounts for the biggest share of Chinese parents education spending and what explains the success of both companies (Zhang, 2019; Lynch, 2019). Even though their market capitalization is \$18.9 billion and \$16.6 billion respectively, together they have less than 4% of China's after-school test preparation market share (Zhang, 2019). Both of them play a key role in helping EdTech companies scale and China has already developed a significant number of large EdTech businesses, including a few unicorns. The fact that both

TAL and New Oriental, as well as other China's tech giants often called BAT (Baidu, Tencent and Alibaba), invest in growing EdTech companies a significant amount of money has a great importance and influence on EdTech ecosystem in China.

2.5. Government support

Over the past years educational technology companies in China have benefited significantly from the government policies and reforms. Support for education and amendments of private education-related laws had a positive effect the growth and development of products in this sector (Zhang, 2019).

To start with, almost every year since 2010 the government has increased its percentage of GDP spend toward education, in line with the increase in the government wealth (JMDedu, 2018). Since 2012, expenditure on education represents over 4% of China's GDP. This raised the education sector to one of the country's most important economic pillars (Lynch, 2019).

Second of all, China's government introduced two strategic plans towards the development of education in the country. First, 13th Five-Year-Plan, was introduced in 2016 as another series of social and economic development initiatives that map out China's strategies for growth in a five-year period, issued since 1953 (Zhang, 2019; China Daily, 2015). Key goals in this plan are to “modernize education, to provide greater opportunities for lifelong learning for all citizens, to increase the education quality in all aspects, to improve the abilities on talent delivering and higher education innovation, and to have a more mature education system” (JMDedu, 2019). Moreover, one of priorities in this plan was the “cultivation of students' entrepreneurship and innovation capabilities and practical skills”, which shows the deep understating of China's government in the need of students who can “ideate, create and compete in a global economy” (The State Council of the People's Republic of China, 2017; Wan, 2017). The plan aimed to invest \$1.07 billion in EdTech startups in 2015 alone (Lynch, 2018).

Second plan was announced by Premier Li Keqiang in 2017 as Modernization of China's Education by 2030 (Zhang, 2019). The goal was to focus on increasing investment in advancing education systems through learning space innovations, learning methodology innovations, curriculum redesigns, organizational restructures and the adoption of new IT technologies in

learning and teaching (Zhang, 2019). This strategy is expected to leverage new technologies and improve the delivery of education and modernize the nation's education sector (Geromel, 2019).

When it comes to the digital transition in education and learning, China's government has been increasing the budget in Information and Communication Technologies (ICT) and EdTech, which in 2015 reached approximately USD40 billion (RMB275 billion). At the same time, it has been introducing policies to speed up the development of ICT infrastructure, broadband Internet connections, Cloud LMS, Ed-SaaS and EdTech products adopted in schools. As a result, more than half of the schools in China were provided broadband coverage, multimedia classrooms and online learning space in 2015 and is planned to reach almost all schools in China. In first-tier cities, the coverage has already achieved 99% (JMDedu, 2017).

Other initiatives here are reforms of gaokao, the university entrance exam, as well as high school curriculum. In the past four decades, the gaokao system was continuously reformed to meet present-day realities. In general, the exam is believed to have changed the lives of tens of millions of people and to be important for China's rapid economic growth, and modernization, as it opened up China's education since it was resumed in 1977 (Xinhua, 2018). Latest reforms made studying English even more critical, which opens new opportunities for EdTech companies focused on language learning. The reform on high school curriculum will make STEAM courses compulsory in high school, which is great news for EdTech companies delivering STEAM products (Zhang, 2019).

Many other government initiatives include for instance a construction of the MOOC Times Building, which is a 22-story tower dedicated for EdTech startups offices (Zhang, 2019). The building is located in Beijing's startup district, Zhongguancun, which is informally called "The Silicon Valley of China" and is located right next to two top Chinese universities – Peking University and Tsinghua University.

2.6. Innovation in China's EdTech

Is China's EdTech market really innovative? What is exactly behind this innovation? During the interview with Professor Jeffrey Towson, I asked him about the most innovative EdTech market in the world and how would he position China in comparison to other countries.

“This is where you have to sort of break it in the college and pre-college. Once you go to the higher education, the west is much better. But everything pre-college, I haven’t looked in every country, but I would put China as the top. Their spending is the highest, people are most aggressively involved in it. Parents are hugely focused on it. I would suspect it’s China, but I don’t have any data to back that up. You might also look up at countries like Singapore or Taiwan. It might be pretty great there too. But definitely, China will be in the top three” (Towson, 2019).

This answer clearly states that China is innovative and ranks top in the world. Furthermore, according to Professor Towson, the innovation in Chinese EdTech market is happening primarily in the pre-college area and the west is still better in higher education. Indeed, when it comes to the sector and geography focus, China’s largest EdTech companies operate primarily in the domestic K-12 sector, after-school tutoring, test preparation and English language learning markets. On the other hand, the largest USA-based EdTech companies direct a great deal of attention to higher education and lifelong learning. The USA market itself serves them as a platform for international expansion (Navitas Ventures, 2018).

Paweł Czech, the Vice President of NUADU, confirms that China is an innovative EdTech market and explains the main reason it has a great potential to be such. „The main driver of innovation in China is the need to use new technologies to improve the quality of education on a massive scale. The technology is an equalizer of chances of all students to access high quality education,” he said (Czech, 2019).

Technology plays a crucial role in increasing access to education in China. The country is diversified when it comes to quality of education systems. First-tier cities, which are Beijing, Shanghai, Guangzhou and Shenzhen, provide high-quality education. However, over 1 billion citizens living out of these cities have limited access to China’s top institutions and these are the fastest growing regions in the country. Technology has become a significant equalizer that allow these people, who also aspire to study in country’s best universities, to access better quality education and improve their chances (Zhang, 2019). There is a massive opportunity for EdTech products to fulfill a huge demand from lower-tier cities for quality education at affordable prices. Moreover, together with the development of technology the eagerness to accept new educational methods is also increasing which creates is a promising combination for EdTech companies (Lynch, 2019).

When asked about things behind the innovation in China's EdTech, Jeffrey Towson answered from two perspectives, depending on the definition of the innovation. He concluded, that both the consumer spending and the consumer-centric approach of Chinese companies are factors of the innovation in China.

“The problem with innovation is that nobody really knows what it means. There is no really a clear definition for it. If you look at spending, then I think China is probably number one for private education spending before college. If you look at language education, I'm almost sure they are number one, because everyone is studying English. So, on the spending side I would probably put them a number one, I have to check but I am pretty sure. If you consider innovation as a sort of customer-centric innovation, which is what Steve Jobs did – he didn't invent anything, but he did find clever ways to put things together to make it more customer-friendly and interesting, definitely they are pretty good there,” he said (Towson, 2019).

According to Professor Towson's answers, both the supply and demand side drive new products and services that can fulfill the education needs in China. To analyze deeper the new products offered by China's EdTech companies, I decided to look on new, emerging companies, often called startups, and established firms, which are present on the market for tens of years.

2.6.1. Innovative emerging players

Many new companies have emerged in China's EdTech sector, which proposed completely new digital business models and offered new value propositions for customers. Some of these firms have already become unicorns and/or made an IPO, and they keep growing their businesses further. In particular, a great number of companies have developed their products in the area of language learning.

“There is a lot of companies focused on using digital tools to either create new business models, which would be Liulishuo, 51talk and VIPKID. Those are all purely online business models. Some of them are just connecting teachers from Philippines with students, it's just online one-on-one education. Then Liulishuo is trying to replace all education with AI and study groups. No teacher” (Towson, 2019).

All three companies mentioned by Professor Towson are delivering language learning products but are doing it a bit differently. Both 51talk (full name China Online Education Group) and VIPKID connect children with teachers for the real-time one-on-one online English classes. 51Talk takes its teachers from Philippines and VIPKID from with North America (VIPKid, 2019). VIPKID offers personalized learning, as it believes education is not one-size-fits-all and each student is unique. Currently, the platform connects over 500,000 paying students from China and 35 other countries with over 60,000 teachers in the US and Canada. Every day, 180,000 classes are taking place and lasting 4.5 million minutes. The company has already managed to raise US\$825 million and sign a strategic partnership with Microsoft to further develop its products using Microsoft AI infrastructure (Zhao, 2018). Moreover, it already has announced its plans to expand its operations to 100 countries and set up branches in 10 cities globally, including Seoul, Tokyo, London, Singapore, Madrid and Buenos Aires in the next three years (Yu, 2018). VIPKID is an example of a company that has introduced an innovative online human-teacher-based model, which has definitely made teaching service more personalized and focused on an individual, as well as available anywhere and anytime because it's an online platform. Moreover, even though it transformed the way of learning a language from offline to online, it didn't exclude the valued human teachers in this process. To put into perspective the spectacular growth pace that VIPKID has had, it needed just four years to exceed US\$ 5 million in revenue, while for TAL and New Oriental it took 13 and 18 years, respectively (JMDedu, 2018).

Another company which offer a similar product to VIPKID is DaDaABC, but the company does not require their native English teachers to have a North American accent like its rival. The company has already earned several awards and recognitions, as well as collaborated and partnered with such companies as Baidu, Tencent and American TESOL Institute (ATI). Thanks to the partnership with the latter, DaDaABC offers online training courses for English instructors worldwide (Malmsten, 2019).

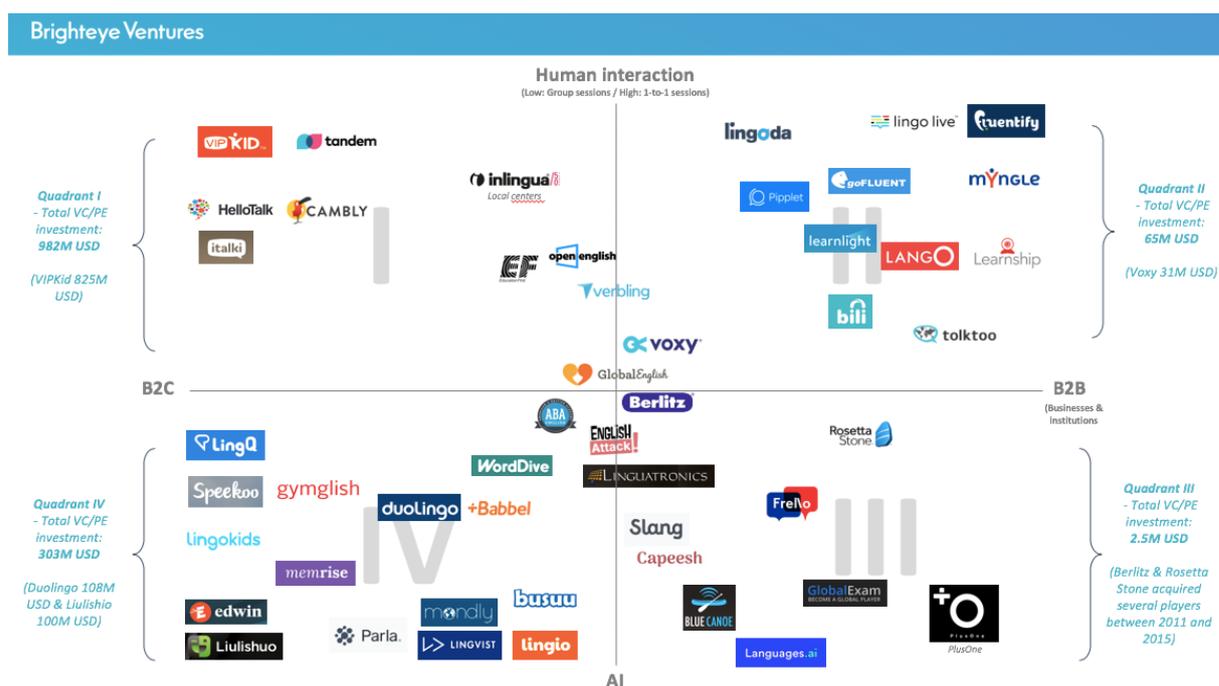
An example of a company which tries to revolutionize language teaching in China using a different approach is LAIX, which is an AI company that provides online English learning services through its mobile application called Liulishuo (Liulishuo, 2019). The company's technology is based on its AI English teacher, which is built using deep learning and adaptive learning technologies, as well as big data. In June 2018, the company reached 80 million registered users and was named on the list of "50 Most Innovative Companies" for 2018 by

Forbes China. What is more, CB Insights named it as the only Chinese company out of the two in the education category globally on the list of “The 100 Most Promising Private Artificial Intelligence Companies in the World” for 2018. On September 27 in 2018, the company did an IPO in on the New York Stock Exchange and raised US\$72 million with a price US\$12.5 per share (Liulishuo, 2019).

In contrast to the beforementioned players, Shanghai-based Liulishuo developed what it claims as the world’s most advanced AI English-teaching system that is made available through a smartphone app, which now has more than 70 million users in China and 175 countries around the world (Tao, 2018). iResearch Report, prepared on demand for LAIX, called it as the first AI English teacher that can customize teaching content based on users’ results and provide one-on-one personalized teaching, as well as customized interactive courses, which is more than just applying AI to grading or voice recognition. The company itself explains the benefits of its technology as personalization, efficacy and accessibility, and believes it can solve the pain point of shortage in high-quality human teachers in the industry. LAIX says that it transformed the language learning process from teacher- centric model to student-centric model, as it enables students to experience a self-adaptive learning with content optimized for their needs and interests (LAIX Inc., 2018).

A VC fund Brighteye Ventures in 2018 prepared a Language learning solutions market map, on which they located over 45 companies to better navigate the space of language learning landscape (Brighteye Ventures, 2018). The matrix vertical shows if the company is more B2C (individual users) or B2B (educational institutions and corporates) business and the horizontal of the matrix shows if the company is providing the user with more human interaction (group and private face-to-face and/or online meetings) or AI-technology (i.e. adaptive learning, platform, VR/AR). The result of this mapping clearly shows that both of beforementioned companies, VIPKID and LAIX, are very specialized in their activities and deliver the most extreme version of the type of product they offer. Moreover, both of these companies scored top two VC financing rounds among all of mapped companies. The Language learning solutions market map might be seen in the figure 20 below.

Figure 20. Language learning solutions market map by Brighteye Ventures



Source: Brighteye Ventures, retrieved 5 August, 2019, from <https://www.brighteyvc.com/single-post/2018/08/16/Language-learning-solutions-market-map-August-2018>.

The model of one-on-one streaming has quickly become a very common concept in China’s market. It started being used in teaching everything from language to math, coding and music. In China, an even larger market than language learning is K-12 supplementary learning and there are companies that decided to take advantage of it, even though it is the top source of revenue for both Chinese giants TAL and New Oriental (Lynch, 2019). Some examples of such companies are Zhangmen and Yuanfudao.

Zhangmen offers after-school customized one-on-one tutoring for the K-12 students provided by top teachers in the country, who are graduates of China’s top universities such as Peking, Tsinghua, Fudan, Zhejiang and Shanghai Jiao Tong. The company provides each student with a program of one-on-one tutoring sessions by different professional teacher. This includes taking the student through every step in the service chain, from trialing the class, to course selection, completing the course, taking the required tests and providing feedback one the course is completed (PR Newswire, 2019). Moreover, the course selection is not limited to school courses. At the end of 2018, Zhangmen launched Zhangmen Peilian, an art education

courses to improve children's learning ability of playing instruments like piano and violin and stimulate their musical interest (Zhang, 2019). In 2017, the company's turnover reached RMB1 billion, which was 70% share of country's online K-12 one-on-one tutoring market and the Zhang Yi, the CEO, was included in Forbes' China's 30 Under 30 list that year. In 2018, the company had about 40,000 tutors and 3 million registered students from 600 cities in China.

Zhangmen's competitor, Youanfudao, also has a platform with live courses for K12 students in China, but also offers a database of exam problems through its product Yuantiku and a popular homework help app (Liao, 2019). The company offers a comprehensive curriculum covering almost all subject courses in primary and secondary schools and a large pool of national renowned teachers which students can access via live online tutoring at home (Malmsten, 2019). Yuantiku, which is an exercise database that provides content of previous year's examinations for students, offers computer and smartphone-based exercises and based on the level of knowledge the student has it can provide tailored exercises to improve the effectiveness of studying. The company's homework app allows students to scan homework problems and solves them instantly with the snap of a camera. Moreover, the company operates a research institute for AI, so that the homework app could be smarter. Yuanfudao claims to have more than 200 million users with more than 1 million paid users. According to said Gordon Ding, Managing Director of Warburg Pincus that invested in the company, unlike the offline resources intensive traditional tutoring model, thanks to easy access and high effectiveness of teaching, online learning is becoming a primary choice of Chinese families.

Other companies with similar homework help services include Zuoyebang, the biggest competitor of Yuanfudao, and 17zuoye (Liao, 2019). The first one is a mobile study platform targeting K-12 students, which provides a comprehensive study tool for schoolwork search, efficient practice, learning and discussion (Sequoia Capital, 2019). It started as a Q&A website, but now also offers a platform, where scholars can seek answers to study-related problems and a supply method to peers who are trying to find assistance. The company offers question banks and tutoring. So far, it is a China's EdTech unicorn which raised the most capital of over US\$1 billion with the last financing round raising from SoftBank in the size of US\$500 million.

The innovation that both of Yuanfudao and Zuoyebang came up is a simple idea of a "question item bank". Based on all the published worksheet and exam questions, these companies created enormous free databases with correct solutions for them. As a result, students can use their

products to search for the right answer for almost every question they might face in school or while doing homework. Moreover, the image recognition technology made the search itself an incredibly simple process as well. Students just take a photo of the question and the mobile application immediately gives them the answer. Another value added for users was added in connection to their learning habits. Through analysis of huge databases of learning behaviors, Yuanfudao and Zuoyebang could train their algorithms to offer personalized recommendations. As company must generate revenue to survive and grow, the use of Big Data and AI turned out to play here a key role. The companies attract users by their free tools of question banks and image search and then offer them paid services in the form of personalized online classes and online one-on-one tutoring (JMDedu, 2018).

17zuoye, the abovementioned homework help service company, is another example of an interesting business model with an innovative product. The company offers a digital homework platform for students, parents and teachers, which allows them to interact with each other online. The aim of the platform is to improve learning efficiency and transform student homework from offline to online. To do so, the company built a database for homework, that thanks to the speech recognition technology can help teachers assign digital homework. Moreover, it can grade homework automatically and generate analytic reports. Through the platform, students can finish their homework and access supplemental education, while parents can view the reports of their children performance. As previous two companies, 17zuoye uses similar idea to generate sales. It attracts large number of users by free digital homework product and then offers them premium content or online tutoring. As of February 2018, it served over 60 million users, including teachers, students and parents, as well as 120,000 schools.

According to Tom Mitchell, professor of Carnegie Mellon University, "Education in the next ten years will be AI-driven" (Cao, 2019). Huang Yan (黄琰), CTO of TAL Education, pointed out the importance of the role of AI in education: "Besides the traditional three roles in education (teacher, child and parent), AI is becoming now the fourth role" (Cao, 2019). In the beforementioned examples of EdTech companies, AI is widely used as an enhancement of companies' services to add value for customers. However, none of these companies focus primarily on AI as a product. As it turns out, one of China's biggest and most promising AI startups, Megvii, also known as Face++, which raised over US\$1.35 billion and reached a valuation of US\$4 billion, decided to enter the domestic education market with a live image

recognition product (Azevedo, 2019). Company's technology is used in online learning to assist teachers and help identify students' emotions, such as engagement and confusion, and recognize gestures (Holon IQ, 2019). Moreover, it developed a combination of AI and the Internet of Things and started working on the "Smart Campus" project. When applied, the AI-powered system is planned to assist with students' impressions analysis, improve traffic efficiency in campus' places like libraries and dormitories, introduce AR teaching and identify strangers on campus to protect students' safety (Face++, 2019).

Another interesting area when it comes to China's innovative EdTech companies is STEAM. Makeblock, which has become a global leader in STEAM education solutions (Malmsten, 2019), is a Shenzhen-based startup founded in 2013 that sells do-it-yourself (DIY) robotics kits for children to assemble and then code through its programming learning platform in order to control the robots (Makeblock, 2019). Thanks to these processes, it is teaching kids coding, engineering, and other basic AI technologies. The company claims to already sell its products to over 8 million users worldwide in more than 20,000 schools and 140 countries, including AltSchool, a Silicon Valley education start-up backed by Mark Zuckerberg (Geromel, 2019). Makeblock has already been titled several times. In 2018, it won seven international awards, including the International Design and Excellence Award, the Reddot Design award, and the CES Innovation Awards. With its US\$80 million VC funding, Makeblock is an example of a company with great potential to surf the global wave of movement to teach children STEAM abilities and might start the period of Chinese EdTech companies expansion to global markets, which some people believe will start soon (Geromel, 2019).

2.6.2. Innovative established players

While talking about the Educational Technology scene in China, Professor Towson pointed out the innovation implemented by established Chinese giants. As beforementioned, China is home to the world's two biggest education companies when it comes to the market cap. They wouldn't achieve their size without the pursuit of innovation and improving their services and products. In particular, TAL and New Oriental focus on adding online capabilities to their offline portfolio of products, very often through M&As.

“And then you can look at established players like TAL Education and New Oriental. Those are traditional, in person, local teaching centers and they are adding online capabilities. That’s pretty interesting. I think that TAL Education is probably the most aggressive. They are doing a lot of M&As on the digital side and trying to complement their physical locations. I suspect that’s probably what is going to work out the best is a hybrid between this off and online. I think that one of the problems with the replacing teachers with just software is that it is primarily the argument for convenience and cost savings. And that’s not what parents care most about. What they care the most about is quality. And then after quality convenience and then cost savings. Until those purely online creatures show that they deliver the same level of quality as a down screen physical one, I don’t think that parents are going to trust them. Quality of your kids’ education is more important than the price. So, they have to prove themselves quality-wise still. The established physical players like TAL and New Oriental, they don’t have to prove themselves when it comes to the quality. I suspect those are going to do much better. I think TAL is the most aggressive in terms of what they are doing. And I suspect that’s probably the near future. It is not replacing teachers; the near future is augmenting them, giving them digital tools and making them more effective and productive, but I don’t think it is replacing teachers. It’s much harder to go from online to offline than vice versa. If you are going from online to offline you have to open up teaching centers in tens of cities and the companies that have done that like TAL and New Oriental, it took them years. I think it took TAL 15 years and it took New Oriental like 25 years. It takes a long time to open centers, hire the teachers, fill the classrooms. So, I don’t think the online players are in position to do that and I don’t know if they want to do that. So, I think it will be from offline to online, but we’ll see” (Towson, 2019).

Indeed, TAL Education Group is taking a lot of effort to improve its competitiveness. One of the areas for innovation is introducing Artificial Intelligence (AI) to education products and services. Nowadays, China is competing with the USA to become the world’s leader in the development of this technology. TAL has also made a few steps to contribute to this race. In 2017 it established the “AI Lab”, which is the "Tsinghua University-TAL Intelligent Education Information Technology Research Center" in cooperation with the Computer Science Department of Tsinghua University dedicated to work on creating smart classes based on artificial intelligence technology (PR Newswire, 2017; Zhang, 2017). By 2019, this lab also cooperates with Stanford University and is working on the application of computer vision, voice processing, natural language processing (NLP) and other, all in education sector (Cao, 2019). In July 2019, during 2019 TAL AI Summit, the company presented an AI open platform that

feature AI-aided class, AI guard, homework-correcting and question-searching solutions and its technologies were tested and improved in TAL's own classes.

TAL's biggest competitor, New Oriental, remains competitive and tries to keep up with the implementation of AI technology into education. In July 2018, it established an AI research institution called NAIR and in October it released an AI education product which has similar functions as TAL's AI-aided class (Cao, 2019).

In 2017, one of TAL's visions for the next 10 years was to "transform from a tutoring company to an education company and that means going from offline business to an online, blended model enabled by technology", according to Winnie Xie, Head of International Investment and Business Development at TAL (Wan, 2017). At that time, its online tutoring services accounted for less than 5 percent of revenue, but the company has already invested in several U.S.-based EdTech startups that offer online products, such as Enuma, Knewton, Minerva Project, Ready4 and Volley, to integrate them with its own online offerings. Moreover, TAL is a limited partner (LP) in Reach Capital, a California-based VC fund that invest in educational technology solutions (Wan, 2017). As of 2017, the fund made 26 investment in US-based startups. As of 4 September 2019, the fund made 49 investments in total (Reach Capital, 2019). In addition to direct investing and LP position in a VC fund, TAL does acquisitions, also in the USA. In 2018 it acquired Dr. Panda and CodeMonkey Studios, which both work on educational games with CodeMonkey teaching computer programming to children through them (Capstone Headwaters, 2019). In 2019 it acquired Ready 4, which offers a mobile study app that helps students to prepare for the GMAT.

One of effective implementations of the hybrid online-offline model, is TAL's "double teacher classroom", which can enhance pupils' learning experience by improving their education efficiency (PR Newswire, 2017). The speech evaluation technology under TAL's sub-brand ABCtime can help evaluate students' performance and provide personalized feedback. For example, after the teacher asks a question for students to answer, with the use of AI and big data, the system evaluates students answers and immediately provide personalized feedback for each student whether the answer was right and if it could have been better. The development of TAL's AI offerings might be seen in the figure 21 below, where the image recognition technology detects and counts the time students spend on different activities.

Figure 21. TAL's AI educational product with image recognition function



Source: JMDedu, retrieved 20 September, 2019, from <https://medium.com/@EdtechChina/chinas-top-two-education-players-unleashing-the-full-potential-of-ai-related-initiatives-15a92046140f>.

2.7.Risks and uncertainties of China’s EdTech

Every type of business is vulnerable to certain risks. No different is education in China, especially in the times of geopolitical tensions and ongoing trade war with the USA. However, when asked about potential risks, problems and uncertainties in China’s EdTech future, Professor Towson as the biggest one points out the regulations and particularly, he mentioned two aspects. First one is the education content and the second one is the conflict of the in-school versus after-school education.

“The biggest one is regulation. It is not certain that the government likes this at all. (...) The parents want it, but it is unclear if the government does and the education sector in China is highly regulated. Now if you are doing something like language learning there is a lot less to do. Keep in mind that the government doesn’t just regulate that you must be credential, but the government cares about what the actual content is. That it reflects certain values. Now if you are doing language, there is a lot less in that because it is just language. If you are doing mathematics, okay. But a lot of this education is going to fall into a curve view of what the

government cares about. They care about this stuff. So those are probably the biggest one, and I think that people are underestimating, that there are a lot of misgivings about the government on how much this private education should be happening. And if there are educational needs, why they are not happening in the public schools. (...) The other thing to keep in mind is that a lot of regulations are about what the teachers are allowed to do. For the longest time if you were a doctor and you had a job at a public hospital you couldn't work anywhere else without their permission. Your medical license wasn't tight to you but tight to the hospital you were working. So, I'm pretty sure the new regulations that came out on teachers limit what they can do outside of their primary teaching. Now, that limits the pool of teachers dramatically, if public school teachers are not allowed to do this or are very limited on what they can do, which I think is the case. So, there is regulations on the content, there is regulation on how many hours can be spent and then there is the regulation on the labor. Highly regulated sector in China" (Towson, 2019).

With no doubt, the regulations in China can change quickly and the businesses that don't adjust might disappear from the market promptly. Education is significant and strategically important area of China's government focus, which makes this matter very crucial to bear in mind.

The second biggest threat according to Professor Towson is the low quality of products that try to replace teachers instead of supporting them. If these ideas turn out to deliver lower quality of education that actual solutions with teachers as the lead, they might not be able to stay on the market and find customers.

"Number two is that I think a lot of the currently online ones are unproven. If you are VIPKID you are basically taking real teachers and you are putting them online for students. You are just doing the classroom online, one-to-one. Okay, that's fine. 51 talk is the same way. But if you are starting to replace teachers and all of this, it may not be very effective. There is a lot of uncertainty in the product quality once you remove teachers and that's Liulishuo and a few others that are doing it. Those are probably the two big ones" (Towson, 2019).

Another threat might be the access to the capital for further development and expansion. According to Financial Times, VIPKID and Megvii are struggling to raise more funds (Lucas, 2019). The rise and fall of the bike ride-sharing economy in China, questionable business models and high valuations of Chinese startups, as well as the trade war, which has showed the weak spots of many Chinese companies, made investors more watchful. The money deployed

in China's IT VC deals declined in 2019 from its peak in 2018. The aggregate deal value in the second quarter of 2019 recorded a huge ten-fold drop from US\$26.4 billion in 2018 to US\$2.2 billion. So did the aggregate deal value of investments in Chinese AI, which dropped nearly fifteen-fold. In the end, Megvii completed its US\$750 million Series D financing round in May 2019 with state-backed entity, Bank of China Group Investment, as lead investor, but also managed to attract Alibaba and foreign investors of Macquaire Group and Abu Dhabi Investment Authority (Megvii, 2019).

Moreover, a threat for online B2C education companies in China is the fierce competition, which makes the cost of consumer acquisition to rise and profits to drop and might herald an oncoming consolidation period. According to Toby Mather, co-founder and CEO of Lingmi, which is an online education business operating in the UK and China, "We are entering a B2C acquisition winter unless you have a genuine network effect like Instagram and Facebook" (Lucas, 2019). This matter, connected with the drop in invested capital, poses a question for companies' executives whether they should focus on growth and keep their spending or show that they are cash positive, but grow only a few percent a year. Even though there might be difficult times approaching for EdTech companies, there are many arguments that the businesses will keep developing. According to Shirley Xie, the leader of PwC consulting in China and Hong Kong "The talent is here. The motivation is here. And the demand is definitely here" (Lucas, 2019).

Professor Towson also shows a positive perspective on the matter. He explains that education is not one of the sectors vulnerable to the trade war and macro conditions should not make an impact here.

"The VC money moves in waves to certain sectors. Bike sharing was super-hot 2 years ago. Digital health was crazy popular like 2016 and then it cooled and moved to other places. So, I would expect there is also an EdTech wave, but I don't know where it is within that and I don't suspect these macro factors will impact active VC money.

Education is a purely domestic business. Certain businesses are good by the trade thinking because they are in that business, like manufacturing. You can see manufacturing money slow down because nobody knows how rough the trade war is going to be, but education is pretty domestic. Local students, local teachers, local money. I would be surprised if that was impacted by the macro situation" (Towson, 2019).

Li Chao, an analyst at Huatai Securities, support Professor Towson's statement. In South China Morning Post article, he said that "many families are willing to pay a lot of money for education and related services such as tourism and entertainment" (Cai, 2018). Moreover, the newspaper came forth with official data that since 2013, spending on education, culture and entertainment, medical care and health has risen steadily in China. However, at the same time food, tobacco, alcohol and clothing declined. This clearly shows that parents prioritize education spending, but limit other areas, which the Chinese government counts on to stabilize economic growth (Cai, 2018).

3. EdTech investors

3.1. Who is investing in EdTech?

There are plenty of investors interested in EdTech, however their activity varies around the world. In the Global EdTech Ecosystems 1.0 report, between 2015 and 2017 Navitas Ventures analyzed over 1000 funding rounds of EdTech companies headquartered in 20 cities around the world. As it turns out, companies located in only four cities, two American and two Chinese, attracted about 83% of total invested capital. Beijing-based companies raised a stunning amount of US\$2.2 billion and were followed by Bay Area, Shanghai and New York- based companies that raised US\$1.9 billion, US\$1.4 billion and US\$0.9 billion respectively. Together with Bangalore, London, Boston, Berlin, Tel Aviv and Toronto-based companies, they attracted over 99% of the total capital, which clearly shows the uneven distribution of investors focus around the world. Furthermore, over 50% of capital was raised in Series C+ series, while it accounted for only 7% of the total number of deals. On the other hand, only 5% of capital was raised in seed round. According to Navitas Ventures interviewees, there is a shortage of early stage funding and many EdTech investors are only looking to participate in later funding rounds. Therefore, the role of accelerators and angel investors continue to be critical in funding the early stage EdTech companies in every analyzed city.

According to the report, the US is home to the most active EdTech investors. Only five of them, New Schools, 500 Startups, Learn Capital, Techstars and Y Combinator invested in 219 EdTech companies between 2015 and 2017 altogether. Moreover, there are many investors specialized in EdTech that made a notable number of transactions. The most noteworthy are New Schools, Learn, Rethink and University Ventures. All of the them were followed by many US headquartered industry agnostic investors, which is a proof of incredible availability of funding sources to EdTech companies based in the USA. In the Navitas Ventures report, only three US cities, the Bay Area, New York and Boston, were home to 1.5 times as many active investors as the remaining 17 cities altogether. This makes the challenge of investors accessibility to remain for the rest of the world. According to EdSurge, in 2018 in USA the most active investors were Learn Capital, Rethink Education, Reach Capital and Omidyar network, which made 42, 28, 22 and 21 investments, respectively. However, the investor that invested the highest amount of money was Owl Ventures – US\$ 93 million, which might be seen in the table 5 below.

Table 5. Numbers of deals for most active EdTech investors in USA in 2018

Investor name	Number of deals in 2018	Invested capital
Chan Zuckerberg Initiative	6	undisclosed
GSV Accelerate	14	undisclosed
Learn Capital	42	undisclosed
New Markets Venture Partners	15	US\$ 16m
Omidyar network	21	US\$ 24m
Owl Ventures	13	US\$ 93m
Reach Capital	22	US\$ 16m
Rethink Education	28	US\$ 30.2m
University Ventures	9	US\$ 15m

Source: EdSurge, retrieved 15 September, 2019, from <https://www.edsurge.com/news/2019-01-15-us-edtech-investments-peak-again-with-1-45-billion-raised-in-2018>.

Outside the US, there is very little specialist EdTech investors activity. The noteworthy exceptions are Paris with Brighteye Ventures and Educapital, London with Emerge Education and Beijing with Blue Elephant.

In China, a significant funding role in EdTech play strategic investment arms of the biggest education companies. The second key group are corporate funds of local tech giants. To no surprise, the most active education companies between 2015 and 2017 were TAL and New Oriental, which often times look for digital products to complement their portfolio of offline services. As for tech giants, those were Alibaba, Baidu and Tencent. Two other notable companies are Legend Capital, the investment arm of Legend Holdings, which is the owner of Lenovo Group, and Bytedance, which is the owner of a famous application TikTok and one of the most valuable unicorns in the world with valuation of US\$75 billion. Together with other active investors in China, they were the most generous and Shanghai and Beijing attracted the largest average deals size between 2015 and 2017. Chinese cities were followed by two American regions, the Bay Area and New York, with Berlin and Bangalore taking fifth and sixth place. However, there are not many investments done by industry agnostic funds in China's EdTech. The ones that actively invested between 2015 and 2017 are IDG Capital,

Sequoia Capital, ShunWei Capital and ZhenFund, however the latter was founded by two New Oriental co-founders Bob Xiaoping Xu and Victor Qiang Wang.

According to JMDedu, in 2018, Zhenfund, TAL and Blue Elephant Capital (Beijing-based China education sector's early-stage VC) were the three investment firms with the biggest number of investments in education companies in the China's Private Equity (PE) market (JMDedu, 2019; Blue Elephant Capital, 2019). The agency states that Zhenfund was number one with 20 investment cases and the VC firm GSR Ventures (Singapore-based firm focused on early-stage technology companies) reported the highest increase in number of deals in 2018, with a year on year growth from 2 to 10 (GSR Ventures, 2019).

3.2.Asian investors in the US EdTech market

A very visible trend among EdTech investors is that many Asian companies are looking for investments abroad, particularly in the USA. According to Victor Hu, Global Head of Education Technology and Services at Goldman Sachs' investment banking division, the reason behind it is that "investors, particularly in China, are looking across the Pacific to check out innovative tools and models that they haven't explored or implemented back home" (Wan, 2017). Clearly, these investors are looking for diverse products that will inspire and drive the innovation in their home market. According to EdSurge, in 2016 at least 10 U.S.-based EdTech companies attracted funding from Asian investors (Wan, 2017).

Furthermore, the situation is similar when it comes to US EdTech investors. According to EdSurge, almost every of the main Venture Capital firms have at least one investor from Asia as a Limited Partner. Some examples of such VCs are Fresco Capital, GSV Acceleration, Learn Capital, Owl Ventures, Reach Capital and Rethink Education (Wan, 2017). Previously mentioned Victor Hu explains that this way of investing is "an efficient, relatively inexpensive way for overseas investors to access the U.S. market." Moreover, it is a safe way of mitigating the risk across a portfolio of companies in comparison to investing in particular startups and does not require a knowledge of local markets. The table showing the participation of Asian investors in US-based companies might be seen below.

Table 6. Asian investors in USA-based EdTech companies

U.S.-Based Company	Funding Round (Series)	Year	Participating Asian Investors
Authess	\$2.2 million (Seed)	2017	EduLab
Brightwheel	\$10 million (A)	2017	GGV Capital
ClassWallet	\$1.5 million (A)	2016	Sinovation Ventures
EnglishCentral	\$1.3 million (N/A)	2016	Kirihara Shoten K.K.
Enuma	\$4 million (A)	2015	TAL Education, Softbank Ventures Korea
Epic!	\$1.4 million (Seed)	2014	WI Harper Group
GotIt!	\$9 million (A)	2016	Fosun Group
Kaymbu	\$2 million (Seed)	2016	Sinovation Ventures
Knewton	\$52 million (F)	2016	TAL Education
KnowRe	\$6.8 million (A)	2014	SoftBank Ventures Korea, KTB Ventures
Listenwise	\$600K (Seed)	2016	EduLab
Minerva Project	\$70 million (B)	2014	TAL Education, Yongjin Group, ZhenFund
One Month	\$1.9 million (Seed)	2015	Sinovation Ventures
Ready4	\$8 million (A)	2016	TAL Education, Yongjin Group, ZhenFund
Securly	\$3 million (Seed)	2013	Sinovation Ventures, ZhenFund
Swing Education	\$7.8 million (A)	2016	Sinovation Ventures
Volley Labs	\$2.3 million (Seed)	2016	TAL Education
Wonder Workshop	\$20 million (B)	2016	Sinovation Ventures, WI Harper Group

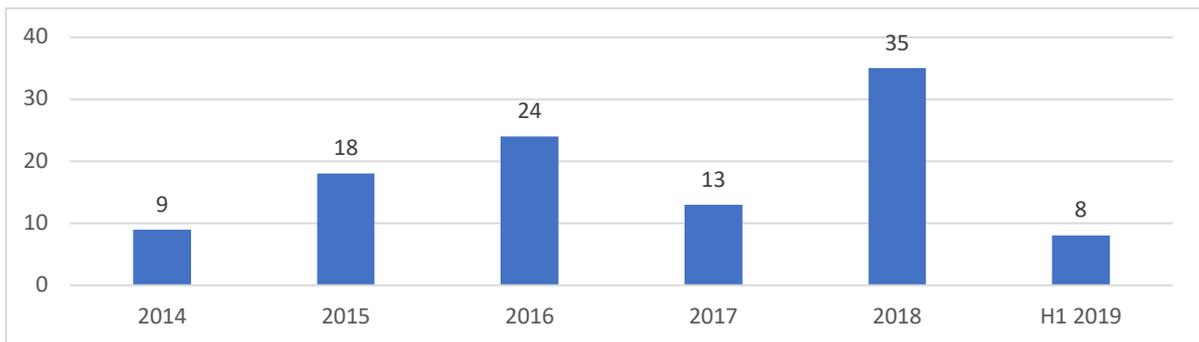
Source: EdSurge, retrieved 16 September, 2019, from <https://www.edsurge.com/news/2017-04-26-the-asian-money-fueling-us-edtech-investments>.

The particularly active investors in this space are TAL Education Group, Sinovation Ventures and ZhenFund. TAL is notably the most aggressive player among Chinese companies that invest in the USA. Sinovation Ventures is a VC fund started in 2009 by former President of Google Greater China, Dr. Kai Fu Lee, and is one of the first Chinese VC firms that is present and invest in the USA (Sinovation Ventures, 2019). The latter, ZhenFund, was started in 2011 by two New Oriental co-founders Bob Xiaoping Xu and Victor Qiang Wang in collaboration with Sequoia Capital China (ZhenFund, 2019). It is a seed fund that has already a portfolio of 18 unicorn companies and made over 700 investments.

3.3.China’s EdTech exits

According to JMDedu, the number of exits of EdTech startups in China through M&As grew regularly in the past years and in 2018 reached 35 deals, up from just 9 in 2014 (JMDedu, 2018). The deal volume is also increasing and in just the first half of 2018 reached US\$3.92 billion in 14 transactions, which is a significant growth from just US\$0.22 billion in entire 2014.

Table 7. M&A deals in China's education sector 2014-H1 2019



Source: JMDedu, retrieved September 20, 2019, from <https://medium.com/@EdtechChina/china-based-education-saw-6-ipos-and-14-m-a-in-2018h1-1809b121855b>.

According to Navitas Ventures report on Global EdTech Ecosystems, among 20 analyzed cities, only three accounted for approximately 57% of all EdTech exits from 2015 to 2017: New York, the Bay Area and Boston. This might be a partial explanation why outside US there are few industry agnostic investors in EdTech. Another one might be that many companies are still in the growth phase and continue to raise private money for further development (Navitas Ventures, 2018).

However, when it comes to public market, the situation in China is changing in recent years. According to CB Insights, in 2016 there were in total 3 IPOs in EdTech industry around the world (CB Insights, 2017). 2017 was a breakthrough with 11 IPOs of China-based education companies and 2018 followed with 14 of them (Deloitte China, 2018; JMDedu, 2019). So far, the first half of 2019 saw 7 IPOs of China’s EdTech startups (JMDedu, 2019). Clearly, the number of companies looking for financing in the public market is increasing.

As for the stock exchange of their choice, Hong Kong Stock Exchange saw the highest number of IPOs: 19. The next choice was New York with New York Stock Exchange and Nasdaq that together recorded 10 IPOs of China's EdTech companies. Two companies got listed on domestic stock exchange in China (A-share) and one on Australia Stock Exchange. As it turns out, each stock exchange is chosen as an IPO destination for particular types of businesses. Just as the biggest two education companies in China, TAL and New Oriental, big K12 after school businesses and online education providers chose New York (JMDedu, 2019). Hong Kong was the most common destination for private K12 school and university providers and seems to remain so with already 12 companies waiting for an IPO on HKSE, of which majority is an either private school or vocational training services provider. Another difference is the use of technology. More traditional education companies prefer to be listed in Hong Kong, while companies that provides services with Internet products tend to choose US stocks (JMDEdu, 2019).

As for recent IPOs in the US, in 2018, Brazilian company Acro Platform also got listed on Nasdaq. Together with Chinese US-listed education companies, their decisions might show a preference of companies from emerging markets to get listed abroad. One of the reasons might also be investor restrictions present on domestic stock exchanges (Navitas Ventures, 2018). According to JMDedu, that is primarily the case of Hong Kong Stock Exchange. The policies in terms of educational assets in A-share are not clear and lead to lower listing efficiency. Therefore, Chinese education companies prefer to get listed in Hong Kong, where the policies contribute to listing success (JMDEdu, 2019).

4. Lessons learned for Poland

4.1. Research method description

To analyze the state of Polish EdTech sector and conclude lessons learned for Poland to promote its development, I decided to interview four experts in the field of Polish EdTech sector:

- **Maciej Mazurkiewicz, a co-owner and CEO of Funtronic**, a Polish startup which produces an interactive projection tool designed for education, games and rehabilitation for children and adults, which is called the Funtronic Floor,
- **Karol Górniewicz, CEO of Skriware**, a Polish-Swedish startup that provides an IoT ecosystem for STEAM education combining 3D printing, robotics and e-learning solutions, through plug and play environment - printer, creator and online marketplace,
- **Marek Termanowski, co-founder and Head of Strategy and Operations at EduChain**, a Polish-Canadian startup that enables academic institutions to issue official academic credentials digitally and automate their verification using blockchain technology,
- **Paweł Czech, co-founder and Vice-President of NUADU**, a Polish startup that offers assessment, drill and practice online platform for education institutions.

The interviews took place between May and August 2019. I interviewed Maciej Mazurkiewicz and Karol Górniewicz in person, however Marek Termanowski and Paweł Czech were only available via Skype and WhatsApp, as they worked in Dubai and Sydney, respectively. All the interviewees were asked standardized questions, but also additional personalized ones to elaborate on a few more topics that occurred. The standardized questions were as follows:

1. What is the state of the Polish EdTech industry?
2. What global trends do you see that will change EdTech the most?
3. Which market(s) in the world is / are the most innovative in the EdTech industry and what is this innovation about?
4. What best solutions and practices in the world should we duplicate in Poland to increase the innovativeness of our EdTech?
5. Do you use any best practices taken from the world in your company on a daily basis?
6. Where do you currently see the best place in the world to open an EdTech company?
7. Do Polish EdTech companies have the chance to become global companies and do we have the potential to build such companies?

8. What problems are Polish EdTech companies facing and how to solve them?
9. What advice would you give Polish entrepreneurs who are starting their adventure with EdTech?

Due to the fact that interviews were conducted in Polish, the transcriptions were not attached to the thesis. However, they are available immediately on request at e-mail anddaniluk@gmail.com.

4.2. The state of Polish EdTech sector

Paweł Czech assessed Polish EdTech sector to be at an early stage of development. Karol Górniewicz finds the overall state to be rather good and points out that there is a great potential in Polish EdTech, which has already been proven by a global success of some companies. Maciej Mazurkiewicz said that this sector is full of creative ideas and many young people turn them into reality, so there is a lot of emerging startups. However, this is where this positive state ends.

My interviewees pointed out that the key problems with Polish EdTech are the lack of capital, know-how, educated staff, access to foreign markets for expansion and reluctance to cooperate with other Polish startups. The first problem relates to two reasons. Firstly, there is insufficient government support when it comes to the structural funds that could improve the competition on domestic market and help with the expansion. Secondly, EdTech VC funds almost do not exist in Poland, so companies have to build a product dedicated for foreign markets from the very beginning and look there for funding. It is very difficult to find big funding in Poland and a ready product and whole business is usually needed to attract investors. When it comes to ‘smart money’, which are non-financial benefits provided by the investor, such as contacts to future clients or other startups, it is even more difficult to find an expert in the field who could help (Ratajczak, 2018). In Poland, there are just a few people that have the sufficient knowledge and resources to do so. Because of the lack of financial resources, startups often times lose liquidity and are unable to put their product on the market. Too little customers for the product and small amount of financial resources for the development make many startups go bankrupt. The second big issue with Polish EdTech sector, the lack of know-how about building EdTech products, makes Polish companies to have no choice, but learn from abroad. Karol Górniewicz says that it is indeed difficult, but on the other hand it could be a window of opportunity, because

it makes companies think globally with their products, which is very positive. Thirdly, insufficient amount of enough educated people makes it difficult for some employers the find the right employees. According to Maciej Mazurkiewicz, it is tough to find highly skilled engineers, especially electronic engineers, because people who graduate from Polish universities often times do not have enough knowledge. The only candidates with potential are students who interned in addition to the university. Without it, candidates have no basic practical abilities. Another problem is that Polish EdTech companies have difficulties with access to foreign markets for expansion. According to Paweł Czech, poor quality of marketing materials in Polish companies and big competition from other countries connected with the lack of capital for sales specialists makes it very difficult to find customers. On top of that, there is some sort of unwillingness among Polish companies to cooperate and rivalry on local market, instead of teaming up and competing against rivals from other countries. Last but not least, Marek Termanowski expressed his disappointment with the existing bureaucracy in Europe. His company does business in many parts of the world, including South and North America, and Asia, but nowhere he saw such bureaucracy as in Europe.

However, all of my interviewees in the chorus agreed that Polish EdTech has a great potential. Karol Górniewicz pointed out that Polish EdTech market grows rapidly, by approximately 20% year on year depending on the category. Moreover, Poland distinguishes itself in Europe when it comes to EdTech. According to Startup Poland's report, The Golden Book of Venture Capital in Poland 2019, Polish EdTech Brainly raised second biggest round of financing among Polish startups of EUR12.4 million in 2018, right behind Docplanner's round of EUR15 million (Startup Poland, 2019). Moreover, between September and December 2018 CEOWORLD magazine conducted a survey on the most startup friendly countries in the world and the results were very favorable for Poland (Papadopoulos, 2019). Nearly 200,000 people from 95 countries in America, Asia, Europe and Africa, including business leaders and college-educated, middle- or upper-class individuals cast their votes in five major metrics: Human Capital Investment, Research and Development, Entrepreneurial Infrastructure, Technical Workforce and Policy Dynamics, which in result located Poland as seventh most friendly country in the world. The highest ranked category for Poland was Entrepreneurial Infrastructure, which means the success rate of converting research into commercially viable products and services. Moreover, the same magazine ranked Poland as second best country to invest in or do business for 2019 based on 11 different factors including corruption, freedom (personal, trade, and monetary), workforce, investor protection, infrastructure, taxes, quality of life, red tape, and technological readiness

(CEOWORLD Magazine, 2019). The only more attractive country, according to the ranking, was Malaysia.

The great potential in Poland might also be seen through the talented human capital that it has. Paweł Czech points out very talented Polish computer scientists, which are one of the best in the world. According to HackerRank, a technology company that prepares programming challenges for both consumers and businesses, Polish programmers rank third in the world with only Chinese and Russians taking first two spots, respectively (Triakha, 2016). Moreover, when it comes to algorithms, Poland ranked second, only behind Russia. The countries were ranked based on the average score across all HackerRank challengers. Furthermore, Polish talent is relatively cheap. The costs of running a business that depends on the software engineers in Poland is one of the cheapest around the world, while getting one of world's best quality.

So far, Polish EdTech scene saw emergence of a few companies with great potential, some of them already fundraising millions of dollars from Venture Capital firms. In the table 8 below, I prepared a comparison of Polish EdTech companies with the highest valuation and total funding amount.

Table 8. Polish EdTech companies with the highest valuation and highest total funding amount

	Company	Valuation (US\$ million)		Company	Total funding amount (US\$ million)
1	Brainly	100-500	1	Brainly	68.5
2	Explain everything	10-50	2	Explain everything	5.7
3	Funtronic	19	3	Skriware	4.3
4	Skriware	8.5-11.3	4	Nuadu	1.8
5	Nuadu	6-9	5	Fluentbe	0.8
6	Fluentbe	2.7-4	6	Robocamp	0.53
7	BeCreo	2.5-3	7	Edustation.me	0.25
8	Photon	2.5-3	8	Absolvent	0.25

9	Robocamp	1.8-2.7	9	Vocabla	0.2
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Source: Own analysis based on Crunchbase, retrieved 19 September, 2019, from <https://www.crunchbase.com>, and Mam Startup, retrieved 20 September, 2019, from <https://mamstartup.pl/zestawienie-najwiekszych-inwestycji-w-edtech-na-swiecie-i-w-polsce>, and GoMobi, retrieved 20 September, 2019, from https://gomobi.pl/blogi/6-trendow-edtech-ktore-maja-znaczenie/?opanda_confirm=1&opanda_lead=9419&opanda_code=20a91db57c4104b612ce6b3cbae61377.

4.3. Takeaways from best practice and some suggestions for improvement

4.3.1. Propositions on how to solve problems in Polish EdTech

How to solve problems in Polish EdTech sector, improve its competitiveness and drive innovation? My interviewees listed many ideas that might be the exact solution or at least a starting point for future work.

As there is a lack of private capital on the market, the government should introduce public support in the shape of dedicated funds from institutions like the National Centre for Research and Development (NCBiR) and include additional support for education in its strategy. According to Karol Górniewicz, as there is a great potential for EdTech companies in Poland, the government should reconsider the allocation of its funds, as some of them are spent in the fields that Poland doesn't much chances to compete in with the rest of the world, such as electric cars.

When it comes to know-how, Maciej Mazurkiewicz suggested that along with the financial support, there should be a management support for young companies. Polish EdTech needs events or organizations that will accumulate startups and investors that will have the knowledge and expertise to help these firms grow. Often times the people who open startups are engineers, which have no clue about running a business from day to day and it is a very tough task for them. Moreover, Polish EdTech companies should cooperate together to exchange knowledge, give advice and support with foreign business trips, which are indeed expensive, but might bring great results. Finally, they should look for product synergies to build fully adjusted to

schools needs and complex products together. In such way, the value proposition for customers would be really attractive. Maciej Mazurkiewicz notices that if several companies went on a foreign convention and displayed several products, instead of one, the cost would be almost the same in total, but more companies could grab attendants' attention, especially if products were complementary. These are the kind of groups Polish EdTech needs to have, he points.

Another problem, which is the difficulties with access to foreign markets by Polish companies might be solved with government help. An agency that does it well is Polish Investment & Trade Agency (PAIH), which promotes companies internationally and helps them to promote their products at fairs. However, according to Maciej Mazurkiewicz, a better way to promote a company and its product is through business network. In his opinion, far better than fairs are business meetings or some sort of workshops organized in a foreign country, which are visited by potential distributors. This way, companies might show their product and grab their attention, which might result in the cooperation later on.

As for the reluctance to cooperate, the approach in Polish companies has to be changed. Instead of competing, startups should team up, travel for a trade fair together and split budget, share distributors' contacts and support in sales to scale their businesses. According to Karol Górniewicz, a culture of sharing knowledge and perceiving a failure as a way to success must be promoted. In Poland, when someone fails most probably will not be able to get another chance in building a business, as it is believed that this entrepreneur had and lost his chance. In the USA, on the other hand, this person will more likely gain investors trust than other candidates because of this experience and lessons learned, which is quite obvious and natural, but not so intuitive as for Polish perspective.

However, to drive the growth of EdTech market in Poland, some fundamental socio-cultural changes among potential consumers must happen. Karol Górniewicz points out that Poles have to stop perceiving education as process, which only takes place at school, and start to understand it as an ongoing process through the life span. Nowadays, often times we can hear that people who enter the job market will change their jobs dozen times and work in three different professions. For sure, the awareness among Poles is growing, especially after the April's teachers' strike in Poland this year, that their children will not learn everything they need in public school and exams' results do not prove anything. To extend their skills and knowledge, children have to attend extra classes, which are often paid. However, most of parents do not

have enough money for this investment in education. As a nation, Poles save very little and consume a lot, which doesn't help to accumulate savings. Moreover, public universities are free of charge in Poland and that doesn't help to develop saving habits. Górniewicz notices that, in his opinion, some parents have already understood this philosophy of investing in children's education and it is a great moment to enter the market with private universities, as the demand is growing. Another aspect is to focus on teachers, as the technology itself will not solve all the problems there are. The teachers the bottlenecks and are the biggest chance to drive the market of EdTech products and improve the level of education. Teacher-centric approach allows to give full support and show teachers how to use technology in education. Otherwise, they would not like to change their habits and discover a more efficient way of teaching with EdTech products. The EdTech Poland Foundation, in which Karol Górniewicz is one of founding members, aims to create that approach and support teachers. Moreover, the Foundation members are experts in the field in Poland and are committed to support each other during foreign business trips, share contacts to clients, finance EdTech research together and build Polish know-how.

4.3.2. World's best practices used in Polish EdTech companies

In order to summarize the best practices used in EdTech companies, I asked my interviewees to share practices they use in their companies. Maciej Mazurkiewicz says that the main one they have is to invest in people. It is crucial to invest in your team, because great time is the biggest success factor. Second practice he shares is to work on marketing and sales. Even if there is a great product, it is very difficult to make money if it is not advertised well. Karol Górniewicz points out human resources management. He underlines that to manage people is to work with and for people. The company's business is important, but you cannot forget about your employees' business, because they are the company's greatest asset. When it comes to the business model, he shares that Skriware is working on subscription model, which is something that is not so common. However, some EdTech businesses already have it and it is very important, as it helps to keep having recurring revenue. His third best practice is to attend conferences, but in a reasonable way. Such events are great time and place to exchange ideas and experiences, but they are less important than running a business, therefore they should not be overattended. In particular, Górniewicz recommends EdTech conferences abroad in such places as London, Singapore or Dubai. Paweł Czech shares insights about internal communication and that a good way to organize work is with help of such tools as Facebook

for work or Microsoft Teams. Another good practice relates to setting objectives and delivering them, which Objective and Key Results technique is very helpful with. Third one is connected to company's strategy and Czech recommends using Harvard University methods to pick markets to expand to later. Last but not least, he points out transparency. A great practice is transparency of salaries, investment structure and running a business.

4.3.3. Advices for beginner entrepreneurs

When asked for advices to share with Poles who think about founding an EdTech company, my interviewees shared many helpful insights. Maciej Mazurkiewicz encourages to awake the creativity and consider all business ideas, as every idea is worth it. However, a realistic business plan is crucial, and founders shouldn't hesitate to ask for help to verify its practicality. It's better to prepare a more pessimistic version and get positively surprised later, than the other way around. The main reason for startups to go bankrupt is lack of liquidity and a solid plan is needed to avoid it. Last but not least, Mr Mazurkiewicz mentions the importance of human capital and that in his opinion a strong team is key to success. Karol Górniewicz also encourages to reach out to people on the market. He stresses that it's important to learn on the mistakes that other people have already made. In his opinion, Poles are increasingly more likely to share their knowledge and trust each other to build value together, motivated by pure business thinking and without emotions. Moreover, he encourages founders to approach the abovementioned EdTech Poland Foundation. Marek Termanowski advises everyone how wants to work in education sector to stay patient and work on people skills. He notices that in every business patience is crucial, but it is especially important in education. Moreover, good relations with people in this sector are very important, as it is way easier to sell and implement your product or solution in such big organizations as educational institutions, when you are in particularly good relations with one of the employees. Often times these institutions are the size of several dozen thousands of students. Then, this employee might turn to be your 'champion', who help you contact to the decision makers and sell and implement your product way faster than via contact mail on the website. Furthermore, such approach is crucial if the company is expanding to foreign markets such as the Middle East or Asia, where relations are more important than any document. Paweł Czech suggests starting a company in Poland, but later quickly moving business to other country and selling products and services abroad. The entrepreneur states clearly that there is no will to implement innovation in Poland, so truly innovative, high quality products have to be sold abroad and eventually might come back to Poland and become

available on Polish market. Another suggestion is to think globally from day one while creating the product. Poland with its approximately 38 million citizens is big enough to create a good scale by selling a product locally and startups tend not to think globally, which might be another factor that limits them from creating global businesses (The World Bank, 2019; Mokrzycki & Sabat, 2019). In comparison, entrepreneurs from small markets, such as Sweden or Estonia, have to think from the very beginning to sell their product globally. Moreover, according to Tom Prahill, CEO of Navitas Ventures, the analysis of “The Global EdTech Ecosystems” report showed that a strong EdTech sector was not dependent on the population density. “When you look at a lot of those emerging cities, they are often export-minded. They are centers for innovation that realize that you need to immediately move outside of your country’s borders in order to access students and customers”, he explained (Crace, 2018). The emerging cities in EdTech space such as Tel Aviv or Stockholm created a flourish environment through trade, which is definitely a lesson that Poland should learn from. There is another great example of such country that managed to find its edge in Europe. Finland, which is internationally famous for the high-quality education system, leverage its brand of “made in Finland” and Finnish EdTech startups are well known around the world for the quality and innovation of their offerings, especially in the field of gamification deployment (Navitas Ventures, 2018). This mechanism shows how the quality of education system support the development of best-in-class solutions that find their applications all around the world.

The analysis of 20 EdTech hubs around the world in “Global EdTech Ecosystem 1.0” report, shows more learnings from best practice of global leaders in their fields and especially Beijing, the Bay Area and New York, which were ranked as top three (Navitas Ventures, 2018). The first learning is to build a complete ecosystem locally and provide EdTech startups with acceleration programs and contacts with international EdTech experts, but primarily with funding availability. The second advice is to “focus on building density, capability and brand recognition in specific education technologies or applications”. Without a doubt, it will be very hard for the emerging EdTech hubs around the world to compete with products across the entire learning lifecycle from countries where EdTech is well developed, especially that these places created a broad range of companies at all levels of maturity. Therefore, they should focus on creating an edge in specific technologies and niches. Another suggestion is to create an ecosystem ‘champion’ company, the role of which will be to guide the cooperation within the country and internationally, as well as coordinate sector development. Thus, a mature player might empower younger and less experienced colleagues. Next learning underlines the need for

extensive local government support, as well as strong partnerships with local universities, which is common among the global leaders. While the extensive government support is a more complex thing to achieve, the partnerships with local universities and schools is something EdTech startups in Poland should definitely aim for. On top of that, cooperation with these institutions might be a great test-bench for startups and provide them with the opportunity to get feedback about their products, prove that there is a demand for them and create capability to expand to other markets. According to HolonIQ, all around the world governments are struggling to fund education and there is still not enough private capital to fund the needed innovation. Therefore, public-private partnerships might be critical to “supporting future growth, innovation and access to education” (Holon IQ, 2019). A great example of university-industry collaboration in the education sector is the latest news from Peking University and Tencent about their cooperation. On April 23, Peking University’s prestigious Guanghua School of Management and Tencent announced an online business school in the shape of education platform “Qingteng”, which will leverage “Guanghua’s academic achievement focusing on China’s economic development and Tencent’s experiences in running its online business empire” (Peking University's Guanghua School of Management, 2019). The school’s faculty will include “Guanghua professors, Tencent’s senior executives, leading startup entrepreneurs, venture capitalists and leaders of global businesses”.

Unquestionably, China gives a leading example of a place that created several mechanisms to support its EdTech. The government support the industry with both reforms and invest over 4% of GDP in education. It has also found its test-bench – Shanghai (Navitas Ventures, 2018). The city often gets the privilege of experimenting with education reforms before implementing them across the country. Hence, it has led its schools to become more open to the adoption of innovation. Moreover, giant EdTech startups that mostly operate in K-12 sector show that country is specialized in this field and was able to take advantage of the largest K-12 population globally. A great adulthood of parents might also be spotted here. They do see education spending as an investment in the future of their children, that will make great return later, and consciously invest close to one fifth of their income. Furthermore, China’s strategy for the future of economy development shows a great wisdom. The government make long-term plans, which promotes the country to think about education and the development of EdTech in the long-term perspective. This is very positive approach for this type of businesses, as the true results don’t appear immediately, and effects are difficult to measure. On top of that, the

government promotes technology development and make huge investments to become the global leader in AI, which will also significantly influence the education sector.

Poland has already made first steps in the development of capital availability on the market. In recent years, Polish Development Fund (PFR) opened PFR Ventures, which operate in the Fund of Funds formula and provide “financing via VC funds and groups of business angels for innovative SMEs at different stage of development”, from seed to growth and expansion (PFR Ventures, 2019). Within PFR Ventures, five funds were created with almost PLN 3 billion to build a high-risk financing VC market and invest in startups at every stage of development (Nawacki, 2017). The first investments by VC PFR funds were done for more than PLN 100 million and one of them was done in EdTech company, which is not many, but it is a start (PFR Ventures, 2019). A VC PFR fund Montis Capital invested USD 1.7 million Series A in Skriware. There is a great need to increase the amount of invested capital in Polish companies with great potential, as innovation requires capital.

When it comes to the national champion, Poland seems to already have one, which is Brainly, the second most funded startup in Poland with USD 68.5 millions of total funding. Brainly might help younger EdTech startups in Poland and share its expertise in expanding to foreign markets among other topics it has an experience with.

Furthermore, the number of innovative private schools in Poland is increasing. On 10 September 2019, the first in Poland and twenty-first in the world, Microsoft Flagship School was opened in Gdynia (Kotkowski, 2019). The school’s partners include three Polish EdTech startups: Skriware, Photon and NUADU, and it aims at educating digital competences in its students, which is why there are HP laptops in the Computer Science classroom, Photon robots to learn how to code and 3D printers from Skriware. Undoubtedly, Poland needs more such schools across its country, and definitely way more cooperation with Polish EdTech startups, but this is a great way to start.

4.4. Polish-Chinese Cooperation

China is a growing trade partner for Poland. In the first quarter of 2019, Polish export to China increased by 35.5%, according to Polish Economic Institute (Business Insider, 2019). Hence, China has moved up by three spots and has become the twentieth export market for Polish

products. Its share as an import market for Poland also increased, but the country remained on the second position in the ranking. This shows how significant a trade partner is China for Poland. However, to become a more valuable partner for China, Poland has to increase its exports, as currently it lags behind small countries such as the Czech Republic and Hungary (Rosa, 2019). Currently, Poland is the fifty-fourth biggest import market for China and twenty-second export market. Nevertheless, in connection with the “One Belt, One Road” initiative and the development of road, sea and rail infrastructure, Poland declares that it wants to become China’s main trading partner in Europe. It is worth recalling that in 2013 a freight railway connecting Łódź and Chengdu was launched as a part of the initiative and in 2019 the Skyworth Express railway line is predicted to transport parts of up to 1.5 million Skyworth TV sets (300GOSPODARKA, 2019).

Furthermore, the number of Asian investors is growing not only in the USA. In Europe, international investors’ activity is increasing and according to Finnish Industry Investment Ltd (Tesi), “this trend can be seen as one sign of a geopolitical shift in which the relative dominance of Asia, and especially China, is strengthening” (Tesi, 2017). Strategically, it is very important for Poland to take advantage of this trend and attract Chinese capital to the national businesses and initiatives, that need it for the development. Moreover, there has already been a deal made by Polish EdTech startup with Chinese investor. In April 2018, Skriware received a convertible note funding from Tsinghua Holdings, a wholly owned subsidiary of Tsinghua University, which invests heavily in startups and runs its own incubator, TusStar (Tusholdings, 2013). The incubator is one of the earliest and longest national incubators, which turned it to be a well-known brand.

We can also see the growing cooperation in research projects between Poland and China. In September 2019, the Faculty of Electronics and Information Technology at Warsaw University of Technology opened Shanghai Warsaw Artificial Intelligence laboratory (ChinyTech.pl, 2019). As a part of the “One Belt, One Road” initiative, Shanghai Science & Technology Innovation Resources Data Center and Computer Science Institute at Warsaw University of Technology signed a letter of intent in February 2019, which established the lab. The project is aimed at the development of AI algorithms and their application for data analysis purposes. The project creates great opportunity for Poland to learn from China’s expertise in the field of AI and increase its competitiveness.

AI lab is not the only academic program between Poland and China. In April 2019, National Science Center (NCN) announced that it will donate almost PLN 37 million for Polish-Chinese research as a part of the SHENG 1 competition, which has just been concluded (PAP - Nauka w Polsce, 2019). In the competition, applicants can obtain funds for Polish-Chinese basic research in the fields of life sciences, exact sciences, and technical sciences, as well as in selected disciplines of social sciences. The competition is a result of collaboration between the National Science Center and the Natural Science Foundation of China (NSFC). It was the first edition of the competition.

Conclusions

With the rise of technology, the education sector is getting disrupted at a fast pace. Educational products are able to provide personalized learning experience and help to improve its effectiveness. Offline business models are becoming more and more often replaced, or at least empowered, with new online ones. No one can tell how exactly the future of educational path will look like, but one thing is certain: the technology will play a key role in it.

Even though United States remain the education technology leader according to all of my interviewees, Asia and particularly China, has become the fastest growing e-learning markets in the world and currently the “Middle Kingdom” accumulates over a half of VC money invested in educational technologies (Lynch, 2018). Unquestionably, China is an innovative EdTech market and the analysis conducted in this thesis has proved it right. Chinese companies provide consumers with innovative products built by leveraging the new available technologies and their penetration. Overall, Chinese EdTech offerings improve the consumers learning experience, either by offering purely online products or hybrid models with additional online features to basic offline services. This allows to improve the efficiency and access of educational resources, especially with the consumer-centric approach of many companies. In the result, Chinese EdTech companies support the development of true 21st century skill set by its consumers. On top of that, the ecosystems built in two first-tier Chinese cities, Beijing and Shanghai, are world’s best examples of the support EdTech startups should receive. Chinese parents with their mindset of education as an investment are the example to follow. Together with many other factors that drive the growth of EdTech in China, these dimensions show that there are mechanisms that can help EdTech to grow in other places as well indeed.

As for EdTech sector in Poland, there is a lot yet to be done. However, there is also an example to learn from. Through a number of initiatives, Poland has recently increased its cooperation with China and undoubtedly, collaborative working pays off and is a great thing to drive the development of ideas and then innovation. For sure, Poland has to improve the state of its AI, because it lags behind the rest of Europe, not to mention the rest of the world, and it is one of key technologies that is affecting educational products. Polish parents have to change their mindsets and invest in their children by leveraging the available technologies, so that their children can develop a 21st century skillset that will be crucial in the upcoming future. There is a great need of attracting smart money investors to Poland, also from Asia, and particularly

China, to help young companies grow. A common cooperation between Polish startups must be established, to learn from each other and avoid predictable mistakes. Moreover, Polish EdTech companies should try to find its edge, which will help them make the next step of entering foreign markets. Startups should not forget to develop global products from day one, as they might get trapped by the size of Polish market and create only locally applicable solutions, which will limit their growth opportunities. On top of that, the investments in education has to increase significantly, as it means the investment in Poland's future. According to Maciej Grodzicki, PhD, Institute of Economics, Finance and Management at Jagiellonian University, "And above all, it is necessary to increase expenditure on education and science. The world will change in a while, nobody knows how this change will look like, and in such a situation any investment in education will pay off, because people who are trained in thinking will do better on shifting sands" (Sroczyński, 2019).

Even though the task is not easy, the great talent in Polish people and examples to follow mentioned in this thesis make it fully feasible. There is a number of promising Polish EdTech startups that start to conquer foreign markets, with Brainly leading the way. Hopefully, they will guide younger companies on how to use their full potential and boost Polish EdTech sector to become a substantial EdTech hub on the world's map.

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List of tables

Table 1. EdTech product categories with examples of companies	8
Table 2. EdTech unicorns as of 9 August 2019	18
Table 3. Comparison of the largest funding rounds among EdTech startups in China and abroad	31
Table 4. Descriptions of dimensions in Navitas Ventures' „Project Ecosystem 1.0” report	36
Table 5. Numbers of deals for most active EdTech investors in USA in 2018	56
Table 6. Asian investors in USA-based EdTech companies.....	58
Table 7. M&A deals in China's education sector 2014-H1 2019.....	59
Table 8. Polish EdTech companies with the highest valuation and highest total funding amount	64

List of figures

Figure 1. Global education market expenditure 2000-2030	10
Figure 2. Global EdTech Venture Capital investment deal value 2013-2019.....	12
Figure 3. Global EdTech Venture Capital deals over US\$ 100 million since 2010.....	13
Figure 4. Global EdTech Venture Capital deals over US\$ 50 million in 2018	14
Figure 5. Global education Venture Capital investments in China, USA, India and European Union 2014-Q1 2019	15
Figure 6. Global EdTech expenditure in AR/VR, AI, Robotics and Blockchain technologies 2018-2025	16
Figure 7. Market capitalization of 15 largest public education companies as of 9 August 2019	17
Figure 8. China's online education market revenue 2012-2022	21
Figure 9. Share of China's online education market segments	22
Figure 10. Revenue of China's online K12 education market	23
Figure 11. Size of AI online education market in China	24
Figure 12. Share of parents who have paid for private tuition of their children	26
Figure 13. Comparison of Venture Capital money raised in China and USA 2012-H1 2019 .	30
Figure 14. Distribution of financing rounds in China's education sub-sectors in 2018.....	32
Figure 15. Investment share of K12 sub-market in China.....	33
Figure 16. Funding amount of K12 sub-market in China.....	34
Figure 17. Investment share of language learning sub-market in China 2014-2018.....	34
Figure 18. Funding amount of language learning sub-market in China	35
Figure 19. Ranking of EdTech cities in Navitas Ventures' „Project Ecosystem 1.0” report ...	37
Figure 20. Language learning solutions market map by Brighteye Ventures	45
Figure 21. TAL's AI educational product with image recognition function	51

Attachment 1

Interview with Jeffrey Towson

Jeffrey Towson is a Professor of Investment at Peking University's Guanghai School of Management. Previously, for eight years he was the Head of Direct Investments for Middle East North Africa and Asia Pacific at Kingdom Holding Company, which is the development and investment company of HRH Prince Al-Waleed bin Talal bin Abdulaziz Al Saud. He holds a MD degree from Stanford University's School of Medicine and MBA from Columbia Business School.

The interview was conducted on August 11, 2019.

How would you describe the state of Chinese EdTech?

For me the starting point for China is always consumers. Especially anything digital, because the digital world of China is driven by consumer demands. Anytime there is a direct connection between any business and Chinese consumers, things happen very, very quickly. If it has to go through something structured like hospitals, then it doesn't happen. Financial services – it doesn't happen. However, if it is direct to consumers, it really moves. Now, Chinese consumers, and really what you are thinking of are families, it's about families, that's the unit of buying, really cares about education. They care about it more than any major country I have ever seen. It is deep in the culture and it is deep in this idea that you sacrifice everything for your kids. It's in the family priorities. There is also the gaokao, that every student has to take at the end of high school, and they are being prepared for it for like a decade. Families will spend an amazing amount of money to do that. So, a lot of what you see in education tech is about either language training, because they have to pass this test if they want to go to university or any other training outside of China. And the gaokao is like an arms race. It's not that you just have to spend money on it, but if another family is spending more, you also have to spend. It is like an endless competition for who is going to spend more on their kids' education to get them through the gaokao. It's like an arms race at the family level. Chinese families spend more on private education than any group on the planet as far as I know. That's how I think about it, it's like an arms race between the parents on who can spend more on their kids' education prior to the gaokao. Within that you see a handful of players that have emerged based on this consumer

phenomenon. The established companies like *New Oriental Education (XinDongFang)* and *TAL*. They have private education on every street in like 50 cities.

Chinese consumers are growing on wealth, but that's not always great depending what you are doing. If you are selling food, people don't keep spending more and more on food – you do kind of run out of what you can spend on food. You don't spend that much on appliances – you don't buy 10 washing machines. But certain sectors keep going up with money. One of them is education spending. The more money you have, the more money you spend on education. And given that it is a bit of an arms race, if other families are spending more, you have to match it, or your kid does not do as well. In theory. So, it's one of the few sectors that keeps going up. Healthcare also goes up, you can spend more and more on healthcare, and travel tends to go up, you can just take nicer vacation. Education is one of those ones that is going to ride the wave of Chinese spending for the next 20 years. Not everyone will benefit from it. People selling tissues or washing machines aren't going to keep going up. People will not buy 10,000 dollars washing machines. So that's one of the biggest benefits of this sector that it really does benefit from the spending curve.

Which EdTech market in the world is the most innovative and how would you position China's EdTech in comparison to other countries?

This is where you have to sort of break it in the college and pre-college. Once you go to the higher education, the west is much better. But everything pre-college, I haven't looked in every country, but I would put China as the top. Their spending is the highest, people are most aggressively involved in it. Parents are hugely focused on it. I would suspect it's China, but I don't have any data to back that up. You might also look up at countries like Singapore or Taiwan. It might be pretty great there too. But definitely, China will be in the top three.

Is Chinese EdTech industry innovative? If yes, what innovative is there exactly?

The problem with innovation is that nobody really knows what it means. There is no really a clear definition for it. If you look at spending, then I think China is probably number one for private education spending before college. If you look at language education, I'm almost sure they are number one, because everyone is studying English. So, on the spending side I would probably put them a number one, I have to check but I am pretty sure. If you consider innovation as a sort of customer-centric innovation, which is what Steve Jobs did – he didn't invent

anything, but he did find clever ways to put things together to make it more customer-friendly and interesting, definitely they are pretty good there. There is a lot of companies focused on using digital tools to either create new business models, which would be *Liulishuo*, *51talk* and *VIPKID*. Those are all purely online business models. Some of them are just connecting teachers from Philippines with students, it's just online one-on-one education. Then *Liulishuo* is trying to replace all education with AI and study groups. No teacher. And then you can look at established players like *TAL Education* and *New Oriental*. Those are traditional, in person, local teaching centers and they are adding online capabilities. That's pretty interesting. I think that *TAL Education* is probably the most aggressive. They are doing a lot of M&As on the digital side and trying to complement their physical locations. I suspect that's probably what is going to work out the best is a hybrid between this off and online. I think that one of the problems with the replacing teachers with just software is that it is primarily the argument for convenience and cost savings. And that's not what parents care most about. What they care the most about is quality. And then after quality convenience and then cost savings. Until those purely online creatures show that they deliver the same level of quality as a down screen physical one, I don't think that parents are going to trust them. Quality of your kids' education is more important than the price. So, they have to prove themselves quality-wise still. The established physical players like *TAL* and *New Oriental*, they don't have to prove themselves when it comes to the quality. I suspect those are going to do much better. I think *TAL* is the most aggressive in terms of what they are doing. And I suspect that's probably the near future. It is not replacing teachers; the near future is augmenting them, giving them digital tools and making them more effective and productive, but I don't think it is replacing teachers. It's much harder to go from online to offline than vice versa. If you are going from online to offline you have to open up teaching centers in tens of cities and the companies that have done that like *TAL* and *New Oriental*, it took them years. I think it took *TAL* 15 years and it took *New Oriental* like 25 years. It takes a long time to open centers, hire the teachers, fill the classrooms. So, I don't think the online players are in position to do that and I don't know if they want to do that. So, I think it will be from offline to online, but we'll see.

What are the risks, problems and uncertainties in China's EdTech future?

The biggest one is regulation. It is not certain that the government likes this at all. The regulations are pretty strict. So, I think that's the biggest problem. The parents want it, but it is unclear if the government does and the education sector in China is highly regulated. Now if

you are doing something like language learning there is a lot less to do. Keep in mind that the government doesn't just regulate that you must be credential, but the government cares about what the actual content is. That it reflects certain values. Now if you are doing language, there is a lot less in that because it is just language. If you are doing mathematics, okay. But a lot of this education is going to fall into a curve view of what the government cares about. They care about this stuff. So those are probably the biggest one, and I think that people are underestimating, that there are a lot of misgivings about the government on how much this private education should be happening. And if there are educational needs, why they are not happening in the public schools. So, the regulations are pretty tough. That would be number one.

Number two is that I think a lot of the currently online ones are unproven. If you are VIPKID you are basically taking real teachers and you are putting them online for students. You are just doing the classroom online, one-to-one. Okay, that's fine. 51 talk is the same way. But if you are starting to replace teachers and all of this, it may not be very effective. There is a lot of uncertainty in the product quality once you remove teachers and that's Liulishuo and a few others that are doing it. Those are probably the two big ones.

The other thing to keep in mind is that a lot of regulations are about what the teachers are allowed to do. For the longest time if you were a doctor and you had a job at a public hospital you couldn't work anywhere else without their permission. Your medical license wasn't tight to you but tight to the hospital you were working. So, I'm pretty sure the new regulations that came out on teachers limit what they can do outside of their primary teaching. Now, that limits the pool of teachers dramatically, if public school teachers are not allowed to do this or are very limited on what they can do, which I think is the case. So, there is regulations on the content, there is regulation on how many hours can be spent and then there is the regulation on the labour. Highly regulated sector in China.

I was also wondering on some macro perspective things happening generally, like the trade war that is slowing down the economies a bit. I run into an article in Financial Times which showed that the investment in EdTech, and overall in Chinese startups, is decreasing in 2019 from the peak of 2018. One of the reasons for that was said to be the trade war.

The VC money moves in waves to certain sectors. Bike sharing was super-hot 2 years ago. Digital health was crazy popular like 2016 and then it cooled and moved to other places. So, I would expect there is also an EdTech wave, but I don't know where it is within that and I don't suspect these macro factors will impact active VC money.

Education is a purely domestic business. Certain businesses are good by the trade thinking because they are in that business, like manufacturing. You can see manufacturing money slow down because nobody knows how rough the trade war is going to be, but education is pretty domestic. Local students, local teachers, local money. I would be surprised if that was impacted by the macro situation.

Abstract

Education plays the key role in shaping the future of the nation and its economy. Together with the rapid economic development in the last 40 years, China saw the emergence of many big education businesses, including the two largest public education companies. Currently, the area of education is entering a phase of radical change brought by the digital transformation. One of the leaders of Educational Technology market growth is China with a massive wave of young emerging EdTech startups, that use modern technologies to offer new value proposition to consumers.

In this thesis, the author states the hypothesis of China as a supportive creator of innovative EdTech businesses, which gives an example to follow. In the first part of the thesis, the author conducts an analysis of global EdTech sector, which is followed by the analysis of China's and Poland's EdTech sector in the next chapters. At the end, the author concludes lessons that Poland should learn from China, as well as other world's best examples, to boost its EdTech sector and support creation of global education companies.