Analysis on the Influences and Countermeasures of China’s Education Reform under the Background of “Internet +”

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Abstract. The vigorous development of internet technology has reengineered the traditional industries. “Internet +” brings many subversive changes for education, including the promotion of high-quality educational resources sharing, innovation of educational concepts, personalized learning, diversified education models and mobile learning. At the same time, “internet +” has a huge impact on education. We must capitalize the big data of education, strengthen technical support services, develop high-quality education APPs actively, enhance teachers’ quality and strengthen macro-control to promote China’s education reform and development from all aspects.

Introduction

In the 21st century, the vigorous development of internet technology has greatly inspired the vitality of the market. Traditional industries, especially information industries, have been influenced significantly. Media, music, animation and other industries took the lead by the devastating impact of the internet, followed by business, finance and other industries. In information age, the internet is setting off an unprecedented profound change worldwide. Traditional industries have launched the “internet +” mode. Traditional education also faced opportunities and challenges.

Premier Li Keqiang first proposed the “internet +” action plan in the government work report in March 15, 2015. This plan aims to promote the integration of mobile internet, cloud computing, big data, internet of things (IOT) and modern manufacturing, to promote the healthy development of e-commerce, industrial internet and internet finance, and to guide internet enterprises to expand the international market. The rapid development of “internet +” demonstrates that education is moving towards the era of big data. The revolutionary impact of information technology on education is gradually emerging. Education is facing a historic big change. It is significantly important for not only Chinese education but also the rise of China to seize this historic opportunity and to occupy the commanding height of education reform and development. In-depth studies have been carried out on education reform in the era of “internet +” and the significant impact of “internet +” on education. Finally, the corresponding measures on education reforms have been discussed.

Connotation of ”Internet + Education”

“Internet +”

Since Premier Li Keqiang proposed “internet +” action plan in 2015, it has become a national strategy to promote the transformational development of traditional industries. “Internet +” is to promote the transformation and upgrading of traditional industries and to nurture new industries through the combination of internet and traditional industries. The internet refers to a new generation of information technology represented by big data, cloud computing and artificial intelligence. While the “+” is representative of catalysis of internet on other industries. The essence of “internet +” is a new form of internet development, a new form of internet evolution and a spawned new form of economic and social development, driven by innovation 2.0 in the knowledge society.
“Internet + Education”

As a useful attempt in the field of education, “internet +” has brought great changes to education. It is the essence of education to be highly related to knowledge and information, and the internet is simply transfer and exchange of information. The high correlation makes the combination of internet and education logical, and internet education has been rightly seen as the highly potential market in the future [1]. Just as John Chambers, one of the internet pioneers, CEO of Cisco said, “The internet will have a huge impact on all walks of life, but in the end the biggest beneficiary will be education.”

“Internet + education” is a new form of education, essentially an effective implementation of teaching and learning activities, performed by teachers and students with the support of networks and technologies in the state of separation. Based on the essential attribute of the internet and educational consumer needs of the new generations, internet education plays its full role of optimization and integration in the allocation of production factors and creates new forms of education and ecology [2].

Models like MOOC, micro lesson and flipped classroom are all using “internet +” to shape new teaching methods and forms. In the “internet +” era, the traditional education mode: a school, a teacher and a classroom, is subsiding; a new education model: the internet, a mobile terminal and millions of students, teachers and schools free to choose, is emerging [3].

Influences of the Education Reform under the Background of "Internet +"

As the applications of cloud computing, big data, mobile internet and other internet technologies gained growing popularity in the field of education, education systems implanted by internet have occurred a series of changes, which promote the profound education reform. The new modes of human-computer interaction and artificial intelligence are changing learning methods and habits unprecedentedly, which not only brings educational technology innovations, but also leads to the profound changes in educational concept, teaching mode and talent training process.

High-Quality Educational Resources Sharing

“Internet +” reconfigures and integrates educational resources, so that high-quality educational resources are no longer confined to institutions of higher education. People in every corner of the world can have access to high-quality educational resources. In the internet era, everyone can create knowledge; everyone can share knowledge; everyone can obtain and use knowledge. Open educational resources break the wall between universities and society, and global knowledge base is rapidly forming, making educational resources greatly enriched. The feature of internet connectivity combines educational resources together through network, so that people can get learning resources in need anywhere and anytime. In addition, high efficiency and low cost of online education provide the necessary protection for building a learning community.

Innovation of Educational Concept

New forms of internet development promote the innovation and reform of educational concept, which represents a great release in people's subjectivity. Education in the internet era weighs more on people-oriented and student-oriented education. According to the characteristics of the “internet +”, people-oriented refers to that, in the new teaching mode of “internet + education”, learning experience is the core and focus, and the educated hold dominant position in the teaching activities. Education needs to redefine status of learners around the realization of human values, focusing on students' learning experience and learning needs.

In the traditional school education, teachers led the whole learning process, and the educated students, whose self-learning and individual needs have been ignored, just passively received information. Now in the background of “internet +”, the roles and relations of teachers and students have greatly changed. Through the education platform provided by internet, teachers can make use of information technology to integrate online and offline resources according to the demands of students;
students can use information technology to analyze learning situations and address problems in the process. At the same time, student-oriented educational process will not be limited to course teaching. It will be extended to post-graduate employment counseling and realization of lifelong learning.

**Personalized Learning**

In the “internet +” era, internet education is easier to adapt and meet different students' individual learning needs. It is difficult for teachers to take care of each student in the traditional class teaching system, and teaching content can hardly meet the different interests and bases of students. However, in the “internet +” era, educational institutions and teachers can collect large data of students by internet technology. Therefore they can fully grasp the characteristics, learning process and behavior of students to provide personalized products and services. Similarly, based on internet, students can select educational resources, create personalized course menus and structure learning space freely according to their own preferences and capabilities.

It becomes extremely simple to collect and record students’ learning data comprehensively and efficiently by using technical means provided by the internet. For example, MOOC platforms can help teachers to measure students’ understanding of new concepts and theories, and record students' focus length on different learning content. Currently personalized learning brought by “internet +” is mainly reflected in the adaptive learning. Adaptive learning refers to the learning method that students themselves find and solve problems in the learning environment provided by the educators [4]. At present, a number of educational institutions, such as “Youpu evaluation”, have carried out data-driven personalized and adaptive learning research and development [5].

**Diversified Education Model**

Openness of the internet determines that it does not have time or space limits. Therefore through the internet, the production and dissemination of knowledge can break the limitations of time and space, which challenges the traditional educational paradigm. Based on internet education and network-assisted teaching, diversified education models have sprung up like mushrooms: experiential learning, flipped classroom and other new education models coexist with traditional education models. One of the most characteristic patterns is the 4A (Anytime, Anywhere, Anybody, Anyway) learning model. Learners can learn from anyone, in any way, at any place, in any time. This model breaks the limitations of time and space and reconstructs traditional teaching processes and laws.

In the “internet +” era, virtual schools, such as cloud schools and mobile schools, have emerged. A virtual university provides higher education programs through electronic media, typically the internet [6]. The University of Phoenix, founded in 1976, is a typical virtual university. In addition to the 24-hour online services, all the links, from the enrollment to the graduation ceremony, can be completed online [7]. The emergence of the virtual university diversified the education models.

**Mobile Learning**

Mobile learning and ubiquitous learning can be enabled relying on the internet. Wide availability of high-quality educational resources makes learning activities fully extended. Students can start learning processes anywhere and anytime. Therefore mobile learning and ubiquitous learning have risen in popularity.

Mobile learning or m-Learning is defined as a way of learning across multiple contexts, through social and content interactions, using personal electronic devices [8]. Internet technology provides a ubiquitous learning environment, changing the fixed programmed learning style. “Internet + education” makes situational learning more flexible and can be started anywhere and anytime. In the era of “internet +”, ubiquitous learning and mobile learning are reshaping the way of learning.
Discussions and Countermeasures to Cope with Education Reform

“In confronting the many challenges that the future holds in store, humankind sees in education an indispensable asset in its attempt to attain the ideals of peace, freedom and social justice. [9] “Internet +” impacts on social development and education reforms. We must take measures to cope with changes happening in the field of education and seize the historical opportunity of this great change.

Fragmented Learning

Before the internet age, information is mainly carried on the print media. Now, with the advent of the internet age, more and more information is spread via the network. George Siemens believed that today’s knowledge was dynamic network and ecology rather than static hierarchy and structure, and he compared knowledge of the internet age to the river [10]. The network and print media have totally different characteristics, and the difference as follows (Table 1).

Table 1. A Comparison between Network and Print Media in Structure and Expression.

<table>
<thead>
<tr>
<th>Print Media</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic unit: page</td>
<td>Basic unit: web page</td>
</tr>
<tr>
<td>Mostly texts, a few pictures</td>
<td>Multimedia: radios, videos, animations and streaming media besides texts and pictures</td>
</tr>
<tr>
<td>No hyperlinks</td>
<td>Having hyperlinks, can jump to a specified page</td>
</tr>
<tr>
<td>Linear and tree structure with strict logic and hierarchy</td>
<td>Three-dimensional network structure without strict logic and hierarchy</td>
</tr>
<tr>
<td>Mostly in a unified standard and format</td>
<td>Uncertain standard and format</td>
</tr>
<tr>
<td>Cannot be automatically generated</td>
<td>Can be automatically generated based on some instructions(e.g. automatic generation of a certain search interface by keywords)</td>
</tr>
<tr>
<td>Cannot change</td>
<td>Changeable</td>
</tr>
<tr>
<td>Main existence form: object (book, publication etc.)</td>
<td>Main existence form: digit</td>
</tr>
<tr>
<td>Transmission is limited by space and distance</td>
<td>Transmission is not limited by space and distance</td>
</tr>
<tr>
<td>Content shall be determined by experts and editors</td>
<td>Content can be provided by ordinary users freely</td>
</tr>
<tr>
<td>Complete and structured knowledge system</td>
<td>Often incomplete and unstructured knowledge fragment</td>
</tr>
</tbody>
</table>


Knowledge on the network is often presented in the form of fragment. At the same time, learners also have a short and quick learning in fragmented time. Mobile learning occupies an increasingly important position. The smart phone becomes indispensable learning tool with its lightweight and portable features for mobile learning. Learning is inseparable from high-quality educational APPs on smartphones. Currently large amounts of data from schools can hardly be shared in a standardized form in different independent systems, so the data exchange between educational APPs and school systems remains challenging [11]. In addition, privacy and confidentiality of the data need to be considered. At present, the research on the development of educational APPs should be strengthened to provide students with personalized learning environment.

Technical Support Services

The formation of “internet + education” requires the depth use of education data in the teaching process. Besides educational resources sharing needs cloud computing and other advanced technologies as a support. Therefore, it is vitally important to establish big data platform for education and strengthen the infrastructure construction. Education trading platform is also essential to ensure free transfer of educational resources over the internet.

In addition, appropriate technical personnel are required for the internet education, which poses a great challenge to talent training in the new era. Facing the intensifying education reform, we need to
innovate education concepts, models and methods and cultivate compound talents with high comprehensive quality, strong innovation ability and interdisciplinary professional background.

**Teacher Accomplishment Improvement**

As an essential teaching subject, teachers should adapt to the challenges education reforms brought about. New education cannot do without the internet technology. The internet tools will frequently appear in the teaching process. Teachers should develop their internet thinking, master information technology applications, improve IT literacy and enhance IT teaching skills. At the same time, teachers should make good use of big data tools to understand students by more scientific means.

Service functions should also be strengthened. The roles of teachers and students have changed in the new education model. The teaching process has switched to student-oriented. To help students develop a personalized course menu, teachers should guide students to choose curriculum resources based on students’ characteristics and needs, which requires teachers to enhance their service functions and lead the way to achieve the maximum development of students.

**Macro-Control Tightening**

The development of the “internet +” poses challenges to the regulatory and service capabilities of the government and authorities concerned. According to iResearch, the number of online education users is 7227 million in 2015, and the number is expected to reach 130 million in 2018(Fig.1) [12].

![User Scale of Online Education in China from 2011 to 2018](image)


Figure 1. User Scale of Online Education in China from 2011 to 2018.

The rapid development of internet education is inseparable from policy guidance and government's macro-control. The following aspects of internet education should be supervised by governments.

First, education market should be standardized and access mechanism be improved. There are not only many excellent resources but also lots of negative information on the internet. The government should develop systematic education institutions and establish regulatory mechanisms. In addition, the access mechanism into internet education industry should be improved.

Second, public education facilities should be strengthened. The current infrastructure of traditional schools cannot meet the growing needs of online education. Governments need to make overall plans and lead school transformation to achieve this process. On the other hand, public education infrastructure also needs governments’ financial support.

Last but not least, education fair should be promoted. The unbalanced regional development resulted in the uneven distribution of education resources between eastern coastal and western inland regions. There are less education resources and lack of infrastructure in western regions. This requires the government injecting more educational resources and funds for education development in these areas, and thus to accelerate narrowing the education gap and to implement education fair, promoting balanced development of education in China at last.
Conclusion

Education reform under the background of “internet +” is a large-scale and unprecedented change. The impact of internet on education is comprehensive, but an attempt to solve all educational problems by internet is impractical. The inevitable choices for us are to conform to the trend, identify the origin, update education concepts and modes by the continued use of internet thinking, and promote the formation of “internet + education” relying on internet technology positively.

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