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Application and Development of Big Data in Chinese Business Education

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Abstract. Despite the challenges facing Chinese business education amid COVID-19, there are trends and opportunities for business educational internationalization after COVID-19. The pandemic has acted as a catalyst for learning institutions in China to look for innovative solutions in a short period. In addition to this, the pandemic has grown public-private business-education partnerships. It will create a blended learning environment that can generate a better educational experience with more than 100 percent face-to-face learning. Furthermore, quality learning and teaching materials will be widely used and well-curated after the pandemic.

Keywords. Covid-19, face-to-face learning, business education

Introduction

Business education occupies a strategic position in the educational history of China. It is significant to the development of the nation as it pursues to advance the vocational skills, attitudes, and knowledge required for the development of business careers (Amoor, 2010). Additionally, business education offers managerial talents for economic reform, sector restructuring, and prosperity of a country. According to Kedia & Englis (2011), business education infiltrates the whole life of a country. It affects every person individually as well as collectively whether in sports, place of worship or at home. Business education is a practical-oriented discipline implying that learning institutions offering business education should be well equipped with appropriate appliances.

Chinese business education has been forced to reform the old instructional design due to the pressure they face from employment and globalization (Duan, 2003). This is to enhance the employability of graduates and help them adapt to the environmental changes like compliance of China into the World Trade Organization (WTO) (Zhiwen & van der Heijden, 2008). Since the launching of higher education in China (the late 1970s), there has been higher demand than the supply. Over the years, a limited number of high school leavers had an opportunity to be admitted into universities and colleges. For those who had graduated from universities and colleges were assigned jobs or easily employed. By then, getting admission to universities was deliberated as a great achievement for oneself, family, and even ancestors.

Graduates were produced in lots from colleges and universities without brooding their employability, individualistic requirements, and quality (Yadapadithaya & Anuradha, 2016). However, in 1999 as university recruitment expanded, competitive pressure from the

employment of graduates, foreign counterparts, and labor market-initiated readjustments and reforms. Therefore, the Ministry of Education in collaboration with the higher learning institutions has taken greater efforts for reform implementation to get used to the new educational environment (Guo, 2004).

Business education is among the major specialty in colleges and universities in China. The Undergraduate Specialty Catalog of Common College and University gave out by the Ministry of Education in China in 1998, indicated that business education (business administration) in the undergraduate level involves a broader range of specialty including human resource management, accounting, tourism, and hotel management, financial management, international business management, logistics management, and marketing (Guo, 2004). Therefore, several universities opt to broaden the knowledge base of their students by offering them the general curricula of business education in the first two years and allow them to choose their areas of specialization in the second two years.

Despite business education being among the major specialty, China experiences a shortage of qualified and experienced business managers including multinationals, private companies, as well as state-owned firms. Nevertheless, the economic and social reform in the past decades indicates an old-fashioned business education with minimal changes. Based on these issues, this paper explores the application and development of big data in Chinese business education. It specifically focuses on the digitized development of Chinese business education, general challenges facing Chinese business education, and the challenges amid the coronavirus pandemic. Besides this, this paper explores the trends and opportunities of business educational internationalization after COVID-19, as well as business accreditation and learning outcomes.

Big Data

Big data is a concept of combining structured and unstructured data that organizations collect for purposes of mining information, predictive modeling, machine learning, as well as applications in advanced analytics. Structured data is the numerical information that organizations manage in spreadsheets and databases while unstructured data is the unorganized information or data that does not meet the pre-determined format or model. Big data can be obtained from public comments on websites and social networks, through questionnaires, voluntarily obtained from apps and personal electronics, electronic check-ins, as well as product purchases. The collection of big data across this wide range of circumstances and situations is possible because of the existence of sensors in smart devices. Some of the sources of big data include transactional data (online transactions, credit card transactions), tracking devices (global positioning system, mobile phones tracked data), administrative data (insurance records, bank records, hospital visits, electronic medical records), opinion data (comments on social media like Twitter, Weibo, Facebook), behavioral data (online searches), and sensor data (satellite imaging).

Three main Vs can characterize big data: volume, variety, and velocity. The volume entails the large size of data in several environments, the variety entails the variation of data types kept in the systems, and the velocity entails the speed at which data is collected, processed, and generated. Doug Laney, who then worked at Meta Group Inc. as an analyst, first established the 3 main Vs. Recently, other scholars have added other Vs to describe big data including value, variability, and veracity. In as much as big data cannot be equated to any particular data volume, its deployments regularly comprise terabytes, petabytes, and exabytes of data seized over time. It can be kept in computer databases and analyzed via specific software intended to handle complex and large data sets.

Big data has been significant in several sectors globally both from developing to developed economies. Organizations utilize big data to enhance operations, offer better customer service, generate personalized marketing depending on certain customer preferences, as well as increase profitability in the long run. Businesses or organizations that use big data have a better competitive chance over others because they can make more informed decisions as long as they use the data efficiently. Moreover, using big data allows organizations to progressively become customer-centric. Real-time and historical data can be utilized to evaluate the evolving consumers' preferences. This enables organizations to update and advance their advertisement strategies as well as satisfy the needs and desires of their customers.

Having big data available in different sectors presents both problems and opportunities. For instance, big data allows organizations to better modify their efforts in marketing and production through richer and deeper analysis. As a result, they generate higher satisfaction levels as well as repeat business. On the other hand, big data can cause problems by creating noise. Organizations handling big data should determine which data denotes signals and which data generates noise. In essence, they should determine the relevant data by studying the format and nature of the data itself.

Big data in Business Education

Business education is a section of education that entails teaching operations and skills of the business industry (Azevedo, Apfelthaler & Hurst, 2012). Big data is applicable in business education through technologies such as the Internet of Things (IoT), Smart Cities, and artificial intelligence. Big data can transform business schools and business education in general through teaching, creating, and connecting.

(a) Teaching

Online education generates a lot of data that can enhance learning as well as allow improvements in personalized learning. This can allow learners to track their daily informal and formal learning activities using learning technologies. Users of the learning technologies create modified educational trails to make their data accessible to prospective employers. As a result, prospective employers gain knowledge through talent analytics. The availability of the "gamification" initiative makes it easier for software to track the daily educational activities of learners (like completing assessments, projects, and modules), award points, as well as facilitate competition.

The increasing demand for talent analytics is driving innovation both in degree and diploma programs. Business schools have evolved and launched new programs including co-branded and themed degrees, master's programs, executive education, and undergraduate majors' courses. Learning institutions are merging and reemerging disciplines differently to create distinctive curriculum merges that target precise sectors like transportation, energy, and health care (Henry & Venkatraman, 2015). Besides evolving new programs, almost all business schools have revised their main undergraduate and MBA curricula to integrate data analytics. They have been rethinking on replacing statistics and mathematics requirements, introducing essential analytics courses, as well as incorporating ideas all through the curriculum. Regardless of the recent growth in new programs, the curricula and programs in data analytics have not met the growing demands of the business. To solve this issue, AACSB began an analytics Curricula Advisory Group to fast-track the development of business curricula globally.

(b) Creating

Big data can introduce new research ways in business and management. This is because scholars can access more and better data to carry out innovative research schemes. Businesses generate raw data and information that create new research opportunities allowing the business

faculty to work together with students and practitioners to form new insights. New policies have been formed to take care of the intellectual property as well as sensitive information. Besides this, there have been new research platforms like Wharton Customer Analytics which help companies and scholars globally to come together and create a good comprehension of customer analytics. Customer analytics is likely to alter research measurements and track how research affects. Consequently, this favors utilization as well as an added value more than prestige and exclusivity.

Big data has evolved the work of academic researchers. Researchers can move freely from academic institutions to businesses and vice versa. Additionally, more scholars have co-created new knowledge with research academics involved in non-business courses and practitioners. Experts have come up with a combination of discipline or disciplines which can train learners to become scholars supporting the increasing demand for talent analytics as well as leadership in data analytics.

(c) *Connecting*

The exploration of big data in business education indicates that the practice and academia in business schools need stronger and better connections. This is because of the continuous advancements in data analytics which requires business schools to be more connected to practice. Therefore, the available partnerships have provided easy access to experiences, data, and resources, as well as talent for students, faculty, and businesses respectively. Additionally, available data analytics initiatives have facilitated more interdisciplinary and cross-sector work. Data analytics cannot only bring significant changes in businesses but also transform government in sectors like environmental sustainability and transport logistics. Also, it can help NGOs through people analytics and procurements. Business schools, through data analytics, can extend their influence across sectors, thus creating new connections. These connections include working together with athletics (like sports analytics), policy schools (like cybersecurity), mathematics, statistics, and computer science (Henry & Venkatraman, 2015).

In the energy sector, big data aids gas and oil organizations/companies to pinpoint possible drilling locations as well as monitor pipeline operations (Mohammed, Ghareeb, Al-bayaty & Aljawarneh, 2019). Similarly, utilities use big data to control electrical grids. The financial sector, particularly financial services companies utilize big data systems for real-time insights and risk management of market data (Fang & Zhang, 2016). Transportation and manufacturing firms depend on big data to accomplish the supply chains thus, achieving optimal delivery routes. Medical researchers use big data systems to identify the risk factors of a disease. Furthermore, doctors use it to diagnose health conditions and illnesses in patients. The data generated from electronic health records, the web, social media, as well as other applicable sources offer healthcare administrations and government agencies with instant information on the outbreaks or threats of infectious diseases (Murdoch & Detsky, 2013). Therefore, data analytics and big data imply more and better connections and more influential business education.

Digitized Development of Business Education in China

Business education has tremendously grown due to the increased number of learners who opt to focus on business education in higher education. In China, business schools were set up in regular learning institutions during the mid-1980s. However, in the 1990s, China experienced an economic reform that accelerated the actual business school development (China Statistical Yearbook, 2001). During this period, the theory of “establishing a modern enterprise system” had been introduced in China. Besides this, China was on the verge of

introducing a new age of “socialite market economy.” By the late-1990s, China recorded a significant increase in the number of students enrolling in business programs from 396,534 students to 554,569 students (1994 to 2001 respectively) (State Statistical Bureau, 2001). The MBA programs in China emphasize specialized courses like human resources, marketing strategy, innovation, management information systems, among others.

Unlike the United States’ MBA education which began in the late 1800s, MBA education in China began in the 1990s. The MBA program was first launched in 1991 with only 9 MBA programs in China. Over time, the programs have increased to 62 universities across 27 cities and provinces by 2013, and now almost all colleges and universities across all provinces and cities in China offer business-related programs. Enrollment figures have indicated an increase: yearly enrollment (6-7 percent increase), from hundreds of students in 1991 to 12,173 students in 2001 (State Statistical Bureau, 2001). Fortunately, both foreign and Chinese professors teach MBA programs in China. Therefore, foreign learners have an opportunity to enroll in an English or Chinese MBA program depending on the learner’s Chinese proficiency. Several companies carrying out businesses in China focus majorly on talent analytics. However, many Chinese managers have not been exposed to western management skills making the big multinationals to hire talent analytics from overseas.

Although the old educational system may be felt in one way or the other in the current educational system, Chinese business education has revealed to be a different and fashionable program for learners over the past years. This is due to the introduction of big data in the business world. Furthermore, the Chinese government’s pursued policy indicates that enterprises should be independent economic entities aiming to achieve success. Therefore, the significant change in business education has created a stern market share competition, resulting in a new and different economic system for the enterprises (Zhao, 2003).

Additionally, service quality, educational production, effectiveness, and efficiency of internal management have proved to be vital in the existence of any enterprise. Due to the changes in the economic systems, the enterprises have a confrontation with the external surrounding. Consequently, firms are supposed to handle issues like the supply of raw materials, pricing, competition, consumer demand, promotion of products, sources of capital, and sales channel. For the firms to handle these issues efficiently, experts have paid great attention to business education to gain different techniques that are essential in navigating through the new economic system in china.

The opening of China’s economy resulted in close contact between China and the world economy, bringing about the entry of China into the World Trade Organization (WTO). This implied that China had to abandon its eccentricity to generally agree with the worldwide economic rules. Noticeably, the then economically progressive economies (like the European and American) had decades of investment in industrial, commercial, institutional, and marketing operations and management. To join these countries, China had to acquaint itself with the operational and management systems that supported these economies. This made enterprises in China to turn unto learning institutions to familiarize themselves with the business world, particularly knowledge from advanced countries in the West.

Challenges of Business Education in China

Inadequate resources and Qualified Teachers

China lacks experienced and qualified manpower to facilitate business education. Although higher learning institutions have been equipped with necessary reference and teaching materials, there are limited business educators to facilitate business-related programs. This has been an existing problem since 1991. Some universities pursued professors who have

specialized in different fields like engineering to become Business educators by taking a few business-related courses. Besides this, a lot of universities allow MBA or MA graduates to teach business-related courses immediately after graduation regardless of limited or no business experience. As a result, these graduates apply a poor teaching methodology in classrooms. Usually, the teaching quality heavily depends on the educator's sense of duty and conscientiousness, and very minimal on professional qualifications. The lack of experienced educators is attributed to the lack of enough business professors (Bassey, 2006).

Generally, in China, the teacher-to-student ratio is 1:14 and worse in business-related courses (1:26). Besides this, China has a significantly less number of full professors. There are more than 1600 students for each full professor in business education. With the current scenario in China, competition between domestic enterprises and foreign ventures, the quality and quantity deficiency should be handled. China needs thorough reforms in business education to satisfy international business standards. Although there have been existing connections between foreign and Chinese higher learning institutions, there is still a lot to be done to advance business education programs.

Governmental/Teacher/Parental Factors

According to Puyate (2008), teachers' factors particularly lack experience and professionalism negatively affects business education in China. In addition to this, teachers are offered inadequate allowances, lack of motivation, as well as the non-cordial bond between students and teachers. Therefore, business educators opt to shift from the teaching profession to big firms in search of greener pastures (Olu & Beecorf, 1982). Besides this, inadequate parental cooperation, lack of government appreciation, poor government support, and the inability of guardians or parents to purchase essential course books hinder business education.

Poor Funding

Funding ensures adequate availability of learning materials. Poor or Inadequate funding leads to non-availability or limited access to learning materials which negatively impact business education (Puyate, 2008). According to Abraham & Abraham (2003), instructional or learning materials are essential in the learning and teaching of business education. Therefore, Agomuo & Enang (2018) argue that poor funding, inadequate equipment workshop, chauvinism against business education, and staffing account for the unpopularity among business education students negatively affects business education.

Inadequate Infrastructure

According to Bamisaye, Ejeh, Adelabu, & Aleje (1998), students study better when the learning environment is richly equipped with materials. The physical facilities have a significant benefit to learning and teaching. Similarly, McAliney (2009) indicated that teaching tools and methodologies, business education infrastructure, qualifications, facilities, and delivery mechanisms play an essential role in business education. The major infrastructure problem in China is class size. Scholars argue that the number of learners in a given class impacts the process and outcome of learning. Specifically, the bigger the number of students in a class, the less learning occurs, less teacher-to-student interaction, and ultimately less personalized attention.

Non-operational Libraries

The learning institutions of China lack appropriate libraries. Usually, every learning institution needs a broader range of learning materials such as stationaries, textbooks, and reference materials that are available in libraries to guarantee instructional efficiency. In China, there are limited fully equipped libraries with business education materials.

Lack of constant power supply

Electricity is essential in business education to power and energizes machines such as fax machines, photocopying machines, internet facilities, electric typewriters, and computers. Several institutions offering business-related courses are located in regions where there is limited access to the national grid. Consequently, business educators opt to only teach theory. This may not be effective as it negates the aims of business education, which are skill acquisitions. Just like any learning innovation, business education needs to exert efforts. However, several students do not want to put in more efforts into business education's manipulative skills. Similarly, some of the educators earn without professional dedication and zeal.

Poor Curriculum Content

The curriculum of business education should satisfy the trends and projections of labor markets. Unfortunately, the business education system in China has not effectively responded to the labor market changes as well as requirements of different population segments (Ran & Brooks, 2003). Several institutions appear to majorly concentrate on declining occupations whereas new and evolving occupations have not been explored. Besides this, instructional and curriculum materials are enormous such that educators do not cover every bit of them before the program ends.

Challenges of Business Education under Regular Prevention and Control of COVID-19

With the coronavirus pandemic that spread rapidly across Europe, the Middle East, the United States, and Europe, countries took decisive and swift actions to curb the development of the pandemic. The pandemic showed the significance of creating resilience to handle different threats, from extremist violence, climate insecurity, to rapid technological advancements to pandemic diseases. Most of the heavily impacted countries suspended attendance of learning institutions including China. This forced learning to move online. These changes have caused inconveniences, particularly in business education. The learning quality majorly depends on the quality and level of digital access. However, they are some individuals from low-income families who do not have access to quality digital. Therefore, online learning seems a challenge due to the cost of data plans as well as digital devices. If educational access is controlled by access to the most current technologies, then the digital divide will be extreme in China.

Due to the coronavirus pandemic, the business education departments have terminated the contracts of their staff to cut costs. These staff may include the non-academic and academic individuals on non-permanent contracts like visiting lecturers, student affairs professionals, and researchers. Besides job uncertainty, a lot of staff lacks detailed information and guidance on institutional functioning and operations during the COVID-19 pandemic. These issues have complicated the research and teaching continuity in business education.

Students pursuing business-related courses experience learning approaches that do not work well with them. For instance, business education requires practical lessons, it may be very didactic and solitary for these learners to click through presentations, watch videos, or read online documents. Besides this, business educators may be unsupported and overwhelmed to carry out their duties. This is because they had less or no notice about closing schools and moving to online learning. They have been overwhelmed with a lot of products and materials, which they are supposed to skim through and select the quality materials to use.

Several aspects of internationalization in business education have been impacted by the COVID-19 pandemic, particularly outbound, and inbound student mobility. Henceforth, study abroad programs have been affected as students who travel to study for a semester face funding

challenges and experiences. The restraining of both long-and-short-term international movements results in major repercussions for future business students. For instance, it limits the choice of higher learning institutions an individual may attend, loss of tuition revenue, and logistical difficulties (deportation or local housing of international staff and students since several countries suspended flights and closed borders during the COVID-19 pandemic).

Although China has been able to change their learning operations online quickly mainly because it has been investing in digital connectivity, innovation, and research experiences challenges which require more attention. Consequently, government expenditures may be required to alleviate the economy during the pandemic, leading to a decrease in future public allocation for business education. Students also (those receiving student loans) will feel this financial crisis. Part-time, nontraditional, lower socioeconomic, and working students may also experience financial problems that may lead to limited access and attainment of a degree.

Another challenge facing business education amid this pandemic is poor quality assurance like educational delivery. This issue has been intensified by disbelief in remote quality learning as well as insufficient alignment of online learning. If China is willing to add and adapt flexibility to their practices, the agencies of national quality assurance can play a significant role in providing support and guidance to learning institutions on issues like changing to online teaching and learning, upholding student support and academic standards, as well as alternative methods of assessment.

Trends and Opportunities of business educational internationalization after COVID-19

Although the pandemic has brought challenges, it has also demonstrated some opportunities and trends of business educational internationalization. The pandemic has acted as a catalyst for learning institutions in China to look for innovative solutions in a short period. Several online education providers like Yuanfudao, TAL online, Gensheixue, and zuoyebang reported over 20 million new users between January and February 2020 due to the pandemic (Figure 1). This indicated that online education is a ravishing trend which the providers should consider lowering the costs of consumer acquisition.

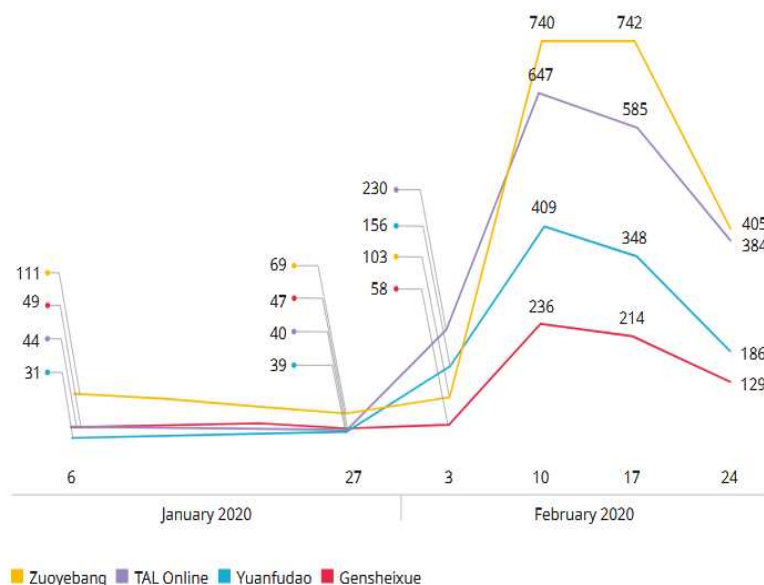


Figure 1: Online education providers in China

During the coronavirus pandemic, the online education providers offered free classes that attracted several new students, thus decreasing the consumer market cost. Figure 2 shows the significant difference in consumer market cost per head for winter 2020 and that of summer 2019. The 2020 winter customer marketing cost is less than 5 percent that of summer 2019.

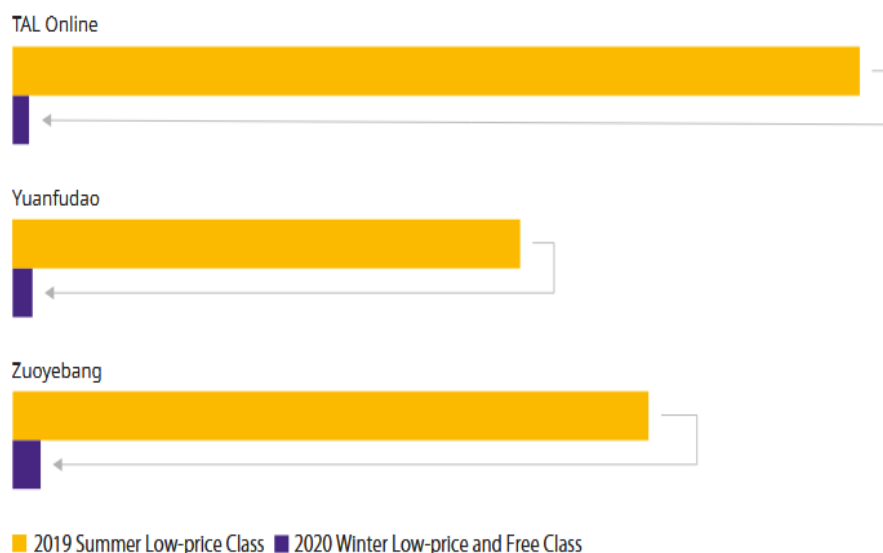


Figure 2: Consumer marketing cost for summer 2019 and winter 2020

The pandemic has grown public-private business-education partnerships. Different stakeholders such as publishers, technology providers, governments, telecom network operators, and education professionals, have come together to use digital daises as the pandemic solutions. The Ministry of Education in China has brought together various constituents to improve the cloud-based, broadcasting platforms, and online learning. Furthermore, both the Ministry of Education and Ministry of Industry and Information Technology has upgraded educational infrastructure, specifically in the business education department. Through these, the learning innovation has received more attention than the non-profit or usual government-funded projects during this pandemic period.

Previously, the private sector had greatly invested in education innovation and solutions. These private firms include but are not limited to Google and Microsoft in the United States, Alibaba, Ping An, and Tencent China, as well as Samsung in Korea. However, most of these innovations have been relatively isolated and limited in scope. Therefore, with the pandemic, they may have cross-industry, larger-scale partnerships moving towards a common business educational goal.

Also, the pandemic will create a blended learning environment that can generate a better educational experience with more than 100 percent face-to-face learning. After the business education department has done 100 percent of online learning at the end of COVID-19, then the department would consider rebalancing between online learning and face-to-face learning. The educators would heave innovated and tested some online tools and may wish to continue online teaching after all.

After COVID-19, people will be able to understand that schools are not just buildings used for learning. Generally, schools as well as educators will receive more appreciation, support, and respect for the significant role they play in society. In particular, business education saturates the entire life of China. Therefore, for this online learning to be 100 percent success, it will have taken a lot of sacrifice from business educators to support students across acquiring the required business skills. Furthermore, several students accessed critical resources at learning

institutions like clothing, mental health support, and meals which may not be available at their respective homes.

Quality learning and teaching materials will be widely used and well-curated. This will lead to a stronger collaboration of business educators. Firms have invented resource-sharing platforms for educators like Teachers Pay Teachers that allow business educators to see what other business educators have done. For instance, instead of a business educator to record a video with an instructional element required, he/she may decide to use another business educator's video which has been done well. As a result of this, business educators will be forming communities online, sharing the burden, and making things a little easier amongst themselves. Additionally, they will get an opportunity to unite and hearth connections across continents and countries, as well as share what works well business-wise in a global way.

Besides the educators' collaboration, students may find new opportunities to create online academic communities linking business students together globally, thus assisting them to attain their learning potential through collaborative international learning. This may be through forming virtual study groups, engaging in group-tutoring, and consulting mentors. Furthermore, learning institutions (business education department) should reconsider issuing scholarships to help the international students who may have experienced hardships as a result of this pandemic.

Globally, business education in several universities and colleges will be affected, especially those that mainly depended on student enrollments from China. For instance, Canada, the United States, New Zealand, and Canada will have lower China student enrollments after COVID-19. Similarly, China's business education institutions will face the same problem. Consequently, the country's economy will be affected negatively. However, learning institutions with flexible systems and infrastructure have the opportunity to swiftly respond to a huge competition of limited population of globally mobile data.

Admission and recruitments practices will be modified as individuals will be required to embrace online methods of recruitment. China's cancellation of GRE, GMAT, TOEFL, and SAT examinations during the pandemic will affect the forthcoming graduate and undergraduate enrolment for the fall semester in the United States. The course recruiters and admission deans will have to practice online recruitments to reach prospective students. Re-evaluation of the current admission and recruitment practices will be required to determine qualifying credentials and application deadlines.

Business Accreditation and Learning Outcomes

China is not considered as an emerging economy any more largely because of its superior national economy. This also explains the immense changes experienced in business education. The increasing demand for business education has caused numerous institutions to seek accreditation. The global business school accreditation body (AACSB) currently certifies over 20 learning institutions in Hong Kong, China, and Taiwan. The current number of institutions certified is ten times more than the accredited institutions in this region 20 years ago. 25 more institutions are currently being vetted in anticipation of accreditation in the future.

Concerning Bachelor's level business programs, the graduates should be able to:

- Discuss and explain the underpinning concepts associated with the practical areas of management, marketing, economics, and accounting.
- Give an accurate description of the global business environment.
- Critically analyze the social, legal, and economic situation of any business.
- Identify and expound on the ethical requirements and roles of business.
- Effectively apply tools that enhance decision making.

- Document and disseminate both oral and written communication in a professional manner.

- Integrate and utilize the knowledge acquired regarding functions and business concepts.

The basic assumption at the Master's level is that the student is knowledgeable about the core areas and functions of a business. As a result of this, Master's level graduates acquire a deeper knowledge of the concepts and areas covered in the earlier levels. Therefore, business programs at this level are expected to equip the graduate with:

- The ability to identify problems.
- Skills to integrate theory and practice for purposes of strategic analysis.
- Quantitative techniques are used in the analysis of real-life business environments.
- Effective oral and written communication skills such that they can professionally compose communications and presentations to address specific audiences.
- Teamwork skills, especially when working in a diverse workforce.
- Skills to determine and analyze the ethical requirements of a business.

Lastly, the doctoral level graduates are expected to:

- Possess effective research skills. With this, they should be able to identify relevant business research problems, utilize the existing literature, set up a suitable research study, collect relevant data, and analyze the collected data before presenting the findings.

- Show immense knowledge and ability in a core business study field.
- Come up with and share advanced oral and written communication.
- Analyze and determine a business's ethical responsibilities to foster effective management.

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Big Data Case Study – Xi'an Jiaotong University

Currently, big data management is a significant management skill in the business world. The big data analytics concept has become an essential part of Chinese business school's curriculum, like Xi'an Jiaotong University, which uniquely handles data science education. The Xi'an Jiaotong University uses big data in many ways. One of the purposes of using big data is to improve the results of students. The educational entity utilizes different assessment tools and applications to monitor the performance and activities of students. Through such real-time analysis, the tutors understand their students better and thus provide personalized learning environments. This enhances the overall performance of the students in the long run.

The institution also tailors its business courses to suit the prevailing and forecasted trends in the job market. The university offers courses related to big data. For instance, Xi'an Jiaotong University offers a course titled Bachelors in Data Science and Big Data Technology. This course prepares learners to be skillful as both data analysts and strategists. The main aim of this course is to make students understand the basic skills and knowledge of data analytics and how these skills can be applied in businesses. These skills include the general data analysis processes like places to find the right sources of data, implementation of the latest and appropriate methods and tools, as well as establishing effective results. Besides this, the course equips individuals with basic techniques such as mass data management (NoSQL and SQL data solutions), basic statistical modeling procedures, and mass data mining algorithms. Also, through this course, an individual can manage projects related to big data analysis.

Big data application and management programs are categorized into two; traditional courses as well as specified data science courses such as the technology of digital library, information visualization and analysis, and application and research of data curation. In the

information visualization and analysis course, big data concepts and technology, data service, and data management are all incorporated. On the other hand, the application and research of data curation course offer students' skills and knowledge to select and evaluate data. The course allows students to have a wide view of background data management research, history of data curation development, tools and modules of data curation, and both international and national practices. This will help students to understand the theoretical data curation knowledge as well as apply the knowledge into everyday research activities to manage research data efficiently and generate plans related to data management. Lastly, the main aim of the information visualization and analysis course is to raise the abilities of the students in data mining, visualization, and analysis with the aid of computer software such as MS Excel, R, Python, and Tableau.

The instructors at Xi'an Jiaotong University do not focus on knowledge acquisition alone. They often provide students with opportunities to gain more insight into the value of data, professions associated with data, and tasks that involve data. One of the ways through which this is attained is through interactions with guest speakers. Such speakers have diverse educational backgrounds and different levels of work experience concerning data specialization. In so doing, the learners identify meaningful links between their studies and their future careers. The tutors also promote teamwork among business education learners. Teamwork is a crucial component for data specialists, especially in the modern era which greatly relies on data. Besides this, the learners gain invaluable data analysis and visualization skills through assignments. The instructors require students to utilize specific analysis and visualization tools to manipulate and present the given data. In so doing, the learners get acquainted with such tools and how they are used by big data specialists. Lastly, students undertaking courses that are related to big data are required to complete an internship program as part of their course. The internship programs provide the learners with an opportunity to work on tasks that involve real-world data. In addition to this, they are mentored by numerous individuals within their workplaces.

Besides this, Xi'an Jiaotong University signed a major strategic agreement with SKEMA Business School that promotes the development and application of Big Data. The agreement led to the creation of a master's degree in innovation and entrepreneurship. The emphasis of this master's degree is on artificial intelligence and data management.

Two major big data network resources are used to teach this course. These resources are websites namely RyanSwanstrom and Kaggle.

RyanSwanstrom

This website is considered one of the oldest blogs dealing with data science. The blog was first published by Ryan Swanstrom in 2012. The blog is useful to data science enthusiasts and learners. Some of the useful information contained in the blog include an introduction to data science specialties, important tidbits for an aspiring data scientist, and an introduction to data science.

Kaggle

Kaggle is an online community consisting of machine learning and data scientists practitioners. The platform allows users to find and publish data sets, search for and build data models in a data-science environment, interact with other machine learning experts and data scientists, and get into competitions to solve challenges associated with data science.

With speedy developments in e-commerce, urban information, smart manufacturing, and finance, fields such as business, finance, and computer science are increasingly

interdependent. Merging methods and theories from data science, computer science, statistics, and mathematics, individuals who have studied data science and big data technology are equipped with skills to harness as well as analyze large data sets across several industries. Besides this, these individuals easily explore scientific reinterpretation and integration of system computing, interdisciplinary science, and statistical analysis. As a result, they have an all-inclusive knowledge system for the entire big data storage process, analysis, and storage. Data science and big data technology graduates tend to satisfy the wants of a broader employer's range. This is because the educational model uniquely focuses on innovation and entrepreneurship that provides graduates with abilities as well as skills to reason as an entrepreneur. Consequently, it provides a foundation for one to become a leader in future industries.

Conclusion

The significance of business education in the general public is vast and people should not compromise it. It has led to better consumer decisions as well as helps solve societal problems. Unluckily, business education is weighed down with several challenges making it inefficient. These challenges include poor funding, inadequate infrastructure, inadequate resources, non-functional libraries, as well as lack of constant power supply. Besides these challenges, Chinese business education has experienced massive changes. The increasing demand for business education has caused numerous institutions to seek accreditation.

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