

Opportunities and Challenges of Digitalization of Educational Publishing Industry in Post-epidemic Era

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Abstract. With the development of information technology, the Internet has gradually become the basis for human information dissemination. The emergence of this new information dissemination and communication tool not only provides convenience and efficiency for modern educational publishing, but also rapidly and strongly changes the industrial structure and development logic of the educational publishing industry. The sudden lockdown brought about by the COVID-19 epidemic has gradually transformed education from offline to online, which has accelerated the digitalization of the education publishing industry. In the post-epidemic era, how to improve digital textbook resources, how to provide educational content supply from multiple dimensions, and how to establish a new future-oriented educational publishing system are all issues that the education publishing industry needs to think about in the process of digitization.

Keywords: Post-epidemic Era; Education Publishing; Digital Publishing; Digitization.

1. Introduction

The rapid development of information technology represented by the Internet. In particular, the arrival of the 5G era has revolutionized the way people acquire information and learn knowledge. Internet technology, as an independent variable to promote the change of economic and industrial development pattern, has evolved from a single technical tool to information energy. Cloud computing, big data, AI, VR interaction, and live broadcast technology will open up a new mode of "human-computer interaction" and "human-network interaction". Before the COVID-19 pandemic, the educational publishing market was considered to be the slowest integration in the capital market in the reshaping of the industrial chain driven by the Internet. However, the COVID-19 epidemic that swept the world in 2020 has further accelerated the widespread application of online teaching models based on information technologies such as the Internet, bringing new growth and momentum to the education publishing industry. Under the new situation of technology-enabled education and publishing, traditional paper textbooks have been unable to adapt to the multi-dimensional, three-dimensional and open teaching model of today's era. The digital business empowerment brought about by technological progress has made publishing, media and education show a trend of integrated development based on shared resources. The digitization process of education publishing model, its driving force is from digitization, mobilization to interaction. The presentation has also become rich media. In this context, this article aims to analyze how to explore the future form of educational publishing through the fusion media innovation of "education + publishing + technology".

2. Literature Review

According to McLuhan's periodization of human history from the perspective of communication (McLuhan and Lapham, n.d.), digitization is the latest stage of the electronic communication period after oral communication and printed communication. Ross revisits the publishing environment in Publishing in the digital age. He believes that the use of information technology to narrow the digital divide can bring transparency of educational publishing content resources and easy access to data (Ross, n.d.).

Rojers P. Joseph explores the impact of content digitization on four key aspects of higher education book publishing, namely "Technical Elements of Publishing", "Publishing Economics", "User Attitudes and Preferences" and "Copyright Issues" (Joseph, 2015). Japanese scholars Shin-nosuke Suzuki and others proposed a new type of Active-Textbook, which uses general portable electronic

terminals such as smart phones and system application software. Active-Textbook can evolve ordinary textbooks into digital textbooks with additional digital information, and various digital resources (such as movies, animations, 3D views, etc.) are available (Suzuki, Akimoto, Ishihara and Kobayashi, 2017).

COVID-19 has had a profound impact on the publishing industry. Digital reading has deepened due to the globalization of this epidemic. Electronic publications will become a more important form in the publishing field in the future. Publishing houses have also launched various online education services based on educational publishing. Dianshun Ren and Zishuang Kang believe that during the epidemic, most teachers and students showed precise needs for digital textbook resources, online teaching systems, and after-school homework systems (Ren and Kang, 2021). Online education has become the norm.

The need to protect data privacy is increasing as the online distribution of data advances by leaps and bounds, and many people are at risk of security breaches. Tamanna Rahaman argues that as more and more school education systems move online, this publicly available academic information may infringe on student privacy (Tamanna, Md. Muktar, Fahmida and Farah, 2021).

3. The online education boom and the digital transformation of educational publishing during the epidemic

3.1 The changing role of educational publishing in the context of informatization

In the context of the information age, technological changes have made it extremely easy for readers to "reach" for information or knowledge. This not only puts forward higher requirements for the breadth and depth of content produced by educational content producers, but also tests whether "content producers" can innovatively meet readers' personalized knowledge needs.

Looking at the digitization process in the field of education publishing in recent years, its driving force has changed from digitization, mobilization to interaction. The delivery form is gradually changing from static, one-way e-books, electronic education, MOOC to dynamic, lightweight, and more interactive micro-lectures plus teaching assistants (Knox, 2014). The transformation of educational publishing should first start with role positioning, transforming from a pure content producer to an educational service provider, based on the continuous satisfaction of the diverse learning needs of learners in the new era. And from the organizational structure, product form, marketing promotion, personalized service and other aspects to build a closed-loop innovation model for education services.

3.2 Education informatization promotes the digitization of education publishing

3.2.1 Research and development of new forms of textbooks

Even in the all-media era, from the perspective of audience experience, as a product of knowledge materialization, the highly immersive and ritualized reading experience of paper publications cannot be surpassed by other carriers in a short period of time. Paper textbooks have obvious advantages such as complete structure, rigorous content, and standardized expression, and their basic supporting role in teaching activities will not change. However, the carrying capacity of traditional paper textbooks for subject knowledge and information is limited and single, which cannot meet the needs of learners to expand and extend their learning. Traditional textbooks must actively adapt to the changes in the reading habits of audiences and the way of receiving information in the Internet age, and focus on core knowledge points or skills points and their orderly paths, develop online resources in rich forms, and provide students with value-added content services.

The teaching materials can effectively make up for the lack of paper teaching materials in the form of expression by linking a large number of dynamic resources such as demonstration programs, animations, and micro-lectures. As a communication medium that cannot be ignored in the integrated development of education and publishing, the Internet has brought subversive changes to students'

reading habits and study habits due to its fragmentation, interaction, and sharing characteristics. In the Internet age, it should be enriched and supplemented based on the content of paper textbooks, and various information technologies should be fully used to combine content resources with various media, so as to realize the coordinated configuration of various resources. In the process of integrating paper teaching materials and multimedia resources, the QR code as a connecting medium has well realized the intelligent reconstruction of traditional high-quality content resources. With the help of mobile smart terminals, students use the QR code on the paper book as the entrance to "scan the code and learn at any time", so as to switch between paper media and digital media at will, so as to obtain more knowledge information and services.

3.2.2 Creation of digital courses and online platforms

The COVID-19 outbreak in 2020 has had a negative impact on many industries, but the global "suspended classes, non-stop teaching, and non-stop learning" have brought online education to the forefront. When students cannot return to school, they have to study online. During the epidemic, although a variety of online education methods have emerged, live interactive classrooms through software such as ZOOM and Tencent Conference are undoubtedly the most important and innovative form.

This means that educational publishing is no longer limited to providing teaching materials for teaching, but provides full teaching services from teaching research, curriculum design, resource development, teaching activity support, teaching evaluation to teacher training. Digital courses and online platforms have created functions such as updating the content of knowledge sources and collecting the learning needs of end readers, which are not available in traditional publishing formats. In this way, the scale and agglomeration benefits of digital products can be realized(Zong, 2015).

Taking China as an example, during the epidemic, "www.icourses.cn", as China's online digital course construction and application platform, provided technical support and operational guarantee for the construction and application of higher education digital courses. The platform has a complete and effective functional system of course production, content editing, teaching activities and learning services, and can provide optimal solutions and operational services for course resource integration and teaching activities according to the characteristics and attributes of different courses. At the same time, the platform also records learning data for learners. Provide technical support for course sharing and mutual recognition of credits between different schools. Good data mining and data analysis functions can also provide corresponding analysis reports and consulting services for education management departments, universities and learners.

"China University MOOC" has released more than 7,000 online open courses from more than 600 colleges and universities, and "School Cloud" has settled in more than 500 colleges and institutions. The platform continuously strengthens cooperation with course development teams and courses using schools. Effectively serve teaching modes such as blended teaching and flipped classroom in a variety of ways, and promote student-centered curriculum reform. In this way, high-quality curriculum resources can benefit a wider learning group.

4. The development direction of education publishing under the new format of technology empowerment

4.1 Immersive scenario construction of educational publishing in digital transformation

The development and application of intelligent media publishing, speech recognition, image recognition, voice interaction, VR, AR, and AI technologies have led to the emergence of online platforms, courses, books, learning resources and online academic guidance. As a result, the education publishing industry has been transformed from "knowledge reproduction and distribution" as the core to "knowledge dissemination services". In the process of new industry reshuffle and digital transformation, the construction of "immersive scenes" based on ecological remodeling brings new market opportunities for educational publishing(Lim, 2020).

For immersive scene construction, 4G technology is difficult to load a huge amount of calculation, and a large number of dynamic scene changes will be affected by delays. But 5G commercialization solves this problem. Through the deep connection between VR and AR teaching and 5G communication technology, knowledge distribution, dissemination, and application are integrated and scene-based, which can provide users with an immersive, practical and interactive virtual reality environment. For example, the project "A Thousand Years Long River - Cultural Landmark VR on the Beijing-Hangzhou Grand Canal" jointly developed by China Education Digital Publishing Co., Ltd. and Hongsedibiao Company, relying on special VR glasses, allows the experimenter to experience the historical changes of the canal. This virtual reality presentation "lives" the teaching materials and "lives" the boring historical content.

The construction and application of immersive scenes breaks through objective time and space constraints, and provides "anytime, anywhere" digital reading scenes suitable for different environments. Through audio-visual interaction, more people can enjoy an immersive reading experience. By creating an immersive scene and providing flexible reading and learning options, users' love and loyalty to online and offline educational publishing products and services has been enhanced, and the market competitiveness of educational publishing institutions has been enhanced.

4.2 "VR+ Educational Publishing" boosted by 5G technology

VR, or Virtual Reality, refers to the use of computer technology to simulate a three-dimensional virtual space that provides users with visual, auditory, tactile and other sensory simulations(Shen, Zou, Chen and An, 2020).

One of the distinguishing features of VR technology is immersion. Using 3D models and transmission equipment, the abstract, general and boring knowledge and flat discussion methods in traditional paper publications are transformed into a three-dimensional, vivid and dynamic simulation environment(Yang, 2021). Let learners understand and memorize knowledge through intuitive feeling. One of the other distinguishing features of VR is interactivity. That is, it enables learners to integrate into the simulated environment as the protagonist, participate in activities from a first-person perspective, and realize spatial interaction, paper-screen linkage, and human-computer interaction.

Google is offering some schools in the UK an "Expeditions Pioneer" project to promote its new educational solutions to classrooms. It's a new way to allow students in the classroom to use a mobile VR platform to simulate scenarios for exploring history and education. Google's Expeditions system allows teachers to guide all students through famous sights in a virtual environment, and can even start or stop the VR experience for an entire classroom of students at the same time, as well as control what's being told. This is a unique element of the VR social experience and is intended to increase its appeal to consumers.

Educational publications created using VR technology integrate digital teaching materials, audio, video, micro-lectures, assessment systems, educational games and other online educational products and tools. This greatly enriches teaching materials, opens up online and offline link channels, and changes the separation of online and offline electronic resources for most educational publications.

5. The dilemma of educational publishing in the digital age

5.1 The digital transformation of educational publishing is limited to instrumental applications

Online education is a cross-school and cross-regional education system and model. It replaces the traditional teaching model with a new generation of information technology, and realizes an innovative education model with efficient classroom paperless and zero-distance exploration. This change is not a simple superposition of digitization and education, but the reconstruction of the educational ecology through digital thinking, and it is not the application of tools or the repair of details.

The current education informatization has not grasped the problems of serving teaching, serving teachers, serving students, serving assessment and evaluation, and serving management (Broich, 2015). There is no clear core concept of "application is king". The core concept of the so-called "application is king" is not to treat the platform system as an ordinary tool. It should be an ecosystem that enables your organization to operate in a fully closed loop online, from front-end to back-end, from customer acquisition to operation to transformation, and it must be a perfect fit. Therefore, promoting the digital transformation of all elements, all businesses, all fields, and the whole process is the core of education digital transformation.

5.2 Risk of network security vulnerability

The production and distribution of digital educational publications are backed by massive amounts of data, and people's ability to make judgments about them is rather limited. Especially when big data technology replaces editors to select topics, the construction of content is a recombination of "knowledge elements", and the marketing process mainly relies on accurate push by machines. This will inevitably lead to changes in publishing ethics and norms.

The rise of technology has made all kinds of information available to anyone and everyone. While easily accessible data makes our lives easier, it also has a downside. With so much personal information we have online, the privacy of many is at risk (Tamanna, Md. Muktar, Fahmida and Farah, 2021). The learning process is closely related to the learner, and the source of the learner's own data acquisition is also a sensitive privacy topic. How to ensure the privacy of learners and how to obtain data legally and compliantly without being abused are also issues that need to be faced at present and in the future. With the development of technology, people are becoming more and more invisible in front of technology.

Theft of Internet browsing records, consumption records, call records, message records, etc. has already occurred. But everyone is a content generator. How to trace and protect the copyright of each individual's digital content will also lead to further discussion.

5.3 The copyright ownership of online educational publications is unknown

Online education involves multiple stakeholders such as schools, teachers, students, and online education platforms. The attribution of copyright of online educational works has become a difficulty in copyright protection.

First of all, when making courseware, teachers inevitably use other people's copyrighted documents, pictures, data, and even audio and video materials. However, the openness and replayability of online education courses determine that the scope of influence of rights exceeds the scope of fair use.

Second, differences in how online educational works are produced often lead to copyright disputes. In general, live or recorded courses only require teachers to use notebooks, networks and courseware made by themselves. There is no objection to the ownership of the copyright of the formed works. However, educational publications provided by educational platforms not only require teachers to produce and teach courses, but also post-processing of educational platforms. Therefore, the role played by educational platforms must be considered.

Third, it is very difficult to safeguard the rights of copyright infringement of online educational works. It is difficult to determine the subject of infringement, and electronic evidence is easily lost. User shaping of Internet content has created the openness of the Internet architecture, and the borderless nature of the Internet has increased the difficulty of copyright protection of online educational works. Online educational works are illegally resold through online platforms, and buyers arbitrarily copy, download, or even resell them again, expanding the scope of infringing subjects and exacerbating the difficulty of identifying defendants in judicial rights protection.

6. Conclusion

The COVID-19 pandemic has forced schools to suspend in-person instruction. Therefore, the educational publishing business has been broken from the original pattern. Because the printing supply chain of publications is interrupted, educational publishing has to shift its center to the digital transformation and upgrading of the publishing industry. The demand for distance education and learning is growing exponentially. Digitization is no longer an add-on to the educational publishing industry (Brinton, 2021). It became driven by customers (schools, teachers, students, etc.) with the intervention of COVID-19. The core agenda of digital educational publishing requires a digital mindset to ensure its survival and growth after the COVID-19 pandemic is over.

The digital wave of educational informatization and educational publishing is unstoppable. Under this background, teaching materials are also undergoing profound changes, from three-dimensional teaching materials to new forms of integrated teaching materials, to new forms of integrated teaching materials based on hypermedia technology (Wu, 2022), behind the changes in product forms are people's exploration of the nature of education. Serving education is the fundamental purpose of educational publishing. The future model of educational publishing, whether it is the form of media, editing and production methods or application scenarios, is to serve the personalized and intelligent learning process in the future. Its wide application will help improve the ecological chain of educational publishing and provide assistance for the process of educational informatization.

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