Making another century of impact
Trend one: Sub-sectors are showing "full blossom"
Trend two: Capital market is gaining ground
Trend three: STEAM ushers in a golden age
Trend four: "Going global" trend is continuing to heat up
Trend five: Educational real estate develops toward diversification
Trend six: Technology redefines education
Preface

China's education industry is in a period of rapid growth. Policy, capital, technology and social concept, as the key factors in driving steady growth of education market for a long time, will bring China's education industry toward six "new heights".

Height one: sub-sectors are showing "full blossom". Different from the imbalanced development situation over the past few years, this year each segment of education industry will gain broader space for development. For preschool education, domestic early childhood education organizations spring up and more kindergarten brands are being established; leading private training organizations engaged in K12 education will invest in multiple sectors and enhance standardization; regarding vocational education, increasing academic education organizations are developing toward collectivization and school-enterprise cooperation encouraged by a series of policies under the 13th Five Year Plan, and organizations engaged in non-academic education have reformed traditional teaching methods by embracing new technologies; enterprises will make cross-sector investments into international schools more frequently, such asset-light mode may be widely adopted in the future. In addition, new Non-state Education Promotion Law of the People’s Republic of China (Non-state Education Promotion Law) will accelerate education asset securitization and promote the transformation of private education organizations to a higher level of development.

Height two: capital market is gaining ground by hitting new records in the scale of M&A and asset securitization.
Due to the pressing transformation needs of listed enterprises, the scale of M&A soared and peaked in 2016; the listing boom of education enterprises on the New Third Board has made the amount of securitized education assets reach a new high; moreover, educational technology sector has become a new investment hot spot.

Height three: STEAM (Science, Technology, Engineering, Arts and Mathematics) education ushers in a golden age. Backed by governmental policies and capitals, STEAM education expands rapidly in first-tier cities and out-of-school training organizations will become the major force of STEAM education with the influx of social capitals. As the support of government and social powers increases, first and second-tier cities will see vigorous growth of STEAM education and become the major markets of education organizations.

Height four: "going global" trend is continuing to heat up. Driven by policies under the OBOR Initiative, China’s education industry is taking on the trend of "going global", especially vocational schools and higher education institutes. Specifically, as Chinese enterprises have technology advantages with higher cost performance, the export of digital education infrastructure will have the biggest impact.

Height five: educational real estate expands rapidly and the collaboration between real estate and education further deepens. Educational real estate is developing toward cross-sector cooperation. Based on the degree of correlation, such cooperation can be classified as three categories: sponsorship and affiliation, cooperative school running, and independent school running. As the integration of education and real estate deepens constantly, a new mode of education complex will come into being, under which, education will occupy a more important place in real estate.

Height six: technology redefines education and education industry will experience unprecedented transformations. Transformational new technologies such as artificial intelligence, digital technology, virtual reality technology, etc. will shape four trends for education industry: intelligentization, digitalization, three-dimension, and flatization, and create a new personalized and full-immersive education mode with the participation of parents, schools and teachers.
1.1 Preschool education has broad growth space

Two-child policy is favorable to preschool education

Since the full implementation of two-child policy in 2016, China’s new birth population has increased to 17.86 million, that of the second and later-born child also has reached a new high, 8.44 million, and this figure is expected to increase to about 9 million by 2017. The size of preschool education market will further expand. China’s preschool education market, reached a size of about RMB380 billion in 2016, and is expected to exceed RMB540 billion by 2020.

The fast expansion of preschool education market shall mainly owe to two-child policy and post-80s parents’ awareness of early childhood education.

Great interest in purchasing preschool education

The majority of parents who purchase preschool education for their children are under 35 years old. Post-80s parents generally view old education concepts have been outdated and hope their children to receive education as early as possible, so they are more easily to accept early childhood education. Besides, most of them can afford preschool education expenses.


Moving Toward New Heights

Early childhood education
Local early childhood education organizations spring up
As estimated, Chinese early childhood education market will exceed the scale of RMB200 billion by 2017. At the early stage, due to low entry standards, most domestic education organizations couldn't provide quality early childhood education, parents preferred to choose established foreign brands. However, as the education mode of foreign early childhood education organizations can't fully meet the needs of Chinese young children and domestic early childhood education organizations have become standardized and professional, domestic early childhood education organizations begin to spring up. According to incomplete statistics, the search volume of foreign early childhood education brands has dropped from 45% in 2014 to 37% in 2016, while at the same time, that of domestic early childhood education brands has increased by 37%. Now China's early childhood education market is mainly driven by domestic early childhood education organizations.

At present, early childhood education organizations take on two trends: firstly, as the demand of Chinese preschool education increases rapidly, early childhood education companies need to expand to different regions to build nationwide operating networks and incorporating international practices into local teaching. Different regions have different teaching methods and curriculum requirements, so teachers should deliver teaching contents with local characteristics. Secondly, early childhood education organizations begin to expand to maternal and infant industry to build good relationship with parents at the early stage. Based on such solid relationship, early childhood education organizations can have more chance to win those parents in early childhood education market. By providing early childhood education services, these enterprises can expand to maternal and infant industry to build a full industry chain.

Kindergarten
Brand building becomes the only sure way
In 2016, China had 248,600 (an increase of 16,000 year-on-year) kindergartens and the number of kindergarten student increased to 47.25 million. The gross enrollment rate of preschool education reached 77.4%, an increase of 2.4% y-o-y.

The market of kindergarten is widely shared by numerous players, the top five kindergartens altogether only occupy a market share of 2%, therefore, fierce competition among kindergartens is inevitable. With the increase of kindergartens, parents will have more choices. The only way for kindergartens to keep competitive advantage is providing quality education resources and teaching services through brand building.

Medium and high-end private kindergartens will receive benefits
Though with rapid development in recently years, preschool education is still stuck in resource shortage and can't meet social needs. According to the National Outline for Medium and Long-term Education Reform and Development (2010-2020), by 2020, China will implement one-year preschool education across China, basically implement two-year preschool education, and implement three-year preschool education is some regions. In the long run, China is verly likely to incorporate preschool education into compulsory education, as which can solve many problems impeding preschool education including absence of relevant laws and regulations, shortage of excellent teachers, and unsatisfied teaching quality, etc.

Number of kindergarten and kindergarten student (2011-2017E)

Source: Ministry of Education, Deloitte Research

4 Blue Papers of Chinese Early Childhood Education
5 http://www.sohu.com/a/134972099_1872677_f=v2-index-feeds
6 http://news.xhby.net/system/2016/07/14/029172378.shtml
7 http://www.gov.cn/shuju/2017-07/11/content_5209728.htm
8 "The implementation of new Non-state Education Promotion Law is approaching, can education asset generate new M&A opportunities?", http://www.jiemian.com/article/1455451.html
One-year preschool education has been experimented in some provinces and cities, for instance. Nanjing has implemented one-year free preschool education since 2014, and which is expected to be implemented across Jiangsu province by 2020. However, it should be noted that, incorporating preschool education into compulsory education is inevitable in the long run, but it is still uncertain whether this proposal raised by CPPCC members could be adopted. If it will be adopted in the future, considering uneven economic development of different regions, this process should be advanced step by step according to the actual conditions of different regions.

If this proposal is passed, medium and high-end private kindergartens will be the biggest beneficiaries. With the support of more governmental education funds, public kindergartens can improve teaching quality and adopt uniformed teaching and curriculum standards to make their school-running more standardized. Consequently, public kindergartens will be able to replace inclusive private kindergartens with poor teaching quality and social capitals will flow to more competitive medium and high-end private kindergartens.

**Interpenetration of preschool education subjects**

Participants of preschool education market can be divided into three categories: education organizations (early childhood education and kindergarten), informatized enterprises, and product enterprises (textbooks, curriculum and learning materials, etc.). The three categories of enterprises are taking on a trend of interpenetration:

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### New birth population after two-child policy (2011-2017E)

![Diagram showing interpenetration of preschool education subjects]

**Product enterprises** provide curriculums, textbooks, stationaries and other products for the market and expand to other sectors with very attractive IP content. For example, Prokids uses a IP image, Beva, to build a complete system with watching, listening and gaming content. Later, it also cooperates with technology companies to jointly develop software and smart terminals. Moreover, it also develops curriculum system with existed content and adds online and offline resources via cloud platform. It may run offline kindergartens in the future. For instance, RYB has begun to run kindergartens after developing teaching materials and self-owned curriculum system for early childhood education.

**Informatized enterprises** expand into preschool education sector by providing informatized products via early childhood education organizations or kindergartens such as cloud platform. Besides, they can build curriculum system to establish early childhood education organizations engaged in STEAM education. Many STEAM education organizations, including HIT Robot Group, have applied robotics to compile robot training materials and built robotics activity centers and robot labs across the world.

**Education organizations**, including early childhood education organizations and kindergartens, improve brand awareness and expand via franchise operation or regular chain. During this process, they need to connect teachers and students of different schools with informatized system platforms and provide standardized textbooks and curriculum. Most branded preschool education organizations grow as integrated education services providers by such ways.

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9 http://www.njedu.gov.cn/xqyn/wenda.htm
1.2 Diversified development of K12 education

Private education training

Industry giants invest in multiple sectors

Giants in K12 educational training sector have developed their own brand businesses; however, in order to improve market share, gain higher profitability and achieve sustainable development, they have begun to invest in multiple sectors including education intelligentization, multi-disciplinary education, and extended K12 education.

In terms of education intelligentization, industry giants are trying to step into areas including artificial intelligence, robot, big data and VR/AR technology by investing and acquiring companies. Some do so for company and market expansion, some are driven by objective factors: as the mode of “Internet plus education” spring up rapidly, industry giants can’t fall behind technology development of this industry and be trapped in traditional training models; instead, they need utilize education technologies to optimize curriculum experience and the added value of curriculum. For example, in order to apply motion sensing education and artificial intelligence technologies in early childhood education, Tomorrow Advancing Life and XDF jointly finance Heyha Tech and XDF invests in Roborobo. Besides, by introducing a business intelligence platform from BDP in 2016, Only Education uses big data to realize more scientific teaching arrangements and tries to integrate artificial intelligence with big data.

Regarding multi-disciplinary education, based on current businesses, first and second tier companies in various education training sectors are extending discipline layout to English training or general tutoring. Training companies strengthen their weak or inefficient disciplines in K12 education training. For example, Tomorrow Advancing Life acquires First Leap and invests in www.2zkk.com to enhance English training and general tutoring; Longwen Education develops "59" online platform to enrich test bank. These measures can help companies expand businesses, improve market layout, and attract more users.

As for extended K12 education, industry giants are investing in many extended areas including international education, early childhood education, STEAM education, etc. Only Education focuses on expanding international education businesses; Tomorrow Advancing Life invests Baby Tree with an attempt to utilize abundant user (mothers and children) resources to step into early childhood education sector. By extending business layout to more areas, companies can improve business system and broaden market space.

Standardized training mode

The quality of traditional teaching depends on the strength of teachers. So firstly, it is necessary to prevent brain drain and idolization; secondly, teaching mode duplication can fully improve expansion efficiency and create brand effect; and thirdly, lower teacher costs and stereotyped expansion can effectively increase profitability. Therefore, to be more competitive, giants in education training sector need to make the mode of curriculum and management more standardized.

In terms of curriculum, K12 education training companies can create teaching segments, establish fixed teaching processes and innovate teaching mode. For traditional curriculum mode, teacher’s role is maximized, who participate in the parts of teaching research and practical teaching. Splitting traditional parts can weaken teacher’s functions and make teaching more targeted. For instance, XDF divides English courses into segments including listening, speaking, reading and writing and require teachers responsible for different segments to collaborate in providing large English classes. Tomorrow Advancing Life is a typical example, which builds a professional teaching research team and question bank to divide textbooks and teaching progress into detailed levels. Third, innovating teaching mode can make curriculum more irreplaceable, improve learning effectiveness, and promote brand building.
Online asset-light mode expands fastly

In recent years, giants tend to change their operation mode from "asset-heavy" to "asset-light". When entering the markets of third and fourth tier cities, they change the approach of establishing branches to opening broadcasting classrooms with teaching assistants. This approach can reduce fixed costs such as rental and labour, and meanwhile, monitor and help students do excises, exams and evaluations by setting teaching assistants, facilitate the connection of online education resources with students, and guarantee teaching quality.

"Double-teacher class" is a typical example of "asset-light" mode. "Double-teacher class" is a teaching mode consisting of online broadcasting classes chaired by famous teachers in first-tier cities and teaching assistants in third and fourth tier cities responsible for discussion, Q&A, assignment check and knowledge summary. It enables quality education resources to be shared by more students and secures the effectiveness of online broadcasting teaching. As an attempt to enter into the markets of third and fourth tier cities and popularize online teaching, "double-teacher class" relieves the shortage of quality teachers in branch schools. Now, Tomorrow Advancing Life has already earned RMB200 million from "double-teacher class" and XDF already can provide double-teacher class for a dozen of classes at the same time. Both of them have achieved a market value over USD10 billion, for which, online class is indispensable. Following KDF and Tomorrow Advancing Life, other extra-curricular tutoring organizations such as Gaosi Education and Aotu Education have begun to try the mode of "double-teacher class".

By uploading broadcasting or recording quality resources to cloud platforms, problems such as shortage of quality teaching resources and teaching resource imbalance can be resolved. "Asset-light" mode facilitates the integration of online and offline education resources and will become a trend in private K12 education training sector in the future.

1.3 Vitalize the potential of vocational education

Vocational education can be divided into academic and non-academic, by 2017, market sizes of these two segments are expected to reach RMB222.5 billion and RMB528.1 billion respectively. The popularity of "craftsmenship" spirit and great support of central government during the 13th Five Year Plan period will vitalize the great potential of vocational education market. As estimated, the market size of Chinese vocational education industry will increase to RMB1.24 trillion by 2020.

Academic vocational education

Colleges of applied sciences at undergraduate level are in nascent stage

In order to cultivate high-level applied talents and improve the position of vocational schools, the government has begun to establish colleges of applied sciences at undergraduate level by introducing the "dual system" from Germany. "Dual system" refers to a pattern that universities and enterprises collaborate in cultivating talents, under which, students not only receive academic education but also participate in practical work or projects in companies, and enterprises will participate in the whole process of professional course arrangement and performance assessment of vocational schools. For example, to cultivate top professionals for high-end industries, Shenzhen is planning to establish colleges of applied sciences at undergraduate and higher level during the 13th Five Year Plan period. Currently, there are two ways to establish colleges of applied sciences at undergraduate level: one, transformation from undergraduate universities, e.g. the establishment of Shenzhen University of Science and Technology in July 2016 based on applied majors of Shenzhen University; two, upgrade of higher vocational schools to colleges at undergraduate level, e.g. the setting up of Tianjin Sion-German University of Applied Sciences in May 2016 (which is the first college of applied sciences at undergraduate level upgraded from higher vocational school in China). As school running experience increases, vocational colleges at undergraduate level will become a major trend of vocational education.

Vocational education groups accelerates development

Education group has completed industrial system, including higher vocational schools, research institutes, laboratories, technology companies, logistics services companies, etc. Through internal resource cooperation, education group can provide a full set of trainings from education to employment and cultivate excellent professionals for enterprises by adopting the modern system of apprentice. In accordance with the Opinions of the Ministry of Education on Promoting the School running of Vocational Education Groups issued in 2015, China will preliminarily establish 300 demonstrative major vocational education groups by, 2020 (The first vocational education group, Hangzhou Iron & Steel Vocational Education Group has been established). Integrated education, training and employment chains within vocational education groups can provide professional talents with certain skills, relieve the shortage of senior technical talents, improve the technology level of enterprises, and reinforce competitiveness.
School-enterprise cooperation is the only way out
As an important way to encourage social force to participate in vocational education, school-enterprise cooperation has become an important development direction of academic vocational education in the 13th Five Year Plan period. Since the Work Priorities of Vocational Education and Continuing Education in 2016 proposes to develop incentive policies on school-enterprise cooperation, now the Measures for Promoting School-Enterprise Cooperation is under preparation.

School-enterprise cooperation has two connotations: first, promote the exchange between teachers and enterprises. The Opinions on Implementing the Plan of Improving the Quality of Teachers for Vocational Schools (2017-2020) requires principals and teachers of vocational schools to attend national trainings and participate in at least 4-week practices in enterprises and supports vocational schools to hire senior technical talents as teachers.

Second, vocational schools cultivate talents for enterprises. The way that enterprises cooperate with higher education institutes is different from that with vocational schools, the former is cooperation based on underlying technologies and the latter is based on specific projects.

Non-academic vocational education

Internet platform reforms traditional teaching method
At present most online vocational education organizations have transformed traditional teaching methods characterized with fixed time and place and are able to provide services like video courses, online materials and online Q&A to meet learning needs at any time and any place. As online teaching and online courses/courseware have taken over 60% of shares, more people gain the access to quality learning content at lower prices. With the development of education technology, internet education can provide users with self-adaptive learning systems. Self-adaptive learning system can collect learning data of users via the back office at any time such as learning time and accuracy, adjust learning pace based on user’s learning status, and offer personalized services so as to improve learning effectiveness.

Normalization of vocational education training market
At the early stage of non-academic vocational education, because of low entry standards and lack of regulation, many training organizations could not provide qualified services and were involved in false propaganda. As the market develops, a batch of highly identifiable enterprises emerge in various areas of vocational education training market, which, to some degree, have contributed to orderly development of the market. The new Non-state Education Promotion Law will further tighten the supervision of governmental departments on the market. For example, Yangzhou has closed some training organizations without operation permits to normalize private education training market. The implementation and advance of regulatory systems will make non-academic vocational education market normalized, eliminate illegal and unqualified enterprises, help fine enterprises win competition, and improve the level and efficiency of the market of vocational education training.

Teaching methods of online vocational education

Source: China Online Education Research Institute, Deloitte Research

15 http://www.moe.edu.cn/srcsite/A10/s7011/201611/t20161115_288823.html
1.4 Cross-sector investments into international schools

Due to fast increase of education fees and school number, Chinese international school market develops rapidly, making CAGR exceeding 18% from 2011 to 2016. From 2011 to 2016, the number of international schools increased from 372 to 737, and will increase to around 1,000 as estimated by 2020\(^\text{17}\), among which, private international schools will achieve the fastest growth, increasing from 100 to 392. In the future, the Non-state Education Promotion Law may help increase private international schools. Currently, the market of private international school is experiencing a series of transformations.

Enterprises scramble to make cross-sector investments into international schools

Over the past six months, enterprises in various sectors have made substantial investments into private international schools. For instance, Alibaba invested RMB1.3 billion to build Yungu International School in February 2017; and in the same month, a subsidiary of Jiangsu Zhongtai Steel Structure Co. Ltd. acquired Kaiwen Ruixin to establish Beijing Chaoyang Kaiwen Academy through fundraising; Huawei invested international education by co-founding A+W Academy with Tsinghua University High School in this March.

Since the expansion of middle class has increased the demand of quality international schools, enterprises scramble to make cross-sector investments or establish international schools. Besides, more importantly, as the Non-state Education Promotion Law provides legal basis for the securitization of non-compulsory education, international education sector will see opportunities. More and more enterprise will make cross-sector investments into international schools under the encouragement of governmental policies.

\(^{17}\) NewSchool Insight, http://science.china.com.cn/2017-05/26/content_9497547.htm
Enhanced collectivization trend
The market size of private international school expands rapidly and the number of independent schools slimbs, telling that domestic market is still in growth period. A batch of international school education groups have been established in China such as Bright Scholar Education Group, Maple Leaf Educational Group and Huijia Education Group (which focuses on international kindergartens). For instance, Bright Scholar Education Group runs 6 international schools and will set up more international schools in Guangdong, Henan, Malaysia, etc. As existing international school education groups expand, a trend of collectivization trend is shaping: fast growing private international schools will develop as education groups in China, while foreign international schools will remain independent in school running.

Asset-light mode
Under asset-heavy mode, private international schools have to buy land for establishing new schools with their own money. Such mode requires a large amount of money because of great initial investments. Moreover, because of some limits on land for education purpose, they have to hold such land for a long time. However, if adopting asset-light mode, they will only need consider teacher recruitment and daily operation since their partners will pay for land purchasing and school construction.

Under asset-light mode, international schools can cooperate with local governments, real estate companies and private schools. Regarding the first choice, local governments provide land and classrooms and international schools are responsible for teaching management and operation by utilizing their own education resources, so they can spend their own money on optimizing teaching and management. With increasing popularity of PPP mode in education industry, the cooperation between governments and international schools will be more popular. For example, the education industry park and Weifang Experimental School of Beijing Normal University in the PPP project cluster of Weifang, Shandong province18. The International School of Guizhou High-tech Area, Ruanshi International School in Chishui, Sichuan, the international education program from kindergarten to junior high school in Dalian New Airport Business Area, and the International Education City of Western China co-founded by China First Capital Group Limited and Deyang city in Sichuan Province19.

Integration trend of Chinese and Western courses intensifies
Considering the demands of many parents for diversified education, international schools are transforming curriculum systems from totally western style to an integrated style. Through integration, students can learn traditional Chinese culture and receive examination-oriented education at the same time. Besides, in order to accord with the trend of localization, a new mode of "Chinese culture plus" has been put forward, which offers various courses including Chinese history, traditional dance, handicraft arts, calligraphy, traditional Chinese painting, etc. Some international schools have begun to make explorations such as Vanke Meisha Academy and Beijing Peide International School20.

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18 http://www.sohu.com/a/120759254_380485
19 Blue Whale Education
21 Survey by NewSchool Insight: International Kindergartens are in short supply with increased quantity and quality https://www.jiemodui.com/N/80260.html
22 China’s Private Vocational Schools Trapped in Several Living Dilemmas: Lacking Students Internally and Suffering Discrimination Externally http://news.xinhuanet.com/politics/2016-12/12/c_1120100791.htm
1.5 Private schools continue steady growth

Private kindergartens take a lead in private schools

During the period from 2011 to 2016, the number of private schools continued to grow from 130,000 to 170,000, with a compound annual growth rate of 5%, which was contributed by the following three factors: Firstly, education policies encourage capital to participate. With the implementation of the new Non-State Education Promotion Law in September 2017, the rule of classification management on private education will be established and private schools could change into for-profit ones, which drives capital to chase private schools. Secondly, the public education resource is distributed unevenly. High-quality public education resources always concentrate on developed areas such as first-tier cities and provincial capitals instead of undeveloped areas. However, private education could fill a vacancy in those areas. Thirdly, market demand is diversified. Private education enjoys much more autonomy and flexibility than public education, able to meet diversified requirements of parents.

The development of private schools in different phases was uneven in recent five years, proved by the large gap between private kindergartens and private secondary vocational schools. From 2011 to 2016, private kindergartens grew fast with the highest compound annual growth rate of 6%, meanwhile, private secondary vocational schools suffered a decline with a compound annual growth rate of -5%.

The loosening of two-child policy and the large gap in respect of number and quality between public kindergartens and private kindergartens lead to the rapid development of private kindergartens.

By comparison, the number of private secondary vocational schools has decreased from over 3,000 in 2011 to about 2,000 in 2016 due to the following two reasons: The first is disordered management and non-standardized school running. There are some irregularities in some private vocational schools, such as fault advertising, recruiting students with much money and forcing students to intern, which results in student drain. The second is unfavorable policies. Private schools cannot get the same funding from government as public schools do, which undermines their competitiveness somehow.
1.6 New Non-state Education Promotion Law accelerates education asset securitization and the transformation of private education institutions

Asset securitization and acquisition of high quality assets speed up

New Non-state Education Promotion Law stipulates to conduct classification management for non-profit private schools and for-profit private schools and allows for-profit private schools to participate in non-compulsory education programs. For-profit private schools shall exist in the form of company, which enables they have more freedom in terms of incentive system and charging limitations, etc, while removes obstacles in education asset securitization, bringing new development opportunities for private education industry.

Currently, the securitization ratio in domestic education industry is lower than 5%, due to the fact that “not-for-profit” education asset does not comply with the requirement that securitized assets should be business assets with clear property right.

New Non-state Education Promotion Law has removes the obstacles in securitization for private schools, benifical to for-profit private schools at non-compulsory education stage, especially those engaged in preschool education, vocational education and K12 extra-curricular tutorial classes. This is mainly due to these education institutions have clear asset ownership and tax policy, easier to meet listing requirements. Since the end of 2016, the IPO of education institutions has accelerated and after the implementation of the new law, private schools will realize asset securitization in A-share market. In terms of acquisition, much capital speeds up into private education field to make more and more acquisitions. For example, Kaiyuan Instruments Co., Ltd. acquired 100% share of Hengqi Education hold by Shanghai Hengqi Education Training Co., Ltd.; Naning Baiyang Food Co., Ltd. acquired 100% share of Mars Era by share issuance and cash payment.

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24 Is Education Asset the New M&A Focus? http://www.sohu.com/a/155291783_722826
Increasingly strict supervision on qualifications drives transformation

According to the previous Non-state Education Promotion Law, to run a private school, permit in school running is not a necessity. Instead, the school only needs to put on records in industry and business authority or education authority to register as a technology company or an education consulting company. The two types of company are governed by different authorities, which would lead to weak supervision.

While, the new version mandates for-profit private schools to obtain the permit and put on records in trade and industry bureau and defines education training institutions must operate under the supervision of both education bureau and trade and industry bureau. That is to say, after 1 September, 2017, there will be more risks if the institution runs without the permit. And it also means the government increases supervision on for-profit private schools.

Considering the increased supervision, partial education training institutions have initiated transformation to develop toward diversity. In addition to traditional cram classes, they also set foot in sport, offering classes related to football and badminton, etc. Ceratin examples can be found in Guangzhou, where some education institutions have already cooperated with Guangdong Star Football Club and Dong Hu Qi Yuan to seek their support in teacher, venue and others. 25

The implementation of new law will go through a long period

Though the new law will take effect in September 2017 and local governments are continuously promoting opinion collection, the implementation of new law will go through a long period and will not make dramatic changes since its effective day. Two main factors play a part in it. Firstly, the following legislative process will last one to two years, including the time for Implementation Regulation for Non-state Education Promotion Law amended by State Council and supporting regulations formulated by Ministry of Education and local governments. Secondly, non-profit private schools applying for changing into for-profit schools needs the approval of local education commission, especially those schools at compulsory education stage will encounter more difficulties in the course of application. Due to the process of policy implementation differs in regions, thus the specific time cannot be determined yet. It is estimated that there will be no substantial progress in 2018. 26

25 Guangzhou: Private Education and Training Institution will Operate Under Strict Supervision  
http://news.xinhuanet.com/ttgg/2017-05/17/c_1120984424.htm

26 After the implementation of Non-state Education Promotion Law and relevant rules, where is the possibility of education capitals? http://www.sohu.com/a/131407919_460424
Trend two: Capital market is gaining ground

The year 2016 saw a surge of education capital, and M&A, asset securitization, and investment showed varied trends of development. Acquirers entered the education industry seeking for a more robust profitability mode. Asset securitization was accelerated in the New Third Board, A-share market and overseas stock markets, pushing the asset securitization process to a peak. Investors were taking an increasingly rational attitude to evaluate investment projects, financial sustainability, and return on investment.

2.1 Cross-sector M&As become the norm with M&As soaring

Number of M&As reached a new high

The total amount of M&As in China’s education industry exceeded RMB12.6 billion in 2016, with a compound annual growth rate (CAGR) of up to 78% over the past four years. In the first half of 2017, the number of M&As reached 71 cases, with a total amount of RMB8.924 billion, 3.62 times that of the same period last year. In addition, average single investment scale increased significantly. In 2016, the average transaction amount of a single merger for education industry was RMB690 million, which nearly doubled that of RMB355 million in 2015. In December 2016, Kingsun Shares spent RMB2.9 billion on the acquisition of Aidi Education, the largest acquisition record of the year in the education industry.

From the perspective of industry segments, capital mergers and acquisitions in 2016 concentrated on education informationization, the number of M&A cases in this sector accounted for 21% of total M&As, and the figure grew to 30% in the first half of 2017. The main reasons could be summed up to two points: first, there is huge market demand for necessary infrastructure along the path of internet-based transformation of traditional education, and education informationization plays a supplier role of extreme importance; second, the state’s 13th Five-Year Plan highlighted the development of education informationization. In 2016, education informationization became the focus of large listed companies in expanding their education layout, involving an amount of around RMB5 billion. Of which, Shanghai 3F New Materials spent RMB2.26 billion on the acquisition of two education informationization companies, AVA and Eastedu, creating the record of the year in education informationization sector in terms of M&A amount. In the first half of 2017, the amount of education informationization M&As reached RMB475 million, accounting for 16% of the total amount. Moreover, there were also frequent M&As in K12 extra-curricular training and education integrated services sectors. M&A amount of education integrated services sector in 2016 reached RMB4.6 billion, second only to that of educational informationization. M&As of K12 education sector also significantly increased, with a total M&A amount of RMB2.275 billion from 2016 to the first half of 2017.
Cross-sector M&As boost transformation
Among 139 M&A sponsors from 2016 to 2017, top three of whose original main business were manufacturing, education, and computer application services, of which the manufacturing and education industries combined accounted for 80%.

Cross-sector education M&As are motivated by the urgent demands of non-educational listed companies for transformation: In 2016, the increased overall downward pressure on domestic economy posed challenges to all industries in terms of survival and profitability. With the strong rise of technological education, especially that various emerging projects in “Internet plus education” sector had successfully monetized by acquiring clients and traffic, education industry developed like rushing torrents with steady business operation in overall and became the opportunity for the transformation of listed companies. Most of the listed companies setting foot in education are traditional manufacturing enterprises with overcapacity whose market values have not performed as desired as impacted by intense competition and industry structure and thus expect to transform through cross-sector education mergers and acquisitions.

Amount of education M&As in China (2016-June 2017, RMB100 million)

Distribution of main business categories of M&A sponsors

Source: Wind, Mergermarket, Deloitte Analysis
Note: incomplete statistics
2.2 Asset securitization rises positively

Education asset securitization rises in overall

Domestic education asset securitization (the New Third Board, A-share market and overseas stock markets) accelerates as reflected in two aspects: firstly, the number of asset securitization of educational enterprises continued to grow from 45 cases in 2015 to 69 cases in 2016. In the first half of 2017, the number of asset securitization of new educational enterprises reached 64, a new high in recent 10 years, of which the growth performance of the New Third Board caught the most attention. Secondly, after asset securitization, the revenue and scale of education enterprises all increased rapidly. Combined revenue of the 140 listed companies that had published their annual reports as of May 2017 exceeded RMB13.6 billion in 2016, of which, 34 companies achieved a revenue exceeding RMB100 million, with the highest revenue reaching RMB1.922 billion; these listed companies achieved an total annual net profit of nearly 1.6 billion, and more than 80% saw increases in revenue scale. 

Quantity and distribution of listed education enterprises (2008- July 2017)

Source: Wind, Deloitte Analysis

27 Sina Financial Securities Times
A-share market enterprises accelerate asset securitization
The momentum of listed enterprises spending large amount of money on acquiring education assets continued in 2016, and another four enterprises engaging in education were listed on the Main Board Market throughout the year. Three trends suggest that scale of education assets in on the Main Board Market will continue to expand in the future:

Technological education continue to penetrate: In 2016, the toy tycoon LEGO acquired an internet education company Fan Ai Zhong, moving from a development mode of single toy industry to a "toy + connected education" double main business development", and focused on expanding its layout in intellectual education platform and education informationization services. Printing industry giant Shengtong Printing acquired the leading enterprise of STEAM education Lebo Education at RMB430 million and became the No. 1 STEAM education stock in A-share market. Benefited from the penetration of innovative technology, education industry will still erupt continuously reforms. The technological education led by "Internet plus education" is expect to be the new main force driving the A-share market.

Political bonus catalyzes stock capitalization: At present, there have been 55 enterprises engaging in education industry, a number of which lacked pure education targets but dabbling education industry through cross-sector M&As or shareholding. Leading education enterprises in the real sense remain few on the A-share market. The new Law on the Promotion of Private Education effective from 2017 will remove the obstacles for education asset securitization, plus the obvious acceleration of IPOs, A-share market will probably see a new wave of asset securitization by education enterprises.

Enterprises delisted from overseas markets return to domestic A-share market: From 2011 till present, three education enterprises listed in the US have completed their privatization, of which Xueda Education became the wholly owned subsidiary of Yinrun Investment and returned to the A-share market from NYSE. Overseas capital markets have strict requirements for the governance structure and subsequent financial regulations of listed companies, many of the US-listed education enterprises are delisted as a result thereof. Returning to the domestic Main Board Market is likely to be a option for the delisted enterprises.

Private schools are seeking for IPOs in Hong Kong stock market
Since 2016, Vrsced Education, Wisdom Education, Yuhua Education, Minsheng Education and China Higher Education Group has been successfully listed on the Hong Kong Main Board. Plus the Maple Leaf Education that was listed in Hong Kong stock market in November 2014, private education enterprises from the Chinese Mainland are clustering in the Hong Kong stock market. Private education enterprises listed in Hong Kong stock market convert tuition fees received into operating revenue of the listed companies by means of a structural contract signed between the companies registered in the Chinese Mainland and foreign-registered companies.

Business scope concentrated on kindergartens, K12 education and higher education: The six listed private education enterprises have different focuses in terms of the scope of business. Maple Leaf Education and Wisdom Education mainly focus on kindergartens and K12 education, and Minsheng Education and China Higher Education Group specialize in higher education, while Vrsced Education and Yuhua education adopt a compound pattern of "kindergarten plus K12 plus higher education" business model. Enrollments and the tuition data of the six schools suggest that higher education schools are dominant in enrollments compared to K12 education schools, while K12 education schools have a higher tuition per capita.

The reason of private schools clustering in Hong Kong stock market is that old policies are hindering asset securitization: Before the amendment of the Law on the Promotion of Private Education, private educational schools in China were still non-corporate private organizations, which were not part of operating assets of company nature and could not be listed in the capital market through IPOs. Therefore, most private schools adopted a VIE architecture and go public in the Hong Kong and US stock markets. Of the six enterprises listed in Hong Kong stock market, Maple Leaf Education and Vrsced Education mainly focus on operating international schools, and Wisdom Education is also involved in this field. As surveyed by NewSchool Insight, with a strong demand for international schools, there has been 737 international schools in China by 2016, with a total number of students reaching 430,000. The new Law on the Promotion of Private Education, which passed the third review in 2017, will probably change the pattern that educational enterprises cluster to go listing overseas.
Vocational education and informationization lead the listings on the New Third Board
Fast with low costs and few political restrictions, and advantaged with finance pricing and trading functions, listing on the New Third Board is widely favored among small and medium growth enterprises. From 18 in 2014 to 42 in 2015 and 62 in 2016, the number of education enterprises listed on the New Third Board grows gradually. In the first six months of 2017, another 20 enterprises were listed on the New Third Board, making the total number of listed education enterprises up to 150 at present, while at the end of 2015 the number was only 68. In other words, the number of listed education enterprises has doubled in less than one and a half years since 2016. Currently, the following four fields are mostly favored by capital in the New Third Board market:

1. Cast a wide net in market segment of vocational education: Listed enterprises focused on vocational education account for a quarter of all education enterprises listed on the New Third Board market, of which enterprises with a firm foothold start to build their comprehensive training platforms. Enterprise talent training targeting at staff creativity and cohesiveness also become popular, followed by IT training, financial training, art training, and mechanical automotive training. A number of enterprises also emerge in innovation area that closely follow social demands and engage in aviation, luxuries, martial arts, psychology, etc. spreading the net of specialized vocational education to wider range of fields.

2. Educational technological improve online education: As the main force of education enterprises resident on the New Third Board, education informationization enterprises remain to be a “must-have” of an intelligent and digital campus. A great number of high-tech R&D enterprises, after realizing business upgrade taking the wind of education informationization in 2015, turn their eyes at online education. With advantages in cloud computing, data management, and technological R&D, aiming at the pain points of unmet demand for and limited utilization of education resources, etc., high-tech R&D enterprises assist internet-based education platforms in continuous innovations and change the education model of traditional K12 extra-curricular trainings and vocational qualification trainings. High-tech R&D enterprises have also developed innovative human-computer interactive high-tech products which gain popularity in vocational education, early childhood education, vertical platform and other fields, improving the educational experience.

2.3 Equity investments are back to rationality
The period for extensive growth of equity investments in China’s education industry has become the past, and it is now the period of transformation. In recent years, investment cases and the scale of the total transaction in the education industry has shown a leap-forward growth. This trend, however, suddenly ended in 2016. Total amount of investments in 2016 reached RMB11.861 billion, a decline of 25% compared to RMB15.9 billion in 2015. These investments were distributed in 234 cases, a decline of 13% compared to 270 cases in 2015. From January to June in 2017, domestic education industry received a total investment of RMB4,284 million with 93 cases.

Amount and number of investments in education industry (2013-June 2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total amount (RMB100 million)</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>2015</td>
<td>180</td>
<td>250</td>
</tr>
<tr>
<td>2016</td>
<td>140</td>
<td>200</td>
</tr>
<tr>
<td>2017.6</td>
<td>100</td>
<td>150</td>
</tr>
</tbody>
</table>

Source: Zero2IPO, IT Juzi, Deloitte Analysis
Technological education becomes a new favorite of investment and the heat in vertical platform and vocational education continues

Education investments mainly focus on technological education, vertical areas (language and interest), vocational education and early childhood education.

<table>
<thead>
<tr>
<th>Amount and number of investments in education industry (2016-June 2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet plus education</td>
</tr>
<tr>
<td>Self-adaptive learning</td>
</tr>
<tr>
<td>Robotic education</td>
</tr>
<tr>
<td>Somatosensory education</td>
</tr>
<tr>
<td>Language training</td>
</tr>
<tr>
<td>Intelligent home-campus platform</td>
</tr>
</tbody>
</table>

Technological education (24.8%)  Vocational education (22.3%)  Vertical platform (21.7%)

Early childhood education (10.7%)  Traditional K12 extracurricular tutoring (7.6%)

Education informationization (9.8%)  Studying abroad (3.1%)

Source: Zero2IPO, IT Juzi, Deloitte Analysis

Technological education – emerging technologies catch up from behind

Taking the opportunity of intelligent and digital technology, technological education rapidly opens up a new world in investment field. As excellent teacher resources fail to meet the needs of students, O2O double teaching mode has become one of the most effective ways in "Internet plus education". A variety of knowledge and skills sharing platforms, live streaming knowledge communities, big data and cloud courses are emerging, not only impacting the traditional K12 extra-curricular training for students but also expanding the audience of online education to college students and ordinary adults. Within the “Internet plus education” sector alone, there are 44 investment cases, accounting for 15.4% of all investments, and half of the investments in technological education.

Meanwhile, virtual technologies dominated by VR (virtual reality)/AR (augmented reality) have rapidly expanded from technology industry to education industry. VR technology is mainly used in vocational education, giving rise to new popular fields such as training VR talents, researching and developing VR courses, developing VR technology and application scenarios, etc.; while AR technology is mostly used in early childhood education.
It is striking is that "adaptive learning" born out of the demand to cope with inefficiency of online education has been increasingly drawing the attention of capital market. Education companies such as SmartStudy, Yixue Education, Limi Study, Mofangge, LangBo, and Xueba Class are active participants in the race to develop adaptive learning systems in order to seize the opportunity and enhance competitiveness and user loyalty with individualized learning design.

In addition, STEAM education, maker education, robot-based education, motion sensing application in education, and 3D technology application in education, etc. have attracted more interest of the capital market. Under such background, technology application in education is expected to embrace more development opportunities in the future.

**Preschool education:** Early childhood education, at the stage of stable bull market, witnessed 32 investment cases in 2016, with total account raised slightly higher than that of 2015. Benefited from last year's craze for AR early childhood education, NEOBEAR which had created an AR product sales record of over RMB100 million in three months, raised RMB250 million in series B round in 2016. At the same time, “IP craze” has also spread from screen culture to early childhood education. "IP plus AR" is likely to enable hundred-billion early childhood market. In addition, innovative enterprises such as Future Kingdom are gaining momentum. Future Kingdom's children theme parks that promote learning through experiencing may become another popular field of investment in early childhood education.

**Vocational education:** Investment cases in vocational education amounted to 65 in 2016, of which 50% were oriented to IT training. With the surging demand for technology education, IT training is still popular and will undoubtedly continue to be the mainstream in the future. Vocational education related to medicine and finance that used to draw great attention in 2015 is still popular now. Innovative trainings related to job hunting, art, enterprises and civil service examinations are also showing progressive momentum. Besides, plenty of start-ups are stepping in agriculture, psychology, teaching, automobile, cell phone repair and other sectors. Continuous attempts in various sectors in recent years suggest that vocational education may cover an increasingly broad range of sectors in the future.

**Vertical education:** Among the 67 online vertical education financing cases in 2016, 39 were related to language training, accounting for more than half of vertical platforms; whereas the total amount raised from financing in language training dropped by nearly 50% compared with that of 2015. Such significant downward trend is mainly attributed to a language education market that is growing to maturity. Test banks, O2O family education products, and language tools that used to be popular in the market are undergoing transformation to explore viable profit mode; most online education programs using foreign teachers are also yet to make a profit. It suggests that the focus of capital is gradually shifting from product diversity to investment returns. It is worth noticing that most of these language training projects concentrate on English training for children. Public kindergartens seldom impart knowledge, yet entrance examinations organized by mid-and high-end private elementary schools imply the high requirements of such schools for the English level of children. The gap resulted from such situation has motivated high market demand. Thus, compared with adult foreign language training market, the children English training market holds more tremendous potential and will experience a brand building process to establish an immersion-style, interest-oriented and diversified education mode which is more applicable for children's English learning and can better meet parents' demand.

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Trend three: STEAM ushers in a golden age

3.1 STEAM is gaining momentum

STEAM is gaining momentum in China

STEAM is the acronym of science, technology, engineering, art and mathematics. STEAM education represents a new educational trend which focuses on problem solving, emphasizes the training of cross-subject thinking and advocates multi-subject integration.

The concept of STEAM is developing continuously through three stages from STEM to STEAM. The core of change is the extent of art involvement. STEM is first proposed to solve the problem of labour shortage through the integration of science, technology, engineering and mathematics to handle practical problems. Art is not taken into consideration in this stage. To solve the lack of industrial design and improve competitiveness, governments promote STEM2.0 by adding art and aesthetics to STEM. At the stage of STEM3.0 which comes into being based on the endeavour of people from educational industry, art plays a more important role in STEM courses and serves as the entry point of STEM education to improve students’ innovation ability.

### STEM developing stages:

<table>
<thead>
<tr>
<th>Application by governments</th>
<th>Promotion by people from educational industry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEM 1.0</strong></td>
<td><strong>STEM 2.0</strong></td>
</tr>
<tr>
<td>Original/pure STEM</td>
<td>The factor of design is added</td>
</tr>
<tr>
<td><strong>Background</strong></td>
<td>• Lack of STEM labor</td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>• Work</td>
</tr>
<tr>
<td><strong>Core principles</strong></td>
<td>• Integration of science, technology, engineering and mathematics</td>
</tr>
<tr>
<td><strong>Major contributions</strong></td>
<td>• Projects for specific purposes – Integrate and leverage mathematics and science with engineering design methods to create skills and methods to handle practical problems</td>
</tr>
<tr>
<td><strong>Course examples</strong></td>
<td>• Robots and programming</td>
</tr>
<tr>
<td><strong>Extent of art involvement</strong></td>
<td>• Pay no attention to art</td>
</tr>
</tbody>
</table>

Source: Deloitte Research
During the present transition process from stage II to stage III, China carries out pilot programs and provides educational funds, supported by relevant policies issued by governments of all levels. A series of national, provincial and municipal policies have been released to promote STEAM education, including the Thirteenth Five-Year Plan, Notice on the Implementation of STEM Education Pilot Programs released by Jiangsu Province, under which 26 pilot schools are to be opened, and Three-year Action Plan for the Promotion of Technical Innovation Education in Primary and Middle Schools released by Shenzhen. Supported by these policies, STEAM education has been rolled out rapidly in tier-one cities with more than 100 pilot schools opened in Beijing, Shanghai, Shenzhen and other cities. Meanwhile, the market sees the number of the institutions participating in STEAM course research growing continuously, significant money inflow into STEAM education, and social training institutions acting as the mainstay to apply STEAM education. With the intensive development of STEAM education and the market saturation in tier-one and tier-two cities, tier-three and tier-four cities in the western region will become the key areas that institutions compete for.

Participants in STEAM education ecosystem include students, supporting institutions, schools, equipment suppliers and course providers:

### Participants in STEAM ecosystem:

**Equipment suppliers**
- Robots
- Toys
- Internet of Things
- 3D printers
- Drones

**Course providers**
- Training institutions
- Content suppliers

**Schools**
- Public
- Private
- International

**Supporting institutions**
- Governments
- Companies
- Non-governmental organizations

**Students**
- K12
- Junior-high students
- Senior-high students
- College students

Source: Deloitte Research
Students: It is most appropriate to apply STEAM education to senior-grade students of primary school and junior-high students. Students of kindergartens and junior grades in primary schools cannot meet STEAM’s requirements for practical abilities and critical thinking, thus they can only take part in certain STEAM toy assembling and elementary robotic courses, while core courses are not yet suitable for them. For high-school students, subject to the pressure of the College Entrance Examination, they have neither time nor motivation to take part in STEAM education which has no impact on their performance in the College Entrance Examination.

Supporting institutions: Supporting institutions are mainly oriented to public schools. Governments promote STEAM education by releasing policies to instruct the establishment of pilot schools. Companies are also taking active measures to obtain a share in the public school market. Pearson Education Ltd. of Britain, for instance, provides STEAM education courses for Bayi High School. Non-governmental organizations take part in STEAM education through involvement in governmental policies. For example, Shanghai STEM Center provides STEAM courses for schools.

Schools: Benefited from favourable governmental policies and preferential rights to receive fund support, public schools are more motivated to provide education for all-round development of students, thus can embrace most smooth application of STEAM education. Considering return on investment, private schools pay more attention to students’ examination results. International schools have long ago incorporated STEAM as a core educational component, in line with the global trend.

Equipment suppliers: Examples of STEAM equipment include robots, toys, Internet of Things, 3D printers and drones. Robots and Internet of Things are of greatest potential for being able to meet the learning needs of students at different grades and provide sound course systems. Due to the safety consideration and high requirements for space, the growth of drones is the slowest.

Course providers: Course providers include 2B institutions providing courses for schools and 2C institutions directly providing courses for students, represented by Bitlab and ROBOROBO. 2C institutions have a bigger customer base, as they are oriented to all schools and students. Besides, as it is easier for institutions to access to market than to public schools, 2C institutions are able to realize fast expansion. Therefore, 2C institutions embrace more considerable opportunities than 2B institutions.

3.2 Positive development of STEAM education in school and social markets

Double factors drive STEAM education development

1.1 Governments of all levels have released policies to facilitate STEAM education development.
   - In 2015, Thirteenth Five-Year Plan first mentioned STEAM education and Maker education.
   - But local governments and schools are not considering STEAM education promotion as an essential task.

1.2 Developed eastern coastal areas are carrying out pilot programs.
   - Pilot STEAM programs are implemented in schools especially in tier-one coastal cities.

1.3 People are aware of the advantages of STEAM education.
   - Parents want to equip their kids with competitive advantages and they are able to afford the cost.
   - There already exist STEAM investment and M&A cases in the market, though such trend is still mild.

1.4 STEAM related products have entered the market.
   - STEAM education products in Chinese market mainly include five types: robots, toys, Internet of Things, 3D printers and drones.

Source: Deloitte Research
Favorable policies released by governments of all levels
In 2015, the central government introduced the strategy of “mass entrepreneurship and innovation”, and first mentioned STEAM education in the Thirteenth Five-Year Plan, which marks the focus shift of educational policies to the development of innovative talents with competitiveness. However, such state-level policies are not compulsory, do not include specific plans for the implementation of STEAM education nation-wide. It is up to the local governments and schools to decide whether to apply STEAM education. Jiangsu Province has made specific plans for STEAM education implementation, under which 26 pilot schools were opened in 2016 with the cooperation between Jiangsu Provincial Department of Education and Jiangsu Association for Science and Technology. Tasks of these pilot schools include developing STEAM courses, building excellent teaching team, establishing STEAM labs open to the public, assisting non-pilot schools in carrying out STEAM education programs and introducing the concept of STEAM through media.

Developed costal areas take the lead in carrying out pilot programs
With policy support from governments of different levels, STEAM education are implemented in schools especially in the economically-developed eastern region. The development of STEAM education is showing a trend of polarization, with the western region falling far behind the east region.

Eastern region: Self-reliant and fast development. Tier-one and tier-two cities in eastern region can independently develop STEAM education based on affluent money and resources. Vigorous financial support prompts the priority of STEAM education in eastern region, with pilot programs carried out in Shanghai, Shenzhen, Hangzhou, Nanjing, Wenzhou and Beijing. There are more than 100 primary and middle pilot schools in Shanghai.

Western region: Backward development reliant on eastern region. While STEAM education is well accepted in eastern region, it remains a new concept in the western and central region where the educational departments still focus on general education. The main reasons for the absence of STEAM education in remote areas lie in: First, schools in remote areas are unable to afford the expense. Without sufficient budget or resources, they have to rely on the limited financial funds provided by local governments and the support from tier-one and tier-two cities. Second, traditional teachers are unable to instruct on cross-subject knowledge, resulting in lack of STEAM education talents.

People are aware of the value of STEAM education and investment funds are tiptoeing into the area
With the expansion of middle class, parents are more capable of affording education expense. Meanwhile, the wider acceptance of STEAM education has also driven the education investment to tilt towards STEAM education. It is foreseeable that the middle-class proportion will experience a rapid growth in the coming 10 years. With the continuous improvement of purchasing power of post-70s and 80s parents, the monthly expense on educational products will also increase. The traditional score-oriented education is subject to the disruptive influence of education for all-round development. Better recognition of STEAM education will also encourage parents to increase their investment in STEAM education. Since the price of STEAM products usually exceeds RMB500, the high-income families will become the main consumers of such products in the market.

Closely following the education development trend, investors are tiptoeing into the STEAM education industry, with most funds flowing into early childhood education. For example, Shark Park gained more than RMB10 million through series A round in 2014; Miaozhua raised RMB10 million through pre-A round financing in 2015; and Puppy Technology obtained RMB10 million through pre A round financing in 2016.
Public schools hold most potential compared with others in the school market

STEAM education is targeted to two markets, school market and social market. The direct consumers in school market are schools which use their own funds or financial funds from the government to carry out STEAM education programs, including course introduction, teacher training, experiment material purchase and lab building, etc. The direct consumers in social market are students and parents. Parents who choose training institutions and STEAM products are the direct payers.

Schools in the school market are generally classified into public schools, private schools and international schools by nature. Public schools are of greatest potential in STEAM education development due to their nature, courses and social support.

From the perspective of nature, private schools are still focusing on test performance of students, showing little enthusiasm for STEAM education, as the existing College Entrance Examination system is the only way for students to get permitted to elite schools, and parents pay more attention to students' performance in examinations. Therefore, under the pressure to recruit students for profitability, most private schools still take the examination performance-oriented teaching methods, disapproving of STEAM education which has little connection with the enrollment rate. Unlike private schools and international schools, public schools are not profit-oriented and are subject to less cost pressure of running schools, thus are more likely to implement STEAM education. In addition, public schools are more easily affected by educational policies. Therefore, educational departments carry out pilot STEAM programs mainly in public schools.

From the perspective of courses, public schools and private schools hold more potential of STEAM education development because of different educational systems. Public schools and private schools are still applying traditional teaching by subject. They need to rebuild their course systems, teacher resources and infrastructures once they apply STEAM education. International schools mainly provide A-Level, AP and IB courses, introducing courses from foreign countries, and have already involved STEAM as core courses.

From the perspective of social support, public schools have advantages that the other two types cannot compete with. In the process that educational authorities response to the national call to promote STEAM education development, the public schools are bound to be the main force due to their nature. Besides, it is easier for public schools to obtain support from governmental institutions of all levels, semi-governmental institutions (e.g. Science Associations), domestic companies (e.g. Bitlab), foreign companies (e.g. Pearson) and higher education institutions, which are encouraged by governmental initiatives. However, most private schools and international schools can only seek for external support with their own resources.

2C training is identified as the most potential service in the social market

2B and 2C are the two main business modes adopted by training institutions which play an important role in the social market, for STEAM education, with 2C holding the most potential.

Target audience: 2B institutions' clients are 2C training institutions and schools, of which public schools take the majority. Numerous and scattered public schools need separate connection, resulting in difficulties for large-scale admission. 2C training institutions, however, target students without separate connection with each one. As long as their features are formed, they can duplicate the business mode to expand rapidly. Students from public schools, private schools and international schools are all potential clients of 2C institutions.

In addition, in order to save cost and shape characteristics, most of 2C training institutions develop STEAM education courses by themselves without purchasing products from 2B institutions.

Market entry: The largest customer group of 2B institutions is from public schools, which are capable of purchasing expensive STEAM courses and equipment due to their sufficient capital. Opening biding, however, is usually required, and competition with semi-governmental agencies like Shanghai STEM Cloud is tense, forming high barriers of markets entry. Compared with 2B institutions, 2C training institutions have easier access to markets because they only need to obtain related business licenses.
Expansion speed: The expansion speed of 2B institutions is limited by high barriers to entry into and dispersion of public schools. Besides, 2B institutions cannot expand on a large scale by duplicating one business mode within a short time because of the requirement to provide customized products for different schools. 2C institutions are immune to the aforementioned influences and can carry out nationwide expansion by duplicating one business mode based on their need for business development as long as one branch is established successfully.

Robot and IoT STEAM education holds the most tremendous potential in the social market
STEAM education products include five categories: robots, STEAM toys, IoT, 3D printers, and drones. There are over 1,000 robot-based educational institutions in Chinese market, which can be categorized as imported series and domestic series. The imported series are of larger quantities, represented by LEGO from Denmark; and UBTECH and Partner outstand among domestic series. IoT products are mostly provided by domestic corporations. It is an emerging field, which is expected to see high potential market demand and close cooperation with public schools in the future. Therefore, IoT products will be promoted at a high speed.

3.3 STEAM education needs to break shackles for popularity
Five risks hinder the popularity of STEAM education
STEAM education is at an exploring stage where further improvement in certain fields are needed in order to boost stable and long-term development. These fields include: policy support, teaching improvement, capital assistance, concepts of parents, and increasingly fierce competition.

Policy support: Although STEAM education has been mentioned in government policies repeatedly, currently it still lacks systematic planning and detailed implementation plans. If comprehensive interpretation and localization cannot be guaranteed at a top design level, educators in China may go stray gradually.

Teaching improvement: The cross-subject feature of STEAM education requires high innovative abilities of teachers. Teachers with traditional education trainings need to improve their skills to adapt to the entirely new teaching requirements. In addition, the shortage of STEAM courses that can be replicated and reused is also an important problem for educational institutions to solve.

Capital assistance: The advancement of STEAM education requires significant financial investment. Public schools in under-developed areas cannot meet the growing demand for STEAM education due to their extreme dependency on governmental financial support. Private schools in the third- and fourth-tier cities also face the same financial problems because of cost pressure.
Concepts of parents: The main reason causing parents’ disapproval of STEAM education is the lack of evaluation standards and assessment means. Compared with exam-oriented education, STEAM education cannot prove students’ progress in an identifiable manner, and is likely to generate unsatisfying results. However, some parents still expect their children to gain advantages in the exam-oriented education through STEAM matches. For example, some parents encourage students to add extra credits to the results of College Entrance Examination through winning awards in robot contests.

Increasingly fierce competition due to the entry of overseas educational institutions: Chinese parents’ willingness to invest in education tops the list globally. With the permission of Chinese government, STEAM education embraces rapid popularity. In addition, overseas excellent educational institutions such as Pearson and LEGO are making passionate entries into the Chinese market. As a result, competition within the industry are growing fiercer and fiercer.
Trend four: "Going global" trend is continuing to heat up

4.1 Domestic education export focuses on vocational education and higher education
Currently, Chinese education export is at the initial stage. After the promulgation of The Plan to Boost Educational Cooperation with Countries along the Belt and Road by Ministry of Education in July 2016, the existing spontaneous education export is developing smoother, and new education export programs are in an active preparation. With the support and encouragement of policies, Chinese education export is expanding and thriving. Driven by future national policies, enterprise capital, and researches and communications of schools, as well as domestic education system innovation, China’s education industry will take off in the favourable environment generated by the Belt and Road, based on the construction of internet platforms and the enhancement of science and technology strength, facilitating overseas layout, improving commercialization of education export, paying more attention on soft power export, and covering every educational level.

In terms of subjects, enterprises and schools play the leading role in China’s education export. For enterprises, overseas layout helps them build an international corporate image, prepare for pursuing a share in overseas market and seek new interest points. For schools, overseas layout is an effective means to better keep in line with international standards, build eminence in the international market, and create educational brands.

China’s education export intensity,

![Chart showing education export intensity by type of education subject and education stage](source: Deloitte Research)
Enterprises as the subject

Technical enterprises focus on vocational education and higher education related export mainly through software platform building and hardware export, targeting some European and American countries and most Asian and African countries. Weidong Cloud Education took over DEMOS, which ranks the second largest vocational education institution in Europe, in 2016. By establishing branches in 12 countries across five continents, such as France, England, America, Germany, Switzerland, China, and Australia, etc., Weidong Cloud Education constructs a global cloud platform for vocational education, and initiates the online process of vocational education courses on the platform. In addition, its remote smart classroom programs will be implemented in six Asian and African countries, such as Cambodia, Pakistan, Sri Lanka, Egypt, Ethiopia, and Djibouti, supporting these countries with hardware technology.

As for educational enterprises, they focus on export in K12 and vocational education fields by taking over or investing in overseas online platforms or related education institutions, or directly establishing their own platforms. Chinese educational enterprises usually adopt acquisition in K12. For example, at the end of year 2015, NetDragon Websoft Inc. took over Promethean, a long-established online education company which has a global network covering 1.3 million classes in over 100 countries, to promote its intelligent educational products globally. While in vocational education, Chinese educational enterprises mainly apply platform and course export. For example, XSTECH, which focuses on vocational training, established its own vocational training platforms in Thailand and South Africa in 2016 in response to the demand for skilled talents in Southeast Asian and African markets, and offered courses like graphic design, video design, and Mandarin.

Schools as the subject

Chinese schools are very reluctant to export early childhood, preschool and K12 education. The lack of mature school running experiences and creative educational systems result in difficulties in export. In addition, as it is still learning from relevant educational modes from European and American countries and making integration and creation efforts, China lacks competitive educational products in these fields.

The overseas layout of public schools, however, have begun to take shape in higher education field. Currently, Chinese universities are improving internationalization and accelerating export in two aspects. The first one is to recruit more overseas students, and the second one is to establish overseas schools and boost cooperation in school running and projects. In 2016, the total size of foreign students studying in China exceeded 400,000, with a year-on-year growth of 11.35% compared with 2015. Among them, African students hit a year-on-year growth of 23.7%, and Asian students 10.34%, indicating a rapid increase of the number of foreign students. What’s more, by the end of March 2016, there were five overseas universities and 98 schooling projects by 35 Chinese universities in 14 countries and regions. In a summary, higher education export is increasingly enhanced and the driving force from the government and universities cannot be underestimated.

In vocational education field, Chinese public and private vocational colleges are intensifying their efforts in export. From the perspective of policies, local governments actively encourage vocational colleges to seek for international cooperation, and establish overseas branches or carry out cooperative projects with overseas enterprises. From the perspective of enterprises, due to cross-border trades with China, enterprises in Southeast Asian countries require comprehensive talents mastering languages of both countries and professional skills. As a result, domestic vocational schools actively export vocational education to meet such needs. As for schools, they cooperate with enterprises to combine production with teaching by establishing overseas branches in Southeast Asian countries and sending local employees to local Chinese transnational enterprises, with whom they cooperate, for learning and practicing. These measures have resulted in better educational modes of schools and higher professional qualities of overseas students.

Ministry of Education: “Statistics of Foreign Students Studying in China in 2016”

Ministry of Education: “China’s Actions in Education Cooperation under the Belt and Road Initiative”
4.2 Education digitalization makes a new breakthrough

The current Chinese education export can be divided into five categories by export subject and nature of educational products exported: independent establishment of overseas schools, Sino-foreign cooperation in school running, educational resources export, investment in and acquisition of overseas institutions and educational digitalization. Among them, as the main part of educational digitalization, establishing online educational platforms is making great contribution to China’s educational digitalization export.

Among the foresaid five modes, investment in and acquisition of overseas institutions, independent establishment of overseas schools, and Sino-foreign cooperation in school running have been implemented long ago, attributed to the rapid increase of Chinese enterprises’ capital strength. They are the long-existing export modes that have no significant international influence.

With the enhancement of technical strength of domestic enterprises, capital expansion and the improvement of education export willingness, the export of soft educational resources and educational digitalization has increasingly significant influence in the international market as an emerging mode. The export of educational resources focuses on soft strength export and has more profound influence. Educational digitalization export which concentrates on hard strength export supplemented by soft strength export, is identified as the mode that operates most smoothly and has expanded influence.
China’s education export modes,

**Investment in and acquisition of overseas institutions**
Recent years see more Chinese investment in overseas educational industry due to the growing abundant capital of China. Most of the investments and acquisitions are realized via capital export, and efforts have been made to integrate “soft strength” which characterizes Chinese culture and education, into local educational systems.

- **Domestic enterprises are taking active measures to enter the international market in the fields of K12 education and online educational platforms.** For example, Jiayi Education has registered a wholly-owned subsidiary and invested in the biggest online educational platform in the UK to promote its international strategic vision, illustrating the efforts of domestic enterprises to enter the overseas market of educational platforms. In addition, Confucius International Education Group has taken over Riddlesworth Hall, which is the alma mater of Princess Diana, retained its original operation team, and added “Six Arts” of Confucius to its courses. In this way, the Group tries to export Chinese culture to English education. This also marks a try of Chinese education in overseas layout.

- **Domestic enterprises are actively expanding their higher education network in the international market.** Weidong Demos Educational Group marches into the international higher education market by taking over ESC Bretagne Brest, and enhances cooperation with well-known Chinese universities (such as Fudan University and Beijing Foreign Studies University) to strengthen disciplines construction for both parties.
Independent establishment of overseas schools

Independent establishment of overseas schools is an education export mode, by which some domestic institutions establish and operate schools independently, assign teaching staff to these schools, and recruit both overseas and domestic students. All these measures make up the overall organization of schools. Combining tangible assets and intangible knowledge products, this education export mode integrates both hard and soft strength. Currently, higher education and vocational education adopt this mode mainly. However, because of high cost which basically demands independent funding of universities, difficulties in negotiation with foreign governments, and time-consuming construction, this mode develops slowly.

- Currently, the nonprofit property in higher education slows the development of most overseas school running of universities. The capital resources for the independent establishment of overseas schools are mainly social donation and state appropriation, which suggests basically independent funding from China. As nonprofit organizations, overseas branches of universities usually maintain their daily operation depending on state funding in a short term. By 2016, there are only four overseas institutions established independently by Chinese universities14, showing a slow progress of establishment of such institutions.

- Professional skills training and language skills training are two characteristics of vocational education export. Usually, vocational education institutions establish overseas branches based on multi-party investment and collaboration, namely vocational education institutions respond to policies of the government and cooperate with enterprises to carry out such programs. For example, Ningbo Polytechnic established Benin CERCO in 2016, initiated overseas school running for polytechnic colleges in Zhejiang. In the same year, Jinhua Polytechnic established International Education Center in Shinawatra University to provide skills training and cross-culture training for Thailand staff of Chinese enterprises that develop overseas businesses (e.g. Huafu Top Dyed Melange Yarn co., Ltd and Sifang Group). In 2016, the Belt and Road Alliance for Industry and Education Collaboration was set up jointly by 18 Chinese higher vocational colleges in provinces and cities along the Belt and Road, 10 domestic benchmarking enterprises and industry association representatives, and 21 countries along the Belt and Road, in order to drive Chinese vocational education and enterprises to go global. A bright future for Chinese higher vocational colleges to establish overseas schools is expected under the promotion of policies and the Belt and Road Alliance for Industry and Education Collaboration.

- Sino-foreign cooperative school running Currently, sino-foreign cooperative school running and education export are mainly participated by higher education institutes, vocational education organizations and Confucius Institute. Sino-foreign cooperative school running can be divided into three categories: sino-foreign school construction cooperation, sino-foreign program cooperation, and sino-foreign curriculum system cooperation. Moreover, China mainly exports “soft-strength” for such exports are more characteristic and have longer-lasting impact.

Sino-foreign cooperative school running between higher education institutes is prosperous, but mainly focusing on school construction and education programs, not including curriculum system. For example, when establishing the school of business of Yunnan University of Finance and Economics in Bangkok, Rangsit University prepares special facilities for it. Through cooperation with foreign universities, Chinese universities can provide education abroad more smoothly. Moreover, the export of Chinese higher education has been accelerated after signing of the agreement on mutual credit and degree recognition. Chinese universities participate in education program cooperation by recruiting overseas students and provide them with Chinese education by way of “individual culture radiation”. In 2015, overseas students accounted for 3.7% on average in major Chinese universities, much lower than the level of 20% to 30% in western countries. However, with greater policy support in the future, for example, China Scholarship Council will increase scholarships for overseas students and international education investments, Chinese universities will attract more overseas students.

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14 Ministry of Education: “China’s Actions in Education Cooperation under the Belt and Road Initiative”
Moving Toward New Heights

- For vocational education, sino-foreign cooperative school running is promising and will thrive in the short run. At present, Chinese vocational organizations have launched deep and extensive cooperation in terms of school construction, educational program and curriculum system. Regarding cooperative school construction, Liuzhou Rail Vocational Technical College has jointly established a training center in Indonesia with SGMW. By targeting the market of ASEAN, integrated recruitment of students and employees can allow Indonesians to learn Chinese and skills and assist multi-national enterprises to expand to overseas markets. As for program cooperation, Nanning College for Vocational Technology has rolled out a talent cultivation mode of “cross-border cooperation between enterprises and universities” and established nine international training bases such as the Application and Innovation Center of Industrial Robots with ABB group. In terms of curriculum system cooperation, the vocational education system of “industry-university and university-enterprise cooperation” applied by Chinese vocational colleges and enterprises is also very popular in Africa and Southeast Asia. It attracts overseas students to China to promote China’s vocational education mode.

- Confucius Institute is a major channel of Chinese cultural export. China provides Chinese education and Chinese cultural education through Confucius Institute or Confucius Classroom affiliated to overseas universities. As of 31 December 2016, 512 Confucius Institutes and 1,073 Confucius Classrooms have been established in 140 countries. Europe (170) and America (161) have the most Confucius Institutes and 8 countries in America own the most Confucius Classrooms (554). Meanwhile, for countries participating in the OBOR Initiative, the number of Confucius Institutes and Confucius Classrooms have exceeded 100. Hanban is responsible for promoting Confucius Institute on behalf of the Chinese government.

- Second, overseas publication of tutorial books (hasn’t become fixed business mode). Thanks to the trend of education exchanges between Chinese and British primary education sectors, East China Normal University Press entered an agreement with Harper Collins Publishers, a famous UK press, to publish “British version” of YikeYilian (mathematics) in series in 2015. It made rearrangements in line with British curriculum standards, but kept original layout and knowledge points. This is an important attempt for Chinese tutorial industry to enter into international education market. Moreover, China exports a wide range of Chinese learning textbooks. For example, the Chinese textbooks published by Beijing Language and Culture University Press have been used by over 2,000 foreign universities and over 1,000 elementary and secondary schools. However, as existing Chinese learning textbooks are mainly designed for children not adults, Chinese enterprises may tap opportunities in this segment.

- Third, curriculum system export. Jiayi Education and Essex Education Services, UK agree to organize mutual visits for principals, teachers and students and further promote the exchange of mathematical culture for teenagers of both sides; Jiayi Education provides independently developed Flash teaching courseware for pupils in Essex to make their classes more interesting and effective. By exporting curriculum system, Jiayi Education is trying to build a world-renowned brand in mathematics education and export its mathematical curriculum system to more overseas schools.

- Soft education resource export. Education resource export, as the most flexible and convenient way to export education, has entered into overseas markets long time ago. As a way of exporting soft strength, it is of great significance. Soft education resources to be exported include teachers, educational publications and curriculum systems.

  - First, overseas teaching. It is very common to send teachers to teach overseas in China’s vocational education and language education sectors. Nanning College for Vocational Technology, for example, has sent teachers to teach technicians, students and teachers in some ASEAN countries such as Vietnam and Thailand to promote sino-foreign exchanges. In terms of language education, Confucius Institute recruits large amount of teachers to teach Chinese across the whole world.

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**Education digitalization construction**

China now mainly provides instructional instruments and relevant technology support for other countries to help build digital education facilities via education infrastructure exports. China proposes education assistance plans to support the education development of countries participating in the OBOR Initiative through "South-South Cooperation" programs and conduct education cooperation with a wide range of areas of the world. Chinese enterprises help other countries construct digital and intelligent education infrastructure by utilizing their advanced technology advantages. With wide presence and high acceptance in overseas markets, such collaborations can be widely accepted and smoothly implemented. Therefore, as an export way of China's education industry, education infrastructure construction is the simplest mode to be promoted. Meanwhile, with the investments of large multinational enterprises such as Huawei (having built partnerships with over 222 universities and colleges across the world to offer technology and network platform support) and Haier Group (customizing various smart and integrated education solutions for global clients), education infrastructure has been steadily advanced in many overseas markets, so it has profound influence and bright future.

In addition, online education has been put forward at early internet era, but has been adopted and exported to overseas markets by domestic enterprises until recently. Domestic technology enterprises now are improving platform structure and content quality to satisfy the needs of overseas education markets and expand influence. And meanwhile, since huge growth opportunities exist in the education markets of Asian and African countries, online education export of domestic enterprises will have great potential. Besides, domestic enterprises will constantly deepen and widen their influence in exporting online education platforms. Chinese online education enterprises now have expanded their businesses into the areas of vocational education and preschool education, and are making international investments based on abundant experience and strong business operation capabilities.

- **For vocational education, Chinese enterprises invest in online vocational education platforms in overseas markets.** For instance, China Hi-Tech joins hands with Peking University Pearson and a Korean company, Lumsol to develop online Chinese education in Korea, considering Korea’s great demand of Chinese-speaking talents. Besides, Vipabc, an adult English training platform, also builds overseas online platforms by providing customized English training courses for users in Japanese market. And, Weidong Cloud Education deepens cooperation with United Nations Educational, Scientific and Cultural Organization to provide online vocational education in five Central Asian countries.

- **For preschool education, due to weak awareness of paid internet content, domestic online education enterprises switch their focus to overseas markets.** A domestic mobile early childhood education application, Babybus, has won tens of millions of independent global users by exploring overseas markets, which have contributed most incomes and are on the rise. Babybus has formed unique advantages by exploring the underdeveloped markets of early childhood education and preschool education. It has become an industry leader domestically and globally in building online early childhood education platforms.

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35 Data from the official website of Confucius Institute Headquarters (Hanban)
36 Data from the Ministry of Education
37 Data from Huawei Authorized Information and Network Academy - HAINA
Trend five: Educational real estate develops toward diversification

5.1 Education + Real estate is irresistible

The imbalance between supply and demand has always existed in education and real estate areas. Limitations on school selection have led to decentralization of education resources and shortage of excellent education resources and two-child policy has increased household size and housing demands, it is very difficult for students to study in elite schools. The mode of “real estate + education” provides families with the best resource portfolio, avoids frequently movements for getting quality education, and brings real estate enterprises with new profit growth opportunities.

Supply side – improve added value with education, reduce housing inventory by developing educational real estate

Over the past decade, as newly developed areas can’t be sold out every year, housing inventory increases year by year. At present, China’s real estate inventory has reached the scale of RMB200 trillion, thus real estate enterprise have to take destocking actions. Besides, real estate enterprises have seen declines year by year in the operating margin of traditional house sales since 2010. The profitability of real estate industry has been obviously reduced, real estate enterprises are in urgent need of new profit growth points. Therefore, many real estate enterprises have invested into education industry in recent years. As rigid social demands, education resources have always been the concern of many Chinese families, under such circumstance, by integrating education resources with real estate resources, educational real estate thrives. Since 2011, the size of educational real estate market grows year by year and newly added educational investment programs also expand in amount and size every year. Educational real estate is growing as a new profit growth point of real estate industry and the cooperation in educational real estate sector has also become more and more complicated and mature.

Demand side – families’ demands for real estate and education resources grow steadily

With the growing up of a new generation of parents and the implementation of two-child policy, many parents are willing to buy more houses for obtaining quality education resources. Currently, key elementary schools in many cities have tightened up recruitment policies and set stricter limitations on students’ hukou. Thus a boom of purchasing school district houses was arised, driving the demands of educational real estate to a higher level.

The value of educational real estate is reflected in three aspects: firstly, buyers having children with education needs, are very likely to buy houses for good education resources; then, school district houses or houses with quality educational resources are sought-after in second-hand housing market, inventory housing market, and house leasing market; and backed by rigid education demands and stable client base, educational real estate is resilient and stable enough to withstand market fluctuations.
5.2 Three major modes of educational real estate

Educational real estate is an industry combining and operating land resources and education resources. In terms of operating body and combination mode, it can be divided into three modes: sponsorship and affiliation, cooperative school running and independent school running. Different participants have different roles to play, which means that the amount of investments, investment turnover time, return on investments, management responsibilities and financial risk incomes may vary for different real estate enterprises.

Three major modes of educational real estate:

1. Sponsorship and affiliation
   - Details: Developers sign agreements with elite schools to build schools, and property owners can have access to elite schools and tuition fee discounts. School or the government has the right to use the completed project.
   - Representative enterprises: Longfor Properties, China Resource Land, China Jinmao Group.
   - Programs: Downing ONE, Xidihongshan, Jinmao Place etc.
   - Risk and return: Low risk - low return

2. Cooperative school running
   - Details: Real estate enterprises spend money on school construction, facility purchase, equipment maintenance, and property management. Schools spend money on daily teaching management.
   - Representative enterprises: ZTSS, Wanda Group, Poly Real Estate, Rongqiao etc.
   - Programs: RYB Kindergarten, Kindergarten of Chinese Academy of Sciences, Guiyang Weiming Experimental School, Qingdao Experimental School, Fuzhou Rongqiao Elementary School etc.
   - Risk and return: Middle risk - middle return

3. Independent school
   - Details: Developers establish education brands, run schools, and recruit teachers or teaching faculties. Mainly are international or bilingual schools, real estate enterprises are responsible for students recruitment and teaching service management.
   - Representative enterprises: Country Garden, Vanke, Yangguangcheng etc.
   - Programs: Guangdong Country Garden School, Vanke Private School, Yangguang International School etc.
   - Risk and return: High risk - high return

Source: Deloitte Research
5.2.1 Real estate enterprises seek affiliation to elite schools via sponsorship, elite schools are highly sought-after

Early educational real estate was only a marketing method of real estate enterprises for attracting customers. Real estate enterprises develop and construct commercial residential buildings nearby schools (some seek affiliation to nearby elite schools via sponsorship) and commit owners exam-free enrollment opportunities and discounts according to the enrollment policies of local education authorities. This mode of educational real estate advertising with the banner of "education" requires low investments, features with fast capital circulation, and can obtain the premiums brought by education resources. Taking CR Land's Xidihongshan Program as an example, it adopts an integrated basic educational mode by introducing "kindergartens, Beijing Primary School, and Beijing No.14 Middle School". Property owners, with or without local Hukou, can send their children to these schools without paying any sponsorship fees. Besides, it neighbors upon many higher education institutes including Capital Normal University, Central Conservatory of Music, and Capital Medical University etc. With regard to cost investments, CR designed and constructed schools at the early stage, then delivered the using right to Xuanwu District Commission of Urban-rural Development and Beijing Primary School upon completion, and later provided hardware facilities with schools and paid some sponsorship fees for property owners. However, this mode has not been very successful yet as increasing defects have been detected. Firstly, as real estate enterprises and schools don't have any business or cooperation relationships, contract disputes may be arised as schools have to recruit students in line with local government's policies and developers can't fulfill what they have promised at the early stage; secondly, due to the eager for quick success, developers ignore the quality of students and ruin the brands of "elite schools". The reality that not all resources of elite schools are quality resources is making the attraction of elite schools as a stunt.

5.2.2 Cooperative school running mode of "real estate + elite school"

Cooperative school running is popular and mature, which refers to a mode that real estate enterprises invest in building schools, purchasing facilities, and maintaining facilities, and schools recruit teachers and introduce professional courses and teams, manage daily teaching, and provide management and operating services. Private schools usually adopt such mode. Moreover, some real estate enterprises collaborate with local educational authorities by delivering completed projects to local educational authorities. This operating mode features with higher joint operating costs with educational groups, longer period of investment returns and greater risks. But it can create spillover effect on education resources for real estate enterprises and increase the development value of surrounding land. Taking ZTSS's transformation as an example, the company mainly engaged in traditional infrastructure and bridge construction businesses now invests in establishing international schools. One of its subsidiary, Wenkaixing Educational Investment Company and Tsinghua University High School have agreed to establish a K12 international school providing education from primary school to senior high school. After completion, this international school operates independently and recruits students independently. After investing RMB1,481 million into infrastructure and teaching facilities, Wenkaixing rents it out and provides property management and other professional services. Its makes profits from rents, property management fees and other service fees. Excluding operating costs, the annual net profits are expected to reach RMB350 million after the school year of 2012-2022. The cooperative school running mode of "real estate + elite school" drives balanced allocation of quality education resources. In order to attract clients, teaching management teams of elite schools have contributed to the reallocation of teachers in different regions by establishing branch schools in second and third tire cities. Industrialized education opens new markets and "real estate + education" acquires new vitality.
5.2.3 Real estate enterprises establish education brands by themselves

Some real estate enterprises choose to establish educational groups by themselves to further upgrade real estate development. Key factors for the success of such mode include excellent president, qualified teaching staff, and scientific development scheme. This mode brings with the biggest development difficulty as well as the biggest economic benefits. To ensure the stability of education, real estate enterprises have to act as school builders and operators. But the advanced mode of educational real estate gives them the right of operation and management and turns educational incomes as operating incomes (education becomes an operating item of real estate enterprises).

The rapid growth of Country Garden Education in just a few years shall owe to the mature and completed “Country Garden Mode”, which highly integrates real estate with education. Firstly, Country Garden adopts the same operation and management mode in schools and other internal departments, implements uniformed management to all schools, uses the same name, builds a self-owned brand, and identifies school running objectives and missions; secondly, although Country Garden can’t avoid heavy-asset expansion in establishing schools, it creates synergy effect with relevant parties by utilizing internal resources and achieves “fast turnover” by using its low cost advantage in purchasing land; and thirdly, as Country Garden targets middle and high income families, it mainly operates high-end international schools with higher tuition fees than the average level, emphasizes high-quality education, and has won the trust of property owners for fine hardware facilities, outstanding performance and enrollment rate, and excellent teachers.

5.2.4 Educational complex rises

In recent years, the integration of educational real estate has upgraded from providing simple community education services to providing allaround education services. A new operating mode of educational real estate – “education complex” has emerged in some cities.
Now leading education companies and real estate tycoons are trying to develop education complex. Education complex is an education service center operated under a coupling pattern, featuring with diversified education brands, uniformed management and space and resource sharing. It upgrades industry format from education to education ecosystem by providing education derivatives and derivative education services. The “compex” refers to two aspects: one, one-stop education service, namely, by attracting educational training organizations to aggregate various brands and achieve scale operation. One-stop education effectively consolidates scattered education resources such as consolidating traditional school education with culture, art, and other non-academic education resources to form regional education ecosystems with integrated educational, cultural and art services. Two, full industry chain, namely, satisfying customers’ demands for education resources and other resources at the same time. For example, building educational, catering or entertainment complexes to satisfy parents’ shopping needs when they are waiting to pick up their children.

Future development directions for education complex:

- Services and products will cover the whole industry chain in the future: education derivatives based on education courses including school supplies, accessories, derivative education services (including dining area and lounge area), and derivative education consumption (including family consumption, clothing, entertainment, photography, swimming pool and other recreation facilities).

- Education businesses will serve all age groups in the future. Based on basic education training for adolescents and quality-oriented education, education complexes in the future will try to cover various age groups, for example, interest courses including yoga, cooking and painting for office workers, applied courses such as language and finance, and family experience courses including parenting courses for parents.

- Cooperation, instead of competition, with real estate enterprises. Large education organizations will jointly found management companies with real estate enterprises to achieve resource circulation and sharing by encouraging them to provide property management services. Besides, such collaboration can also help share risks and benefits.

- Innovative breakthrough of business operation. Future education complex will transform old business thinking focused on “training” or “rents” to an all-around mode covering financing, land purchase, investment attraction, customer flow, registration, teaching, service to management.
Trend six: Technology redefines education

Future education industry will constantly be disrupted by new technology. The emergency of artificial intelligence will bring education industry with four trends: intelligentization, flatization, digitalization, and three-dimension. These four trends reflected in users’ learning process at different education stages, will restructure the relationship of different parties in learning process, improve the efficiency and scale of education, make quality education resources more accessible, and redefine China’s education industry.

6.1 Intelligentization
The core of intelligentization trend lies in artificial intelligence. Artificial intelligence is a technology that can process data intelligently based on big data collection and multi-dimensional recognition system and exchange information with human beings through interactive interface and application scenario. The essence of this technology is accepting user data and making analysis and feedbacks. Therefore, artificial intelligence can be applied in practical education scenarios to integrate with five part of learning process: teaching, learning, practising, assessing and testing, analyse questions with image and voice recognition functions, and provide personalized solutions and effective feedbacks for users via deep data learning, self-adaption and computing.

Four innovation directions of education technology:

Source: Deloitte Research
Application of artificial intelligence in five learning processes:

- **Collect preference data in advance and add feedback process**
- **Analyze original data and feedback data to make teaching system more scientific**

- **Make in-depth analysis over learner’s learning mode**
- **Provide targeted advice on adjusting learning mode based on scientific mythology**

- **Recognize testing results submitted by learner by using recognition technology**
- **Perform deep learning and assess results based on preset standards**

- **Collect learner’s behavior data and make prediction**
- **Develop learning plan based on testing data**

- **Design algorithm by using big data to analyze learner’s behavior**
- **Strengthen targeted weaknesses in dealing with personalized question portfolios**

**Technical difficulty**

**Teaching**
- **Self-adaptive curriculum system**, learning management system (LMS), AI teaching assistant, robot for children education, and scientific education robot for corporate use

**Learning**
- **Self-adaptive curriculum system**, Hierarchical reading system, learning management system (LMS), open data, and scientific education robot for corporate use

**Assessing**
- **Self-adaptive question bank system**, Hierarchical reading system, Self-adaptive curriculum system, AI teaching assistant, AI customer service, scientific education robot for corporate use

**Testing**
- **Self-adaptive question bank system**, open data, scientific education robot for corporate use

**Practicing**
- **Self-adaptive question bank system**, open data, learning management system (LMS)

Components of intelligent educational technology market:

According to the characteristics of deep learning, intelligent recognition technology and the integration function of big data, education industry can be classified as four intelligent modes: self-adaptive learning, online assistant, informatization management, and intelligent robot.
Artificial intelligence + self-adaptive learning mode
Currently, self-adaptive learning has been applied in three product patterns: self-adaptive question bank system, self-adaptive curriculum system, and hierarchical reading system.

Firstly, as a primary service pattern for many internet education businesses, self-adaptive question bank system, focuses on “testing and practicing” and has the lowest entry requirements and technical barriers. Question banks of entry-level can allow learners to search exercises and answers. After upgrade, question banks add new functions such as online practice and exam. Now several enterprises engaged in developing question banks have introduced artificial intelligence to provide practices of proper difficulty for learners according to their capabilities and then gradually increase difficulty so as to improve knowledge. For example, Yiqizuoye Corporation has introduced self-adaptive learning tools from a US company, Knewton, to offer students more personalized practice arrangements by utilizing personalized student behaviour data collected over a long period.

Secondly, self-adaptive curriculum system covers “teaching and learning” parts and arranges curriculum for students in different situations, and reforms traditional curriculum arrangement mode by teachers with artificial intelligence. The part of practicing can be easily reformed by using big data to collect test questions, while it would be very difficult to reform the part of teaching. Since great difference exists in learner’s learning progress and learning capability and teacher’s teaching method and teaching level, the processes of traditional learning and teaching are generally delivered face to face. However, with the help of artificial intelligence, self-adaptive curriculum system can turn important and difficult teaching points such major knowledge points and important learning approaches as a highly-efficient and standardized system curriculum by using big data and algorithm to help learners at different level to better understand different courses. Self-adaptive curriculum system has made significant breakthroughs in language learning area.

Thirdly, as a self-adaptive learning system aimed to learners’ reading capabilities, hierarchical reading system has been widely used in English reading area and is making breakthroughs in Chinese reading area with the support of AI technologies. Hierarchical reading system developed based on AI technologies can provide corresponding tests by analysing learners’ reading content and recommend appropriate reading materials for them automatically to relieve parents from the dilemma of choosing reading materials. Although Chinese schools and families have great demands for hierarchical reading products, the development of Chinese hierarchical reading is far from mature. At present, there are two main development paths: the introduction of foreign solutions prevails in English hierarchical reading area; and domestic enterprises are the main force in developing Chinese hierarchical reading area.

Artificial intelligence + learning information management system
Now, the mode of intelligent learning management system based on artificial intelligence has two kinds of supports: open data and learning management system (LMS).

Firstly, educational technology enterprises can help enterprises and schools improve teaching plans and teaching quality by opening big data and making analysis and feedbacks based on artificial intelligence. With big data and artificial intelligence, enterprises can provide technical support for offline education entities by using their own technology strength and data storage. Currently, education enterprises and IT companies mainly provide open data for vocational education and K12 education sectors.
Then, by integrating artificial intelligence with LMS, cloud computing and deep learning function can help enterprises achieve automatic homework, test and course arrangement as well as scientific assessment. This technology has been introduced by some schools and education enterprises to track learning progress, collect learning data, assess capability, manage learning situation, and connect parents with schools. Integrating with open big data, this mode challenges traditional teaching system, makes teaching more targeted, quantifies and visualizes the learning situation data of students, and improves teaching and learning quality. The application of LMS in K12 education sector is limited because of inadequate terminal user coverage. But, it has great application potential in Chinese universities for adequate coverage of mobile terminals and serious absence of communication between teachers and students. In the future, this mode may deepen the integration with artificial intelligence to reshape a teaching interaction mode for universities, teachers, and students.

**Artificial intelligence + online assistant**

For traditional teaching, teachers and teaching assistants are responsible for answering questions, arranging teaching progress, and assessing students’ capabilities, etc. Artificial intelligence also can understand learners’ questions with the help of semantic recognition and voice recognition functions, understand the meaning of students’ languages and behaviours through deep learning, and make intelligent communications with students by imitating human being’s behaviours. The mode of “artificial intelligence + online assistant” can analyse learners’ learning, practicing, and testing situations in real time, assess learners, and provide feedbacks, replacing the functions of teachers to a large extent.

Due to technology limitations, now this mode can’t totally replace human beings to communicate with learners and is only applied in some universities. For example, Georgia Institute of Technology uses artificial intelligence virtual teaching assistant in an online course to answer large amount of questions that human beings are impossible to handle. In the future, algorithm improvement based on artificial intelligence and analysis of large amount of user data and behaviours will create virtual assistants with similar behaviour mode to human beings, accelerating the pace of artificial intelligence to replace human teachers. Meanwhile, virtual teacher and virtual consultant will be created in the future. The emergence of these roles will dramatically change traditional teaching and consulting and redefine education intelligentization.

**Artificial intelligence + robot assistant**

In the future, robots, by further integrating with artificial intelligence, cross-disciplinary and cross-sector knowledge, will be able to imitate the feeling, memory, recognition, and analysis functions of human brain, establish knowledge base, imagine, judge, and decide. It would be possible to use robots to judge answers, provide personalized guidance, conduct student management, facilitate parent-school communications, and improve teaching plans.

Chinese enterprises have made many attempts in robot sector. The integration of robot with artificial intelligence may become the mainstream. Firstly, children education robots are being used in more and more application scenarios, for example, Putao Technology has developed robot computers for children and many supporting software and hardware to make children education more diversified and intelligent. Besides, increasing scientific education robots for corporate use are be used to develop personalized education solutions for enterprises. For instance, Aidam, the robot of an educational technology company, Master Learner, gets 134 scores (maximum score is 150) in the college entrance examination of 2017 within only 9 minutes and 47 seconds. If breakthroughs could be made in artificial intelligence system and language understanding, the problem solving capability of robots see further big improvements. Moreover, the application of robots in personalized learning and one-to-one tutoring could greatly reduce labour costs and enhance learning efficiency and quality.

6.2 Flatization

Flatization refers to the trend of connecting learning subjects to send learning resources to learners directly. Public class is first mode of education flatization. At the early stage, public class was achieved with the support of internet technology and video recording technology, however, due to the difference in the experience of online learning experience and offline learning, the mode of public class could not completely change users’ habits; and the second mode is “live video + mobile APP platform”. By combining live video, APPs, and the open data disclosed by internet education enterprises, enterprises can synchronize online and offline education, realize real time and interactive learning, bring fine education resources to learners, and reshape future education in the real sense.
Public class mode

Depending on early internet video technology, public class mode converts quality courses of well-known schools and famous speeches into videos and share with learners via video websites. This mode has a relatively long development history. Many well-known websites, including Coursera, MOOC, NetEase, and Xuetangx.com, etc., have gained profits by offering public classes. In China, most domestic public classes are non-profitable, highly quality, and can be provided to learners at any time and any place for free, but can’t provide personalized teaching for learners with different learning conditions. Though it still relies on traditional video recording technology, many users agree that it is capable of aggregating and providing large amount of fine education resources. Therefore, the mode of public class still have profit opportunities in the future.

Live video + mobile APP platform

The mode of live video has greater ground-breaking meaning for teachers and students. Firstly, by transplanting offline education services to online education services, it offers students in education resource-deficient areas opportunities to obtain quality education. Secondly, live broadcasting technology and online classroom technology can be used to improve learning experience and increase the interaction between teachers and students. Currently, this mode mainly focuses on two aspects: course and platform, each with its own advantages and disadvantages.

Firstly, tight supervision on course content of live video education can help improve the quality of online education resources, students’ experience, and retention. Most leading enterprises engaged in live video education now are focusing on K12 education sector. For example, Yuanfudao, by switching the operating model from B2C to B2B, has made fulltime teachers take 70% of live video courses and increased the number of users. Live video education has ushered education industry into an age of large scale production.

Secondly, the mode of mobile APP platform can help enterprises acquire differentiated technical advantages. Only small amount of live-broadcasting education platforms have mature interaction model, stable servers, and pleasant learning experience. And the biggest difference between online and offline courses are authentic course experience and teacher-student interaction. Thus for education enterprises with education resources but without technical support, it is necessary to build live-broadcasting platforms that can provide pleasant learning experience.

6.3 Digitalization

Digitalization means the application of a series of emerging technologies among the public and terminal customers. What should be clarified is, education digitalization is different from internetization. Internetization is totally driven by emerging internet enterprises, while digitalization refers to technical improvement made by internet technologies to traditional education organizations based on the collaboration of internet enterprises and traditional education organizations. Digitalization includes two scenarios: first, electronic products replace traditional teaching tools and the communication ways between parents and schools, for example, traditional teaching tools such as blackboard to be replaced by computer, tablet, interactive whiteboard, etc.; second, electronic devices change extracurricular learning materials and the way to learn them, for example, learning materials in print form will be replaced by digital devices including video, application program, website and game.

In 2016, China had nearly 230,000 schools providing compulsory education, 140 million students, and a RMB300 billion digital education market. Now some progress has been made by China in education digitalization: supported by the initiative of building “three communications and two platforms” proposed during 12th Five Year Plan period, 87% of elementary and secondary schools have gained internet access and 80% of schools have built multi-media classrooms. Government policies, including the Education Digitalization for the 13th Five Year Plan Period and the Focuses of Education Digitalization Work for 2017, will further promote the popularization of digital education infrastructure in China. Education digitalization market has the space for further growth.

Thanks to great governmental support in equipping hardware infrastructure, education digitalization has been rapidly advanced in Chinese schools. Digital classroom, as the hardware basics for developing “Internet plus education” under B2B model, integrates many innovations and inventions in education digitalization area, profoundly reforms the interaction mode of traditional offline education, and is of great help for building digital campus and fostering digital education environment. Besides, campus informatization management system would increase communication efficiency among teachers, students and parents and collect learning situation data, and would be rapidly applied to offline education entities with hardware facility support.

38 http://www.gov.cn/shuju/2017-07/10/content_5209370.htm
39 http://www.jiemodui.com/N/68837.html
Currently, digital education services are mainly provided by software and hardware suppliers. Hardware suppliers mainly focus on developing digital classrooms, represented by Seewo, Honghe, and Zonekey, etc. The key component of a digital classroom is an intelligent interactive screen for facilitating teacher-student communication. For the DMG Lab at Fudan University founded in 2017, the newly established classrooms for experiment are equipped with more than 10 digital screens to achieve digital interaction in classes. While software suppliers are mainly engaged in building campus informatization management platform, Qtone Education is a typical example. Campus informatization management platform integrates seven standardized product modules: campus communication, smart education administration, smart teaching, resource center, campus office, campus payment, and smart campus. It can create intelligent entrance based on cloud services, provide mobile APP service for every teacher and student, build intelligent IoT, and realize effective communication among teachers, students, parents, and schools.

6.4 Three dimension
Three dimension refers to the trend that educational technologies make flat knowledge vivid, three-dimensional, and sensible, namely, converting education content into visualized, sensible, and three-dimensional scenarios with the help of VR, AR, 3D printing and other technologies.

Virtual reality (VR) integrates with education by imitating real scenarios to enhance teaching effectiveness. Augmented reality (AR) imitates the state of things in the real environment by combining virtual scenarios with the real environment. Both of them will make education more sensible and knowledge more understandable. However, due to high costs in developing hardware and software, it is difficult to widely promote VR and AR in schools. Look at Huayu Education, for example, it develops open VR platform in terms of hardware, technology, and content aspects. Some VR tools for teachers have been introduced in some schools, but large scale application might take a while.

By introducing multi-disciplinary knowledge principles, 3D printing can help students use programming systems to design solutions to existing problems and finally apply them in hardware based on their existing knowledge. 3D printing is not only a hardware system, which also requires programming to reflect the coordination of software and hardware. Such products have been adopted by some schools. For example, the 3D printing integrated solution developed by Tiertime has been introduced in many schools in Beijing and Shanghai. However, the number of companies engaged in developing 3D software and hardware printing is far from enough, 3D printing technology is more frequently applied in industrial sectors. In the future, 3D printing may focus on higher vocational education sector to combine technology, R&D, and application more closely. But for K12 education, due to difficulties in integrating knowledge points and high development costs, 3D printing may face similar dilemmas as AR and VR.

Among those four trends, digitalization and flatization will basically achieve full coverage in coming 3 years for mature technology and low costs. Intelligentization, as an emerging concept, still needs some time to meet commercial standards, but according to the current situation, it may be widely applied within 5 years with capital support, especially in basic education sector. And due to unresolved technical problems, barriers of integrating teaching content, and high software and hardware costs, the trend of three dimension may come within 10 years.
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