

Learning on The Fingertips: The Opportunities and Challenges of Educational Apps

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Abstract

Today, using spare time to learn is the key demands of mobile education field. With the characteristics of portability, educational Apps highly fit for this kind of demands, and contribute to the learning style on the fingertip, it becoming the new growth direction and growing point of mobile education. The understanding of the present situation and Prospect of educational Apps is the basis for further research on educational Apps. Based on introduction of educational Apps, this paper discussed the opportunities and challenges of educational Apps faced: mobile terminal and wireless network, the use habit of the user, mobile learning and online education market create good conditions for the development of educational Apps, at the same time, the imbalance of development, poor quality and unclear business model is the restriction factors of the development of educational Apps. This paper points out that enhance the quality, balanced development, enrich and develop market strategy is the key to make a breakthrough in the predicament, realize rapid development of educational Apps.

Key words: Educational Apps, Mobile education, Mobile education Application

1. The Introduction

The evolution of the media influences the development of education. At present, Smart phones, handheld computers sparked an educational revolution(Anya Kamenetz, 2010). From personal computers to the rise of big data, Internet of things and other technologies, emerging technologies lead to the transformation of educational means, methods and content(Kathy Hirsh-Pasek et al., 2015). Today, using spare time to learn is the key demands of mobile education field. Smartphone, tablets and other mobile terminal equipped with application, learning process from PC to mobile terminal becomes a new trend, education app is the new direction and growth of mobile education(Carlos Alario-Hoyos, Iria Estévez-Ayres, Mar Pérez Sanagustín, Derick Leony & Carlos Delgado Kloos, 2015).

Mobile Apps has only a few years since its birth, but its speed of development and the impact on people's lifestyles are amazing. The first mobile Apps was born in 2008 in Apple Corp. Today, the mobile Apps occupied the desktop of smart phone and tablet, The application of mobile Apps contained everything almost, such as shopping, entertainment, payment, learning and so on. The portable mobile app highly fit the characteristics of the modern social life of quick rhythm, fragmentation, it made people's life, work and study are more convenient, the mode of information processing on fingertips are expanding and deepening in various fields.

App, is the abbreviation of Application, means some kind of technology, system or product application. Application is not a new thing, all kinds of software running on personal computers are Application. But since the applications of Apple Corp mobile had be published, Apps has more refers to the application software running on smart phones and other mobile terminals, known as mobile applications, mobile client, etc.. In this paper, the educational Apps only refers to the application of mobile education, does not contain the educational application running on personal computers.

What kind of influence of mobile Apps in the field of Education? Software is eating the world. All of the technology required to transform industries through software finally works and can be widely delivered at global scale. Health care and education are next up for fundamental software-based transformation(Marc Andreessen, 2011). By November 2014, the total number of education App in China has more than 70,000, about 10% of mobile Apps market(Sina Education, 2014). Mobile Apps popularity in education field has contributed to the

new learning sytly, use of smart phones, tablets and other mobile terminals to learn at anytime, anywhere. At present, App is mainly concentrated in the foreign language education, preschool class, test platform and K12 etc.. Ease to use and satisfind to the user personalized, educational Apps is welcomed by students. with the popularity of smart phones, educational Apps has become an important channel for online education(Stephanie Banchemo & Stephanie Simon, 2011).

The development prospects of educational Apps are generally good(Watlington, 2011). In the field of mobile applications, in addition to the game, the most market potential is the educational Apps. Huge user base and stable education expenses make educational Apps have huge market and development space(Sina Education, 2014). With the popularity of smart phones and other mobile terminals and social capital investment in research and development, educational Apps undoubtedly ushered a good opportunity for development. Yet the challenges that it faces are not negligible. From the current situation, the development of Apps in education is not balanced, the quality is not high, and has not formed an effective business model is the bottleneck restricting the development of educational Apps.

2. Opportunities for educational Apps

The rapid development of educational Apps, are inseparable with good development opportunities. Firstly, the popularity of smart phones, Wi-Fi and 4G wireless network provides a good basis, Secondly, App popular developed the people's habits of using educational Apps, it contributed to them trust and dependence to educational Apps, thirdly, mobile learning idea strikes root in the hearts of the people and the online education huge market space is the demand and driving force to develop educational Apps.

2.1 Mobile terminals and wireless networks provide the basic condition

Smart phones, tablet and other mobile terminals are the material basis for the development of education App, its popularity directly determines the extent of the development of educational Apps. Smart phone is the mobile terminal which has highest rate of people have, from its size can understand the current development of mobile terminals. According to the China Internet Network Information Center released the "thirty-fourth China Internet network development survey report", as of June 2014, China's internet users reached 632,000,000, and the size of the mobile phone users reached 527,000,000 (China Internet Network Information Center, 2014). Figure 1 Comparison of mobile phones, laptops, desktop Internet access.

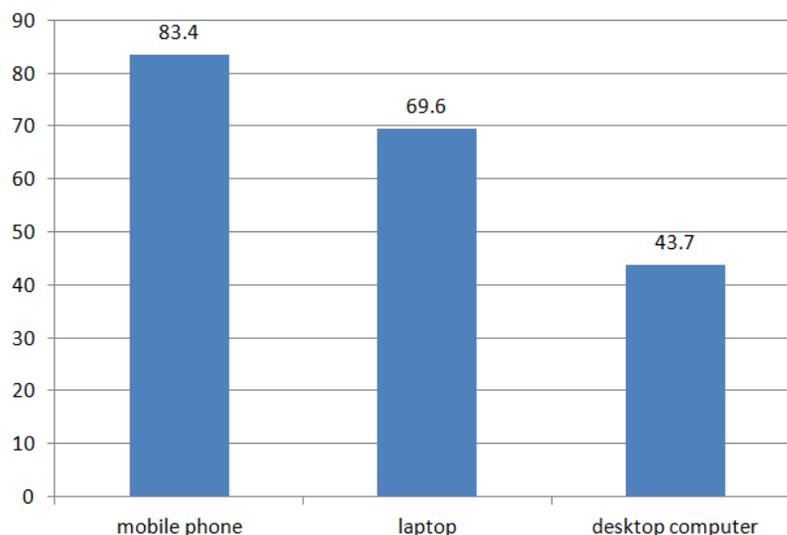


Figure 1. Comparison of mobile phone, laptop and desktop computer

In all Internet devices, mobile phones, laptops and desktop usage rates were 83.4%, 69.6% and 43.7% (China Internet Network Information Center, 2014), the mobile phone has become the first major Internet terminal. With the improvement of the processing power of the smart phone, more and more information processing activity is transferred from the PC to the mobile terminal, the popularity of mobile terminals provides a good hardware foundation for the development and application of educational Apps.

Good network environment is another basic condition for developing educational Apps. At present, mobile wireless network and Wi-Fi hotspot is the main way to access the network. By wireless network, users download educational Apps and achieve the information load, so the convenience and bandwidth of network is essential to the development of mobile education application.

China's mobile wireless network has begun upgrading for the fourth generation. The signal, speed and other aspects of wireless network get a comprehensive upgrade to meet the needs of mobile terminals for higher data traffic. Compared to the mobile wireless network, Wi-Fi is the best choice to users because of free. The full name of Wi-Fi is Wireless Fidelity, that is, wireless high fidelity. In fact, the Wi-Fi alliance is in conformity with the IEEE 802.11 standard and the wireless local area network equipment brand authentication. The advantage of Wi-Fi technology is that the transmission speed is high, the power is low, the radio wave covers a wide range, and the effective transmission distance is long. Wi-Fi to complement as wired broadband wireless extension and mobile broadband network, effective shunt flow data and become an important means of schools, families, shopping malls, hospitals, hotels, restaurants, airports, railway stations and other public places to use the Internet.

Strategy Analytics, a market research firm, has investigated the prevalence of Wi-Fi in 17 countries around the world. At the end of 2011, the world has 439,000,000 Wi-Fi home users, accounting for one fourth of the world's home users. In the popularity rankings of Wi-Fi family users, South Korea topped 80.3%, followed by 73.3% in Britain, And China is ranked 21.8% in the fifteenth place, but due to the huge population, China is the highest number of Wi-Fi families. It is expected that to 2016, China will have 110,000,000 Wi-Fi home users (hylink, 2014).

Mobile wireless networks with Wi-Fi has formed the development pattern of complement each other, make smart phones and other mobile terminal to access the Internet more and more convenient, it better meet the user high bandwidth applications, and provides a powerful network security to the development of educational Apps.

2.2 User's habits of using mobile Apps

In the era of fragmentation, people hope to use the fragmentary time. Mobile applications play an increasingly important role in the use of fragmented time. Smart phone users usually use Apps when go to bed, at the weekend, on the way to work, travel, rest, or wait for somebody. People enjoy the life on fingertips, and more and more things are transferred from PC to mobile phones. According to Nielsen, a market research firm, from 2011 to 2013, the consumption time ratio of users browsing web through mobile terminal fell from 27% to 13%, while the use of Apps time accounted for ratio increased from 73% to 87% (hylink, 2014), people spend more time on Apps than web. This change means that the mobile phone users rely on Apps is enhanced and formed the habit of using Apps.

The popularity of educational Apps, benefit from the application of the Apps environment, but also promote the further development of Apps. At present, the student group is the largest mobile phone users. With the popularity of smart phones and the full coverage of the wireless network, the students are growing dependence on educational Apps. Students use educational Apps often experienced the process from others introduce, web advertising, to actively search according to their own need. In this process, on the one hand it strengthen the experience of using educational Apps, on the other hand, deepen the dependence on educational Apps. Students interact with the world through Apps and obtain knowledge and information, has formed the Apps as the medium of study way -- the study on the fingertips. From check vocabulary to recite words, from homework to the test, a group of mature and excellent educational app had got recognized by student groups, educatio Apps has become a powerful helper to learn. From the user's point of view, a good use of experience, habits and the depth dependence on the educational Apps are important reasons for the rapid development of educational Apps.

2.3 The market demand of Mobile learning and online education

Mobile learning research began in 1994 at Carnegie Mellon University Wireless Andrew research project (Fu Jian & Yang Xue, 2009). 2000, Irish experts in Distance Education named Desmond made a report entitled "from the remote learning to e-learning to mobile learning" in Shanghai TV University founded 40th anniversary conference, mobile learning concept is introduced for the first time in China, then set off the upsurge of research on mobile learning. Mobile learning is based on the computer and wireless network to carry out, in any time, any place to learn. Mobile learning is in the fast rhythm of modern people, the life characteristics of debris, at any time, the concept of learning at any time, in practice, has been greatly developed. Although the concept of mobile learning is earlier than mobile Apps, but the characteristics of portable enable smart phones equipped with educational Apps become the new darling of the mobile learning. Educational Apps is fit for the idea that mobile learning in any time, anywhere, and naturally becomes a medium and a tool for mobile learning. Therefore, educational Apps will be the main battlefield of mobile learning, mobile learning development, will inevitably lead to the development of educational Apps.

Online education is another important area of educational Apps. With the popularization of the Internet, online education mode is gradually recognized by users, more and more traditional education institutions, Internet companies have set foot in the field of online education. Compared with western developed countries, China's

online education industry is still in its infancy, business model and market competition pattern is not yet mature, with a larger market space for development. iResearch consulting online education market survey report shows that in 2013 China's online education users reached 67,200,000 people (iResearch, 2014). From the learning tool, PC is still the mainstream of online education, but the mobile terminal learning growth obviously. With the popularization of intelligent terminals and the change of user habits, real time interactive in mobile platforms will be the key point of online education. And the introduction of independent Apps become an important step. With the future development of Internet penetration and online education consumption habits, online education to mobile terminal expansion will be the inevitable direction.

3. The challenge of Educational Apps

Mobile applications has made remarkable achievement in the field of education, the situation is gratifying and prospects are generally optimistic. But overall, the educational Apps industry is still in the initial stage of development, the stock of educational Apps is filled with a lot of "zombie application", lack of good works, low willingness to pay, quality need to be improve and other issues. Investigate its reason, educational Apps front to the challenge of development is not balanced, the quality is inferior and the business model is not clear and so on.

3.1 The development of the Apps education is not balanced

Educational Apps imbalance development reflected in three aspects. First, children's educational Apps is a hot spot, but the adult educational Apps lack of development. Young children are increasingly engaging with digital media (Schuler, 2012). A mobile media revolution that is changing the lives of adults, and now children of all ages, is under way across the globe (Cynthia Chiong & Carly Shuler, 2010). According to the statistical data of the Store App, in Apps education, early educational Apps for under 12-year-old children accounted for 55.5%. Since the birth of Apps, all kinds of children's education App come out, more and more Internet Co, traditional publishing organizations and individual developers run into the Apps field of children education, so that the field has been fully developed. The content refined to children's stories, encyclopedic knowledge, mathematics, thinking training, language learning, folding and music art edification. Children's educational Apps over aggregation, product homogeneity serious. Take the study Apps of Tang poetry as an example, by search engine, we can find a number of Three Hundred of Tang Poetry mobile Apps, and there are few difference. This phenomenon is directly related to the over development of the children educational Apps. In contrast to this, the Apps of adult education is totally short and lack of refinement.

Second is English educational Apps is developed, but other subject category of educational Apps still under development. From the perspective of subject categories, language educational Apps showing a hot trend of development. English educational Apps has a large rigid demand in the students and other groups, so has a large market share. In words, listening, reading and other aspects, there is no lack of excellent mobile Apps for the user to choose.

Third is the educational Apps often points to informal learning, and out of line with classroom teaching. At present, the content of educational Apps is often scattered and isolated, and has not formed a system, which is on the edge of classroom teaching. The content of learning determines that educational Apps is more than informal learning, it is difficult to form a complete set of teaching in the classroom, which limits the depth and breadth of the development of educational Apps in a certain extent.

3.2 The quality of educational Apps needs to be promoted

Quality is the life of product, for the same with educational Apps. Many mobile education applications are low level of development, production of rough, the lack of user perspective, the homogenization of serious, old content. Causing users do not want to pay for educational Apps. How to improve the quality of educational Apps? The research thinks, educational Apps must have rich content, in the premise of scientific nature, appropriate use of multimedia, in order to create the user's perspective, to ensure that the level of educational Apps. The quality of educational Apps can be attributed to the following several aspects.

Firstly, many products lack of content support. In the construction of educational resources, the content is key point, which is also suitable for Apps. Content is key point not only requires learning content is relatively complete and rich, while the content of the formation, updating, to maintain the user experience of the product fresh. A lot of educational Apps, build a platform or application framework, but the lack of content, severely limiting its promotion. Good functional framework is the first step for the successful application of mobile education, and get the user's recognition, integrity, and can update the learning content is also the important factors.

Secondly, products lack of deep processing. Simply moving the learning contents is a common problem of

many educational Apps. The traditional content is copied to the mobile terminal, the value of the Apps is not found in the place, only to be reduced to change in reading, application form, it is difficult to be accepted by consumers. In fact, from textbooks to Apps, the carrier of education information changed, the interactive mode is changed, the information channels also changed, which means that the application of mobile education needs to make second creation on the basis of traditional learning content. The design of the application is very important, especially in the media of teaching information. According to the learning content and rational use of text, images, audio, video and animation and other forms of media, improve the appropriate of media and learning content and create the beauty, rich media, interactive and mobile applications, to improve the user experience, improve product satisfaction.

Thirdly, products lack of scientific and educational. The science and education is a remarkable feature of the educational Apps, which is different from other mobile applications. Educational applications involving professional knowledge, but many developers do not have formal educational qualifications, content often not precise enough, even exist scientific errors, excessive emphasis entertainment and neglect the education. Excellent mobile education application integrate education and technology deeply, so required the developer not only good at technology, but also understand the education. Therefore, the educational Apps developer needs to have the corresponding professional knowledge, in order to guarantee the scientific and rigor of learning content. In addition, the developer must have a certain teaching design experience, so that to find a balance between entertainment and education for educational Apps.

Fouthly, products lack of user perspective. Many developers of mobile education application design product by subjective idea, did not fully coducider the needs of learners, lead product is not popular. Emphasize the user's perspective, is to take the needs of learners as the starting point, fully study the characteristics and the key need of learner, to help developers to clarify the work design ideas. The core function of educational Apps, easy to use, artistic, interesting and other factors directly affect the learning experience, should be paid enough attention. Also, preaching for entertaining and enhanced to meet the personalized needs of users will enable educational Apps more popular and win recognition of learners.

3.3 The business model of educational Apps is not yet clear

The development of educational Apps can not be separated from the market, the business model directly affects the speed and scale of its development. Mobile education applications field has great potential, but many Apps providers stop at the entrance of the profit. Educational Apps market is growing, free application is majority, has not yet formed a clear business model.

Mobile applications profit mainly in two ways, one is charge download, the two is free of product with embedded advertising. At present, users keep cautious attitude to the mobile education charges, purchase intention is lower, the free application of embedded advertising, as the application of quality and service to determine whether to use or not. Overall, educational Apps to achieve profitability is not optimistic. On the surface, the difficulty of educational Apps earnings related with the user's willingness to pay for the product, but in-depth analysis will be found, the user pays will depend on two factors: First is the comparison of similar products, followed by the basic judgment of product performance ratio. In the face of an educational Apps products, users tend to search for similar products, looking for free or low-priced products. In children, English and other products homogenization serious areas, it is easy to find similar free educational Apps, the user will naturally not choose to buy products. Only when absence of similar free products, users will be compared to the cost of the product, and make a judge to purchase or not. Therefore, high quality is the essential condition to realize the education app earnings. Only through in-depth research and development, avoid the homogenization of competition, provide high quality products and reasonable and flexible price strategy is the way to solve the problem.

On the premise of high quality, enrich and expand the market strategy will help mobile education application out of the plight of profit. Firstly, in terms of price, can be emulated with the price of the Chinese market of Apple App Store, The price of the product is not monolithic, but launched the introduction of one third yuan preferential activities, cater the expectations of China users for high quality and low price, win with quantity, to achieve the win of users, developers, and store. Secondly, through the combination of online and offline entities, format a cohesive force, avoid relying solely on Apps earnings, to achieve the overall profitability. This strategy can effectively avoid the siege of piracy and "copycat". Thirdly, In the launch of a series of mobile applications, the first application of free experience, training users, the user's praise and recognition, the subsequent application of reasonable charges. Fourthly, Encourage users to increased the time of using Apps and strengthen the using experience, convert the user's loyalty and stickiness into virtual wealth, such as integration, virtual

currency and so on, to win total users and traffic. Fifthly, To encourage the old user to recommend new users, make price concessions to them all, achieve precise positioning of the user base and rapid growth. At last, through various channels of communication and marketing means to promote, improve the awareness of the application is to gain an effective strategy to gain market share.

4. Discussion and Conclusion

Today, The learners are more and more demands on the study of learning anytime and anywhere. Educational Apps will become a new direction of mobile learning and new growth point. With the development of mobile terminal hardware and wireless network, the application of Apps is becoming more and more mature. The learners' awareness and use of educational Apps continues to improve, more and more business organizations and individuals to join the Apps development of the education camp, educational Apps presents a good development prospects. At the same time, as a new thing, the development of educational Apps is not balanced, the quality is not high, the business model is not clear. It need to guide the application of mobile education in the macro, and enhance education app quality, enables users to obtain a good user experience, rich sales model, combining the price and experience, integration in micro, to win the user's willingness to pay. In short, it can be predicted that with its portable and interactive features, educational Apps is contributing to a new way of learning – learning on the fingertips.

In future research, there are four main directions worthy of further study. Firstly, how to use the existing multimedia resources to enrich the educational APP content. Secondly, how to combine educational Apps with school education. Thirdly, how to Improve the experience of the use of APP, and improve the efficiency and effectiveness of learning. Fourthly, Provide personalized services based on large data.

References

- Alario-Hoyos, C., Estévez-Ayres, I., Sanagustín, M. P., Leony, D., & Kloos, C. D. (2015). My Learning Mentor: A Mobile App to Support Learners Participating in MOOCs. *Journal of Universal Computer Science*, 21(5), 735-753.
- Andreessen M. (2011, August 20). Why Software Is Eating The World'. *Wall Street Journal*.
- Banchero, S., & Simon, S. (2011, November 12). My Teacher is an App. *Wall Street Journal*.
- China Internet Network Information Center. (2014, July 21). thirty-fourth China Internet network development survey report. Retrieved from http://www.cnnic.net.cn/hlwfzyj/hlwzxbg/hlwtjbg/201407/t20140721_47437.htm.
- Chiong, C., & Shuler, C. (2010). Learning: Is there an app for that. In *Investigations of young children's usage and learning with mobile devices and apps*. New York: The Joan Ganz Cooney Center at Sesame Workshop.
- FU, J., & Yang, X. (2009). A bird's-eye view of China Mobile learning theory and practice. *China Educational Technology*, 7, 36-41.
- Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting Education in "Educational" Apps Lessons From the Science of Learning. *Psychological Science in the Public Interest*, 16(1), 3-34.
- HYlink. (2014, June 1). Research on the development of brand marketing Apps. Retrieved from http://www.hylinkad.com/template/activity_content.php?activityID=57.
- iResearch. (2014, June 5). China Online Education Report. Retrieved from <http://report.iresearch.cn/2174.html>.
- iResearch. (2014, July 2). China WiFi Rental Report. Retrieved from <http://report.iresearch.cn/2209.html>.
- Kamenetz, A. (2010). A is for app: How Smartphones, handheld computers sparked an educational revolution. *Fast Company*, 144, 60.
- Shuler, C., Levine, Z., & Ree, J. (2012, January). iLearn II: An analysis of the education category of Apple's app store. In *New York: The Joan Ganz Cooney Center at Sesame Workshop*.
- Sina Education. (2014, November 18). The total amount of educational Apps is more than 70,000 in China. Retrieved from <http://edu.sina.com.cn/l/2014-11-28/1833253410.shtml>.
- Sina Education. (2014, November 28). Online education industry voice: three to five years will have a complete system. Retrieved from <http://edu.sina.com.cn/l/2014-11-28/1707253378.shtml>.
- Watlington, D. (2011, March). Using iPod touch and ipad educational apps in the classroom. In *Society for Information Technology & Teacher Education International Conference* (Vol. 2011, No. 1, pp. 3112-3114).

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