Article

Promoting Cross-field E-Commerce Development by Combining Educational Background and Technology

Jiangnan Huang [1,*]

[1] King Graduate School, Monroe University, New Rochelle, 10801, United States

* Correspondence: Jiangnan Huang, King Graduate School, Monroe University, New Rochelle, 10801, United States

Abstract: With the rapid advancement of technological innovation, the educational background increasingly plays a prominent role in supporting and promoting cross-domain e-commerce development. This paper explores the supporting role of education systems in nurturing talent and fostering technological innovation, and delves into the application of big data, artificial intelligence, and blockchain technologies to optimize e-commerce marketing, predict consumer behavior, and improve supply chain efficiency. At the same time, it proposes strategies that combine education and technological innovation to promote the development of cross-domain e-commerce, including suggestions for industry-university-research cooperation, interdisciplinary education, and policy support. It aims to inject innovative vitality into cross-field e-commerce.

Keywords: educational background; technological innovation; cross-domain e-commerce; personnel training; coordinated development

1. Introduction

With the rapid development of global e-commerce, technological innovation has become a key force to promote industry change. At the same time, educational background plays an indispensable role in the development of the e-commerce industry. The education system not only plays a fundamental role in the cultivation of talents but also provides strong support in the application and promotion of technological innovations such as big data, artificial intelligence, and blockchain. These technologies are profoundly changing e-commerce marketing, consumer behavior analysis, and supply chain management. How to cultivate interdisciplinary talents who meet the needs of the e-commerce industry through the education system, and promote the mutual assistance and mutual progress of education and technological innovation, has become the core topic of sustainable innovation and development of cross-domain e-commerce. This paper aims to explore how education and technological innovation can cooperate to promote the deep integration and development of cross-industry e-commerce.

2. The Role of Educational Background in Promoting the Development of Cross-Field E-Commerce

2.1. The Impact of Education System on the Training of E-Commerce Computer Technology Talents

The education system plays a crucial role in training computer technology talents who meet the needs of cross-domain e-commerce. With the rapid development of the e-commerce industry, the demand for talents with comprehensive skills has become increasingly prominent, especially for composite computer technology talents who master data analysis, artificial intelligence, marketing strategy and supply chain management. By constantly updating the curriculum system and integrating new technologies and theories,

educational institutions have cultivated high-quality computer technology professionals who can cope with various challenges in the e-commerce industry. At the same time, cooperation between universities and industry is increasingly important. Through close cooperation with e-commerce enterprises, educational institutions can not only provide students with the latest information of the industry, but also adjust the course content according to the actual needs of enterprises, ensuring that students can master the technology and knowledge required by the market. In addition, internship opportunities and project cooperation provided by enterprises provide practical platforms for students and promote the combination of theory and practice. Figure 1 below summarizes the role of educational background in promoting the development of cross-domain e-commerce:
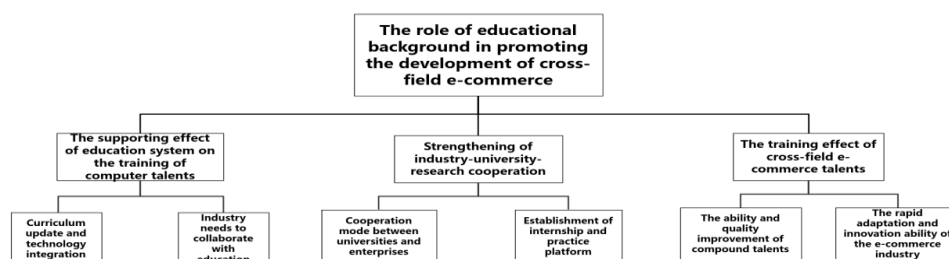

Figure 1. The role of educational background in promoting the development of cross-field e-commerce.

2.2. Supporting Role of Educational Background in Technological Innovation

Educational background plays a fundamental role in technological innovation, especially in promoting the development of cross-domain e-commerce. The computer science and technology education system provides a solid theoretical foundation and talent guarantee for technological innovation. By cultivating innovative professionals, education injects inexhaustible intellectual power into the continuous progress of technology. Technological innovation is inseparable from profound computer literacy and creative thinking, and the education system plays a decisive role in shaping these abilities. It not only teaches technical knowledge such as programming, data structures, and artificial intelligence but also pays more attention to cultivating critical thinking, problem-solving skills, and innovation awareness. This injects a dual impetus of thought and practice into technological development. In addition, the education system promotes technological innovation through research activities. Universities and research institutions promote technological breakthroughs through theoretical research and technological exploration in computer science. Educational background provides theoretical support for scientific research activities, enabling innovation results to be transformed into practical applications and promoting technological progress in the industry.

2.3. Education's Adaptability Training to the Demands of Cross-Field E-Commerce Industry

The education system plays an important role in adapting to the needs of the cross-cutting e-commerce industry. With the rapid development of the e-commerce industry, along with technological innovation and diversified market demands, the education system needs constant adjustment to train high-quality computer technology talents that meet industry requirements. Education should keep up with industry development, adjust course content, and integrate the latest technologies and concepts such as big data, artificial intelligence, and supply chain management to help students master practical skills. At the same time, it should focus on cultivating innovation ability and problem-solving ability to cope with industry changes and challenges. Cooperation with e-commerce enterprises has further enhanced the practicality and pertinence of education. By participating in curriculum development, providing hands-on training positions, and collaborating on projects, companies are helping educational institutions better understand

industry needs and ensuring that students gain important experience in real-world work scenarios. This cooperation model effectively promotes the close integration of educational content and industry needs, so that students can adapt more smoothly to the workplace environment. In addition, interdisciplinary training has also played a key role in adapting to the needs of the e-commerce industry. With the continuous development of cross-domain e-commerce, the knowledge structure of a single discipline is no longer enough to meet the complex needs of the industry. Through interdisciplinary curriculum design and integration of disciplines, the education system cultivates multidisciplinary professionals with solid computer technology skills and understanding of e-commerce market needs, marketing strategies, and management concepts to meet the urgent demand for diversified talents in the industry. Figure 2 below summarizes the education system's adaptation to the needs of the cross-domain e-commerce industry:

Figure 2. Education system's adaptability training to the demands of cross-domain e-commerce industry.

3. Application of Technological Innovation in Cross-Domain E-Commerce

3.1. Big Data Improves the Efficiency of Cross-Domain E-Commerce Precision Marketing

In cross-domain e-commerce, the use of big data has significantly increased the precision of marketing. Through the collection and analysis of a large number of consumer data, e-commerce platforms can deeply dig into user behavior patterns and consumption tendencies, so as to carry out personalized market promotion. Big data technology supports real-time data analysis, enabling e-commerce platforms to quickly capture potential business opportunities and develop personalized promotion plans according to the characteristics of different user groups. This not only optimizes resource allocation, but also improves conversion rates and ROI for marketing campaigns. Through big data analysis, e-commerce platforms can precisely target users, reduce ineffective marketing, enhance customer satisfaction and brand loyalty, and thus promote the growth of e-commerce business. Table 1 below summarizes the key role of big data in precision marketing:

Table 1. Key role of big data precision marketing.

Key areas	Function description
Consumer behavior analysis	In-depth exploration of user needs, optimize marketing strategies
Personalized recommendation	Increase user engagement and conversion
Advertising optimization	Precise advertising, improve the return on investment

As can be seen from Table 1, through big data technology, e-commerce platforms can gain insight into user behavior patterns, thereby optimizing marketing strategies and improving marketing precision. Personalized recommendations can increase user engagement, conversion rates, and enhance the customer experience. Advertising optimization

ensures accurate advertising, reduces waste of resources, and improves return on investment.

3.2. AI Optimizes the Prediction of Cross-Domain E-Commerce Consumer Behavior

In cross-domain e-commerce, artificial intelligence technology has demonstrated the ability to accurately predict consumer behavior patterns and demand trends. Using machine learning and deep learning algorithms, AI can extract underlying patterns from large amounts of user data and analyze data such as consumers' web browsing, shopping history, and search habits. These analysis results help e-commerce platforms predict the future needs of users, enabling personalized recommendations and precision marketing. AI also uses natural language processing (NLP) technology to analyze users' emotional feedback and comments, and employs image recognition technology to analyze visual content, making predictions more comprehensive and accurate. Through real-time updated consumer behavior models, e-commerce platforms can quickly adapt to market dynamics and accurately optimize products and services to enhance conversion rates and overall consumer satisfaction. Table 2 below summarizes the key role of AI in predicting consumer behavior:

Table 2. The key role of artificial intelligence in consumer behavior prediction.

Key areas	Function description
Data analysis	Extract potential patterns and demand changes from user behavior data
Personalized recommendation	Provide accurate recommendations based on user preferences to increase conversion rates
Sentiment analysis	Analyze user feedback, reviews and social media content to optimize marketing strategies

As can be seen from Table 2, artificial intelligence not only improves the accuracy of consumer behavior prediction, but also enhances the market adaptability and customer experience of e-commerce platforms.

3.3. Blockchain Enhances the Transparency and Security of Cross-Domain E-Commerce Supply Chain Management

The application of blockchain technology in cross-domain e-commerce, especially in supply chain management, can significantly enhance information transparency and data security. Through the decentralized and immutable characteristics of blockchain, e-commerce platforms can instantly monitor the entire process of goods from manufacturing to sales, ensuring that data at each stage is open, transparent, and securely accessible. This not only effectively reduces the possibility of counterfeiting and fraud, but also promotes the efficiency of supply chain operations. Blockchain technology also protects transaction information through encryption algorithms, ensuring data security during transmission and preventing data leakage and tampering at intermediate stages. In addition, the use of smart contracts also increases the level of automation in supply chain management, reduces human intervention, and improves operational efficiency and accuracy. Table 3 below summarizes the key role of blockchain in supply chain management:

Table 3. The key role of blockchain in supply chain management.

Key areas	Function description
transparency	Track product information in real time to ensure that every link of the supply chain can be traced
security	Encryption algorithms ensure the security of transaction information and prevent data tampering

| automate | Improve efficiency by automating supply chain execution with smart contracts |

As can be seen from Table 3, blockchain effectively improves the transparency, efficiency and security of supply chain management, and helps cross-domain e-commerce to improve the overall operation level.

4. Strategies for Education and Technological Innovation to Promote Cross-Domain E-Commerce

4.1. Build an Industry-University-Research Cooperation Platform to Promote the Integration of Edu-Cation and Technology

The establishment of an industry-university-research cooperation platform is of decisive significance for integrating education and technology, thereby advancing the development of cross-domain e-commerce. By strengthening the cooperation between enterprises, academic institutions and research institutions, the collaborative development of technological innovation and personnel training can be achieved. In the field of computer technology, close cooperation between educational institutions and the industry can help the academic community better understand the technical needs of the e-commerce industry, optimize course design, and cultivate computer technology composite talents who can cope with changes in the industry. In this process, technological innovation is jointly promoted by enterprises and research institutions, and academic research provides theoretical support and technological exploration for enterprises, especially technological breakthroughs in areas such as artificial intelligence, big data analysis, and cloud computing. The policy support ensures the capital investment and platform construction of cooperation. This synergy effectively frames the bridge between education and technology, and stimulates the technology application and industrial upgrading of the e-commerce industry. The education system can obtain industry data and application scenarios through cooperation with enterprises, providing a realistic basis for academic research. Conversely, enterprises can leverage cooperation with academic institutions to gain insights from academic research, inject practical elements, promote product innovation through joint development, and enhance market competitiveness. The government's policy support provides funds, platforms and legal guarantees, providing strong support for the deep integration of industry, university and research, thus promoting the wide application of computer technology in the field of e-commerce and industrial upgrading. In this strategic path, the effect of the integration of education and technology can be described by the following formula:

$$E = \alpha T + \beta R + \gamma P \tag{1}$$

Among them, E Represents the effect of the integration of education and technology, T Represents technological innovation, mainly driven by enterprises and research institutions, R Academic research, providing theoretical support for education and technology, P It is policy support, funds and policy guarantees from the government. The coefficients α, β and γ represent the contribution of each factor to the final effect. According to this formula, it can be seen that the synergy of technological innovation, academic research and policy support is the core driving force to promote the integration of education and technology in the e-commerce industry.

4.2. Promote Interdisciplinary Education and Cultivate Composite E-Commerce Talents

To promote interdisciplinary education and cultivate composite e-commerce talents, the core strategy is to break the boundaries between disciplines and realize the organic combination of multiple fields such as computer science, data analysis, marketing, logistics management, and law. In addition, educational institutions need to establish close links with industry and industry elites to jointly develop interdisciplinary teaching programmes that meet practical needs. Through cooperation, the course content can keep up

with industry trends and ensure that students master cutting-edge technology and industry information. By participating in the curriculum setting and providing practical training positions, enterprises can cultivate all-round talents to meet the actual business needs, alleviate the dilemma of talent shortage, and thus promote the innovation and progress in the field of e-commerce. The effect of interdisciplinary education can be expressed by the following formula:

$$C = \alpha(S + T) + \beta I \tag{2}$$

Among them, C Represents the effect of education, S Denotes the degree of integration of disciplines, T Is the ability to apply technology, I Cooperate on behalf of the industry. The coefficients α and β represent the impact of disciplinary convergence and industry collaboration on the final result. The formula reflects that interdisciplinary education relies on the integration of disciplines and the synergy of industry needs.

4.3. Strengthen Cooperation between Enterprises and Education to Enhance Technology Application Capabilities

Strengthening the cooperation between enterprises and educational institutions is an effective way to enhance the application of technology, especially in the field of computer technology. Enterprises can cooperate with educational institutions to jointly design course plans that meet the specific needs of the industry and ensure that the teaching content is synchronized with the development of industry technology. By embedding real cases and practical projects, students can deeply master and apply cutting-edge technologies, such as artificial intelligence, big data, blockchain, etc. In addition, companies can provide technical support and research resources to educational institutions to help better align the education system with industry needs. Through the feedback of the actual needs of enterprises, educational institutions can quickly adjust the course arrangement and cultivate more skilled talents that meet the needs of the market. The participation of enterprises in the teaching process and internship activities helps to select outstanding graduates with practical skills, thus increasing the motivation of enterprises to innovate. The effect of this cooperation can be expressed by the following formula:

$$A = \alpha C + \beta P + \gamma F \tag{3}$$

Among them, A Represents the improvement of technology application ability, C Represents the updating of course content and the integration of practice, P Participate in teaching and internship arrangements on behalf of enterprises, F Is corporate feedback and support, providing the latest industry technology and resources. The coefficients α, β and γ represent the degree of influence of each factor on the improvement of technical application ability. Through the deep cooperation between enterprises and education, the improvement of technology application ability helps students combine theoretical knowledge with practice, accelerates the pace of technological innovation, and optimizes the talent training mechanism, thus promoting the prosperity and development of the e-commerce field.

4.4. Provide Policy Support and Promote the Synergetic Development Mechanism

Policy support is an important guarantee for cooperation between enterprises and educational institutions, facilitating interdisciplinary computer technology innovation. The government should establish a legal system and provide financial support for the cooperation between enterprises and education. Through the establishment of special funds or innovation funds, enterprises and universities are encouraged to carry out joint research and development, technology application and personnel training in artificial intelligence, big data, cloud computing and other fields. At the same time, the government can also use tax relief policies to reduce the cost of enterprises and stimulate their investment enthusiasm in the field of education and technological innovation. It can promote the rapid development and application of computer technology, and promote the training of e-commerce related talents, providing a solid talent base for industry innovation and

technological progress. The synergies of this process can be expressed by the following formula:

$$S = \alpha F + \beta T + \gamma P \tag{4}$$

Among them, S Represents the effect of the synergetic development mechanism, F Is the policy financial support, including innovation funds and subsidies, T Represents technological innovation, new technologies developed in partnership with educational institutions, P Is the policy framework, the relevant policy measures introduced by the government. The coefficients α, β and γ represent the contribution degree of each factor to the collaborative development. Through policy framework and financial support, co-operation between enterprises and universities will be promoted to accelerate the transformation of technological innovation. Tax incentives reduce the burden on enterprises, encourage them to increase investment in education and technological innovation, and promote technological progress and talent training in the e-commerce industry.

5. Conclusion

With the vigorous development of cross-domain e-commerce, the synergy between educational background and technological innovation is becoming more and more significant, especially under the impetus of computer technology. Based on the education system, technological innovation and their interaction, this paper puts forward some strategies, such as building an industry-university-research cooperation platform, promoting interdisciplinary education, strengthening cooperation between enterprises and education and providing policy support. This not only promotes the training of computer technology talents in the e-commerce industry, but also promotes the rapid transformation of technological achievements and the upgrading of the industry.

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