Research on the change and development of international trade under the environment of electronic commerce

Jiaxia Han*, Weixi Zhu

School of Economic, Guangdong Ocean University, Zhanjiang, 524088, China *Corresponding author: 2272124391@qq.com

Abstract: This paper discusses the impact and transformation of cross-border e-commerce on the traditional international trade model. With the development of Internet technology and the acceleration of the globalization process, cross-border e-commerce, as an emerging mode of international trade, is having a profound impact on the traditional mode of international trade with its unique advantages and potential. This paper first outlines the characteristics and limitations of the traditional international trade model, and then analyses in detail the characteristics and impact of cross-border e-commerce, including its impact on the traditional trade market structure, trade processes and intermediary roles. Next, the paper discusses the transformation and adaptation of the traditional international trade model in the cross-border e-commerce environment, including the adjustment of enterprise business strategies, the updating of trade policies and legal systems, and the improvement of trade infrastructure. Finally, this paper specifically analyses the impact and transformation of cross-border e-commerce on the traditional international trade model through case studies, and summarizes the impact of cross-border e-commerce on the global trade pattern and the future development trend. The study presented in this article demonstrates how cross-border e-commerce is propelling the modernization and evolution of the conventional international trade model while encouraging the growth and innovation of international trade. Cross-border e-commerce is developing, but it also confronts a lot of obstacles. To maintain its healthy growth, governments, businesses, and international organizations must work together to set fair norms and regulations. In addition to being instructional for supporting the adaptation and transformation of the conventional international trade model, the study findings in this article provide vital reference value for understanding the development trend of cross-border e-commerce and its influence on international trade.

Keywords: Cross-border e-commerce; traditional international trade patterns; impact and transformation; market structure; trade processes

1. Introduction

In the context of globalization and the digital era, cross-border e-commerce, as an emerging mode of international trade, is making a profound impact and transformation on the traditional mode of international trade with its unique advantages and potential. This transformation not only affects the pattern and process of global trade, but also poses new challenges and requirements for enterprise business strategies and national policy formulation [1]. The traditional international trade model, with the country as the main body, relies on physical transport and complex trade processes, with high transaction costs and time costs. And the rise of cross-border e-commerce, with the development of Internet technology, breaks through the geographical and time constraints, making cross-border transactions of goods and services more convenient and faster [2]. This emerging trade mode, with its low-cost and high-efficiency features, is gradually changing the market structure and transaction process of traditional trade, and impacting the traditional international trade model.

However, the development of cross-border e-commerce is also facing many challenges, such as lagging laws and regulations, cybersecurity issues, and trade imbalances. These issues require the joint efforts of governments, enterprises and international organizations to establish a fairer and more open international trade environment by formulating reasonable policies and measures to ensure the healthy development of cross-border e-commerce [3]. The purpose of this paper is to explore the impact and transformation of cross-border e-commerce on the traditional international trade model, and to analyse its causes, characteristics and impacts, as well as how the traditional trade model can be adapted and

transformed [4]. By analysing relevant literature and cases, this paper hopes to provide certain references and insights for understanding the development trend of cross-border e-commerce and its impact on international trade.

2. Overview of traditional patterns of international trade

The traditional model of international trade has been the basis for economic interaction between countries since ancient times. Over time, this mode of trade has undergone an evolution from the initial exchange of goods to modern monetary transactions, resulting in a complex set of systems and processes. In this model, international trade relies primarily on various modes of transport, such as sea, air and land, to move goods from one country to another [5]. The parties to a trade usually sign a contract to determine the specific terms of the transaction, including price, quantity, quality standards, delivery time and payment methods.

The traditional model of international trade is characterised by a country-based approach that emphasises the importance of borders. Each country has its own tariff regime and trade policies, which are often influenced by national interests and political factors [6]. As a result, international trade is usually subject to complex customs clearance and inspection procedures, which not only increase transaction costs but also lengthen transaction time. In addition, international trade is subject to exchange rate risk and policy risk due to fluctuations in currency exchange rates and differences in the economic policies of different countries.

Although the traditional model of international trade plays an important role in the global economy, it has some limitations. First, this model relies on physical transport, and therefore transport costs can be very high for heavy and bulky goods. Second, cross-border trade usually involves going through multiple intermediaries, such as banks, insurance companies and logistics companies, and the cost of the services of these intermediaries can further increase transaction costs [7]. In addition, as international trade is subject to a wide range of laws and regulations, enterprises need to have the appropriate legal knowledge and expertise to conduct cross-border business, which is a greater challenge for SMEs.

With the development of globalization and the advancement of science and technology, the traditional mode of international trade is facing new challenges and changes. The rise of e-commerce makes crossborder transactions of goods and services more convenient and faster, thus impacting the traditional trade model [8]. At the same time, with the continuous improvement of international trade rules and the gradual reduction of trade barriers, the world economy is becoming more and more open and interconnected, which provides new opportunities for the transformation and upgrading of the traditional international trade model [9]. Against this background, understanding and grasping the fundamentals and characteristics of the traditional international trade model remains of great significance for enterprises and policymakers.

3. Characteristics and impact of cross-border e-commerce

Cross-border e-commerce is a new mode of international trade that has emerged with the development of Internet technology and the acceleration of the globalization process. Compared with traditional international trade, cross-border e-commerce has many unique features. Firstly, it breaks the geographical limitations, enabling consumers to purchase goods and services from all over the world directly through online platforms, while merchants can easily promote their products to the global market. (Figure 1 shows the distribution of global cross-border e-commerce). Secondly, cross-border e-commerce greatly simplifies the transaction process, making it faster and more convenient through online payments and electronic contracts [10]. In addition, cross-border e-commerce is also characterised by low cost and high efficiency, which lowers the threshold for SMEs to enter the international market and provides them with more business opportunities.

Cross-border e-commerce has had a far-reaching impact on the traditional mode of international trade. Firstly, it has changed the market structure of trade, enabling SMEs to participate directly in international competition and breaking the monopoly of large enterprises in traditional trade. Secondly, cross-border e-commerce has facilitated the globalization of trade [11]. Through the online platform, the trading of goods and services is no longer subject to geographical constraints, which has led to a closer link between markets around the world. In addition, cross-border e-commerce promotes innovation in trade methods, for example, through big data analysis and artificial intelligence technology, enterprises can more accurately predict market demand and formulate more effective marketing strategies.



Figure 1: The distribution of global cross-border e-commerce

However, the development of cross-border e-commerce has also brought about some challenges. Firstly, cross-border e-commerce faces complex legal risks due to differences in laws and regulations in different countries [12]. Second, cybersecurity is also an important issue that cross-border e-commerce needs to face: in recent years, the development of new e-commerce and new retail is in full swing, and many users shop through merchants' own e-commerce, third-party e-commerce, live e-commerce and other ways, resulting in massive shopping information, and the subsequent risk of data leakage is gradually increasing. After analysis, the main reasons for data leakage in the e-commerce industry include:

1, logistics link leakage; 2, the store operation "insider" leak; 3, Third-party tool software leaks.

In 2023, threat hunters captured nearly 940 data breaches related to the e-commerce industry(As shown in the figure 2) with more than 282,000 leaks, and the leaked data included many sensitive information such as customer names, mobile phone numbers, product information, order time, payment methods, and delivery addresses, involving well-known domestic and foreign brands such as cosmetics and clothing. The average global cost of a data breach will be \$4.45 million, an increase of 15% in three years.

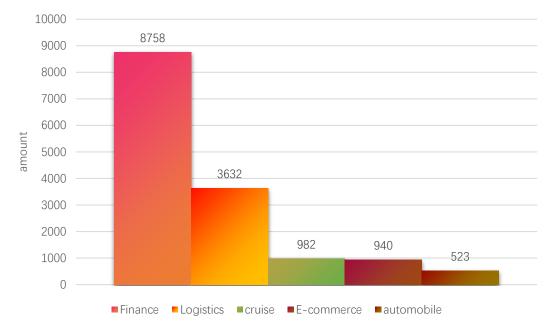


Figure 2: Top five industries by number of data breaches in 2023

In addition, cross-border e-commerce may exacerbate trade imbalance and impact on some traditional industries, leading to employment problems and social instability.

Overall, cross-border e-commerce, as an emerging mode of international trade, is having a profound impact on the global trade pattern with its unique characteristics and huge potential. With the continuous advancement of technology and the deepening of the globalization process, the development of cross-

border e-commerce will continue to drive change and innovation in international trade and inject new vitality into the growth and prosperity of the world economy. However, in order to give full play to the advantages of cross-border e-commerce and at the same time to meet the challenges it posed, it was necessary for Governments, enterprises and international organizations to work together to formulate reasonable policies and measures and to establish a fairer and more open international trade environment.

4. Impact of cross-border e-commerce on traditional international trade patterns

The rapid development of cross-border e-commerce has had a significant impact on the traditional form of international trade. The impact of factors such as market structure, trade procedures, and intermediary functions is most pronounced.

First of all, cross-border e-commerce has changed the market structure of traditional trade. Large multinationals tend to be in traditional international trade.

This makes it difficult for SMEs to enter foreign markets. Cross-border e-commerce is disrupting this trend, allowing SMEs to compete internationally and reach customers around the world using B2B proprietary platforms. As shown in the figure 3, the continuous upgrading of cross-border e-commerce will make the scale of China's cross-border export e-commerce self-operated platform continue to rise, which not only encourages market diversity, but also improves market competitiveness, in turn promotes trade liberalization and globalization, and completes the adjustment of the layout of the foreign trade industry chain at a deep level, so as to adapt to the complex and changeable competitive environment.

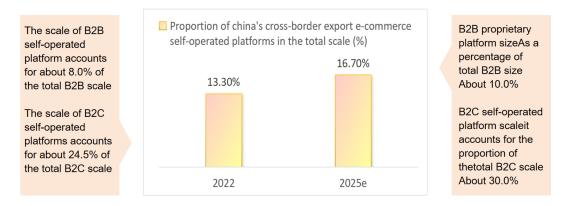


Figure 3: The proportion of the scale of China's cross-border export e-commerce self-operated platforms in the total scale in 2022&2025

Cross-border e-commerce has had an impact on the course of traditional trade. In the traditional model, international trade is usually involved:

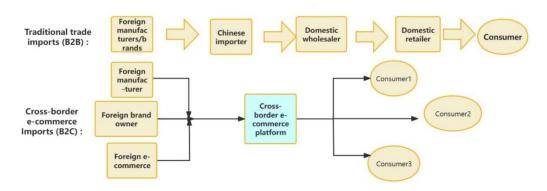


Figure 4: The overall difference between traditional trade and cross-border e-commerce imports

Including cargo transportation, customs clearance, inspection and many other links. In cross-border e-commerce, as shown in the figure 4, these processes are greatly simplified, and both parties can directly complete operations such as contract signing, payment and logistics tracking through the online platform, which greatly improves trade efficiency.

In addition, cross-border e-commerce has also promoted the innovation of trade payment methods, such as the emergence of new payment tools such as digital currencies and e-wallets, providing more convenience and choices for international trade.

Finally, cross-border e-commerce has had an impact on the role of intermediaries in traditional trade. In the traditional model, trade often needs to go through a series of intermediaries such as banks, insurance companies, logistics companies, etc., and the services of these intermediaries are usually charged. In cross-border e-commerce, many intermediary services can be provided directly through online platforms, such as online payment, electronic contracts, virtual logistics, etc., which not only reduces transaction costs, but also improves the transparency and security of transactions.

However, the impact of cross-border e-commerce on the traditional international trade model has also brought many challenges. For example, because the development speed of cross-border e-commerce far exceeds the speed of the formulation of relevant laws and regulations, it has led to some legal and regulatory gaps, increasing the number of cross-border e-commerce uncertainties and risks of environmental trading. In addition, the impact of cross-border e-commerce on traditional industries may also lead to some employment problems and social instability.

In general, cross-border e-commerce has had a profound impact on traditional international trade models, including changes in market structure, trade processes and intermediary roles, as well as challenges to laws and regulations and social employment. In the face of this shock, the traditional international trade model needs to be adjusted and reformed accordingly to adapt to the new trade environment and market demand. At the same time, governments and international organizations need to strengthen cooperation, improve relevant laws and regulations, ensure the healthy development of cross-border e-commerce, and promote fair and free global trade.

5. Transformation and adaptation of traditional international trade patterns

In the face of the rise of cross-border e-commerce and the impact on the traditional international trade model, the traditional trading system is undergoing a profound transformation and adaptation process. This transformation involves not only the adjustment of business strategies, but also the updating of trade policies and legal systems, as well as the improvement of trade infrastructure.

First of all, traditional trading enterprises are actively embracing e-commerce to adapt to the new market environment. Many businesses have started to build their own online sales platforms or partner with existing e-commerce platforms to reach consumers directly around the world. This not only improves the market competitiveness of the enterprise, but also broadens the sales channels of the enterprise. At the same time, enterprises are also actively adopting new technologies such as big data analysis, artificial intelligence, and blockchain to improve operational efficiency and reduce transaction costs. Through these measures, traditional trading companies are gradually transforming into more agile and responsive digital enterprises.

Second, governments and international organizations are updating their trade policies and legal systems to accommodate the development of cross-border e-commerce. This includes new e-commerce regulations, simplified customs procedures, and enhanced cybersecurity and consumer protection. For example, on January 25, 2019, the World Trade Organization (WTO) signed the Joint Declaration on Electronic Commerce, as shown in the figure 5. In addition, governments around the world are also working hard to crack down on illegal activities such as infringement of intellectual property rights and online fraud in cross-border e-commerce to maintain good market order.

Finally, the infrastructure of traditional trade is also constantly improving to accommodate the development of cross-border e-commerce. This includes building more efficient logistics systems, improving the speed and stability of communication networks, and developing new payment and settlement tools. These improvements not only help to reduce trade costs and increase transaction speed, but also provide a solid foundation for the development of cross-border e-commerce.

In the face of the challenges of cross-border e-commerce, the traditional international trade model is undergoing a comprehensive transformation and adaptation process. This transformation requires not only the active participation and innovation of enterprises, but also the support and guidance of governments and international organizations. Through these efforts, the traditional international trade model is expected to rejuvenate in the context of the new era and make greater contributions to the growth and prosperity of the global economy.

<text><text><text><text><text><text><text><text><text><text>

Figure 5: Joint Statement on Electronic Commerce Signed by 76 WTO Members

6. Impact of cross-border e-commerce on traditional international trade patterns

When exploring the impact and transformation of cross-border e-commerce on the traditional international trade model, the case study is to help us have a deeper understanding an effective way to have a concrete impact on this phenomenon. The following is a case study of the cross-border e-commerce platform Tmall Global to analyze the process and trend of China's international trade model change.

Tmall Global is Alibaba's import retail platform, dedicated to providing Chinese consumers with global imported goods and direct access to overseas lifestyles, as well as the preferred platform for overseas brands to directly reach Chinese consumers and build brand awareness and consumer insights. Since its launch in 2014, the cross-border e-commerce platform Tmall Global has become an important bridge between Chinese consumers and global brands. Tmall Global's success lies in its unique business model and technological innovation, which has had a significant impact on the traditional international trade model, and can also be a good indication of the transformation and development of China's international trade model.

On March 21, 2019, Tmall Global released three key strategies for 2019 at the Global Merchant Conference: upgrading the direct business and forming a "two-wheel drive" model together with the platform business to empower global brands; Create a new model of direct purchase from overseas warehouses, and build a global supply chain network for overseas "small and beautiful" brands; Cooperate with Taobao Live, Weibo, Xiaohongshu and other channels to expand content reach channels, establish a talent mechanism with multiple institutions, and create a content-based marketing position for global brands. These three strategies have effectively accelerated the transformation of China's international trade model, and the cross-border e-commerce industry has begun to accelerate its upgrading.

Tmall Global has broken the geographical and time constraints of traditional trade, allowing global brands to directly enter the Chinese market without having to go through a complex import process and high intermediary fees. This not only reduces the cost of trade, but also speeds up the flow of goods from production to consumption.

Tmall Global uses big data and artificial intelligence technology to provide consumers with a personalized shopping experience, while helping merchants accurately locate target markets and consumer groups. This data-based trading model improves the efficiency and effectiveness of transactions.

Tmall Global solves the logistics and payment challenges in cross-border e-commerce by establishing a comprehensive logistics and payment system. For example, Tmall Global has created a new model of direct purchase from overseas warehouses, cooperated with a number of international logistics companies, and established a global logistics network to ensure that goods can be delivered to consumers quickly and safely.

Tmall Global also supports a variety of payment methods, including international credit cards and Chinese Alipay, to provide consumers with a convenient payment experience. Through these innovations and reforms, Tmall Global not only promotes Chinese consumers' consumption of global brands, but also provides an effective channel for global brands to enter the Chinese market, forming a simple and effective transaction chain. The traditional foreign trade transaction chain is very long, basically composed of five rings, domestic manufacturers, domestic traders, foreign distributors, foreign retailers, and end consumers. However, Tmall Global's transaction chain has only three rings, foreign brand direct stores, overseas warehouses, and end consumers. There are multiple advantages to a short transaction chain, the most important of which is reflected in profits, Tmall Global allows foreign brands to directly face the end consumer and get the most lucrative retail link in the transaction link. This cross-border trade model based on e-commerce platforms has had a profound impact on the traditional international trade model and promoted the transformation and upgrading of the trade model.

Overall, the case of Tmall Global shows that cross-border e-commerce not only reduces trade costs and improves trade efficiency through technological innovation and business model innovation, but also creates more value for consumers and merchants. This is an important enlightenment for the impact and transformation of the traditional international trade model. With the advancement of science and technology and the deepening of globalization, we have reason to believe that cross-border e-commerce will continue to promote the development and transformation of international trade.

7. Discussion

7.1 Discussion of cross-border e-commerce at this stage based on three dimensions

The impact and transformation of cross-border e-commerce on traditional international trade is indeed a complex and multi-dimensional phenomenon. Its impact and transformation has been remarkable on three dimensions, individual, social and national.

Personal dimension:

Consumer choice and convenience: Cross-border e-commerce platforms expand the range of consumer choice and improve convenience.

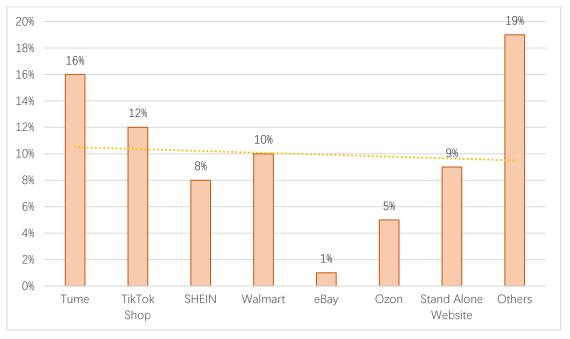


Figure 6: 2023 Mature sellers develop new channel distribution

Price competition and price transparency: cross-border e-commerce has brought greater price transparency, and sellers can freely compare the suitability of various cross-border e-commerce platforms and sold products. Therefore, in addition to Amazon channels, new sales channels such as Temu, TikTok Shop, Walmart e-commerce and SHEIN third-party platforms have become the focus of seller layout, as shown in the figure 6. Buyers can also easily compare the prices of goods in different countries or

different websites, thus enjoying more competitive prices.

Cultural exchanges and product experience: Through cross-border e-commerce, individuals are exposed to products and cultures from all over the world. Such cultural exchanges promote individuals' understanding and respect for different cultures, and enrich consumers' product experience.

Social dimension:

Employment and economic growth: Cross-border e-commerce has contributed to the growth of global trade, driving employment in related industries such as logistics, e-payments and customer service.

Resource utilization and environmental impact: Although cross-border e-commerce has improved convenience, rapidly growing demand has led to more logistics transportation and packaging material use, which can have a negative impact on the environment. Society needs to take measures to reduce packaging waste and carbon emissions to reduce its impact on the environment.

Digital divide and information security: The development of cross-border e-commerce has also highlighted the existence of digital divide, and people in some regions may not enjoy the convenience brought by the Internet. At the same time, personal information security has also become a focus of social attention, the society needs to strengthen the protection of personal information and network security construction.

Country dimension:

International trade policy and competitiveness: Cross-border e-commerce poses new challenges to national trade policies, and corresponding policies need to be formulated to cope with the development of e-commerce. At the same time, cross-border e-commerce also provides more trade opportunities for the country and enhances the country's international competitiveness.

Taxation and regulation: The state needs to formulate corresponding tax policies to regulate the tax behavior of cross-border e-commerce, so as to ensure the fairness and rationality of taxation. For example, China's cross-border e-commerce retail import policy has been liberalized, reducing tariffs and taxes on cross-border e-commerce imports.

International cooperation and cultural exchanges: Cross-border e-commerce promotes international cooperation and cultural exchanges, and countries can share their products and cultures through e-commerce platforms, which promotes international friendly relations and mutually beneficial cooperation. The impact and transformation of cross-border e-commerce on the traditional international trade model is a multifaceted and multilevel phenomenon. It brings development opportunities as well as challenges and problems. Therefore, we need to consider it comprehensively from multiple perspectives in order to promote the healthy development of cross-border e-commerce and achieve a win-win situation in international trade.

7.2 A discussion on the future development of cross-border e-commerce based on four dimensions

In this paper, we explore the impact and transformation of cross-border e-commerce on the traditional international trade model, analysing its impact and the transformation process. However, the development of cross-border e-commerce and international trade is a process of continuous change, facing the emergence of new technologies, new markets and new challenges. Therefore, future research needs to explore the following aspects in depth:

Future research needs to focus on the impact of new technologies on cross-border e-commerce and traditional international trade models. With the development of new technologies such as artificial intelligence, blockchain, and the Internet of Things, the operation mode and trade process of cross-border e-commerce may undergo fundamental changes. Studying how these technologies affect the efficiency, security and transparency of international trade will help businesses and governments develop more effective strategies and policies.

Future research needs to explore the differences in the development of cross-border e-commerce in different countries and regions. Due to different levels of economic development, cultural backgrounds, laws and regulations, and other factors, cross-border e-commerce has developed differently and faced different challenges in different countries and regions. An in-depth study of these differences will help to better understand the changes in the global trade landscape and provide customized development recommendations for different countries and regions.

Future research needs to focus on the broader socio-economic impacts of cross-border e-commerce.

Cross-border e-commerce not only affects trade patterns, but also has an impact on employment, income distribution, consumer behaviour and other aspects. Studying these impacts will help assess the socioeconomic effects of cross-border e-commerce more comprehensively and provide more basis for policy formulation.

Future research needs to focus on the sustainable development of cross-border e-commerce. With the increasing global emphasis on environmental protection and social responsibility, the development of cross-border e-commerce also needs to consider its impact on the environment and its responsibility to society. Studying how to realize the green development and social responsibility of cross-border e-commerce will be an important direction for future research.

Future research needs to explore in-depth in terms of technological innovation, regional differences, socio-economic impacts and sustainable development in order to better understand and respond to the impact and transformation of cross-border e-commerce on the traditional international trade model. This will be of great significance in promoting the healthy development of global trade and building a fairer, more open and greener international trade system.

8. Conclusion

Through the study of the impact and transformation of cross-border e-commerce on the traditional international trade model, we can draw relevant conclusions. Firstly, cross-border e-commerce has become an important part of global trade, which makes the global market more closely linked by breaking the limitations of geography and time. Cross-border e-commerce not only provides consumers with more choices of goods and a convenient shopping experience, but also opens the door to international markets for SMEs and promotes the globalization and liberalization of trade.

Secondly, cross-border e-commerce has had a profound impact on the traditional international trade model. It has changed the market structure of trade and increased the degree of competition in the market; simplified the trade process and improved the efficiency of trade; and had an impact on the intermediary role in traditional trade, reducing transaction costs. These changes have forced the traditional trade model to be adjusted and reformed to adapt to the new trade environment.

At the same time, the development of cross-border e-commerce has brought about a number of challenges, including lagging laws and regulations, cybersecurity issues, and trade imbalances. These challenges require the joint efforts of governments, enterprises and international organizations to establish a fairer and more open international trade environment through the formulation of reasonable policies and measures to ensure the healthy development of cross-border e-commerce.

Overall, cross-border e-commerce is driving the transformation and upgrading of the traditional international trade model and promoting the development and innovation of global trade. With the continuous advancement of technology and the deepening of the globalization process, we have reasons to believe that cross-border e-commerce will continue to make significant contributions to the growth and prosperity of the world economy. Understanding and grasping the characteristics and impact of cross-border e-commerce is therefore of great significance to enterprises and policymakers.

References

[1] Wang, P. (2018). On the development of cross-border E-commerce and the transformation of foreign trade model. Modern Economy, 9(10), 1665-1671.

[2] Wang, Y., Lee, S. H. (2017). The effect of cross-border e-commerce on China's international trade: An empirical study based on transaction cost analysis. Sustainability, 9(11), 2028.

[3] Wang, L. (2020). The impact of cross-border e-commerce development on China's international trade and economic development. International Journal of New Developments in Education, 2(6).

[4] Zhong, H., Zhang, S., Song, W., & Zhang, Z. (2021). Impact of international trade on cross-border e-commerce development: an empirical study based on the evidence from Ningbo city in China. International Journal of Technology, Policy and Management, 21(2), 140-156.

[5] Tang, X. (2021, August). Research on the development of computer cross border e-commerce from the perspective of international trade. In Journal of Physics: Conference Series (Vol. 1992, No. 2, p. 022060). IOP Publishing.

[6] Ma, S., Guo, X., & Zhang, H. (2021). New driving force for China's import growth: Assessing the role of cross-border e-commerce. The World Economy, 44(12), 3674-3706.

[7] He, Y., & WANG, J. (2019). A panel analysis on the cross border e-commerce trade: Evidence from ASEAN countries. The Journal of Asian Finance, Economics and Business, 6(2), 95-104.

[8] Qu, X. (2020, November). Research on the Development of Cross-Border E-commerce in the Context of Digital Trade. In 2020 2nd International Conference on Economic Management and Cultural Industry (ICEMCI 2020) (pp. 380-383). Atlantis Press.

[9] Zhao, M. X. (2021). Transformation and upgrading strategies of foreign trade enterprises based on cross-border E-commerce. International Journal of Education and Teaching Research, 2(4), 1-7.

[10] Yang, L., Dong, J., & Yang, W. (2024). Analysis of Regional Competitiveness of China's Cross-Border E-Commerce. Sustainability, 16(3), 1007.

[11] Gomez-Herrera, E., Martens, B., & Turlea, G. (2014). The drivers and impediments for crossborder e-commerce in the EU. Information Economics and Policy, 28, 83-96.

[12] Ni, W. (2022). Online and offline integration development of Yiwu cross-border e-commerce in digital economy era. Procedia Computer Science, 202, 307-312.