Research on the Teaching Reform of Cross-Border E-Commerce Courses in Higher Vocational Universities under the Background of the Digital Era

Lingzhao Deng and Xi Pei*

Faculty of Cross-Border E-Commerce, Shenzhen Polytechnic, Shenzhen, China;
Email: denglingzhao@szpu.edu.cn (L.D.)
*Correspondence: peixi@szpu.edu.cn (X.P.)

Abstract—In 2022, China's total import and export of cross-border e-commerce reached 2 trillion Yuan for the first time, accounting for 4.9% of the country's total import and export trade. With the booming development of cross-border e-commerce industry, the demand for cross-border e-commerce talents is increasing, and with the implementation of China's going out and double-cycle strategy policy, higher vocational colleges and universities, as the main force of cross-border e-commerce talent cultivation, have carried out cross-border e-commerce courses based on the needs of the industry and have gradually become the important core courses for the majors of International Business, International Economics and Trade and Cross-Border E-commerce. Cross-Border e-commerce course as an emerging course, coincides with the full arrival of the digital economy era, AI and 5G technology are advancing rapidly, and how to cultivate applied high-quality cross-border e-commerce talents in the rapid development of information technology at the same time, is the challenge faced by each institution. Starting from the background of the era of comprehensive development of the digital economy, this paper analyzes the mission of the current cross-border e-commerce course system, analyzes the predicament faced, and explores the development principles and implementation path of course reform, which has important theoretical and practical value.

Keywords—vocational education, digital economy, cross-border e-commerce, teaching reforms

I. INTRODUCTION

On 12 December 2021, the State Council issued the "14th Five-Year Plan for the Development of the Digital Economy" ("The Plan"), stating that during the "14th Five-Year Plan" period, China's digital economy will shift to a new phase of deepening application, standardized development, and universal sharing. The digital economy is the main economic form after the agricultural and industrial economies, and it is a new economic form with data resources as the key element, modern information network as the main carrier, and the integration and application of information and communication technology and the digital transformation of all elements as the important driving force. It promotes more unity of fairness and efficiency [1]. The digital economy, with its unprecedented speed of development, wide scope of radiation, and profound impact, is driving profound changes in the modes of production, living, and governance. It has become a key force in reorganizing global factor resources, reshaping the structure of the global economy, and changing the pattern of global competition [2, 3]. As an important part of the digital economy, the key elements of digital talent have a pivotal impact on the collaborative innovation and development of the economy in the new era. Countries are scrambling to seize the development highland of the digital economy, and the rapid cultivation and reserve of digital talents are regarded as strategic planning, which will affect the situation and pattern of future international development [4, 5]. Currently, the challenges faced by higher vocational colleges and universities include: realizing the multidimensional cultivation and development of digital economy talents, cultivating high-quality technical and skilled talents, skilled craftsmen, and master craftsmen, and better serving the construction of a strong manufacturing country and digital China [6].

In 2022, China's total import and export of cross-border e-commerce reached 2 trillion Yuan for the first time, up 2.1 trillion Yuan, a year-on-year increase of 7.1%, and its amount accounted for 4.9% of China's total import and export of trade in goods, according to customs data. As of June 2023, China's total import and export of cross-border e-commerce reached RMB 1.1 trillion, up 16% from last year. Among them, exports amounted to RMB 821 billion, up 19.9%, and imports amounted to RMB 276 billion, up 5.7% [6–8]. The demand for cross-border e-commerce talents is also increasing day by day. With the implementation of China's policy of going out and double-cycle strategy, higher vocational colleges and universities, as the main force of cross-border e-commerce talent training, have carried out cross-border e-

commerce courses according to the industrial demand. They have gradually become important core courses for the majors of International Business, International Economics and Trade, as well as cross-border e-commerce [8]. According to the latest data released by Jinpingguo of China Science and Education Evaluation Network in 2023, the number of schools conducting cross-border e-commerce majors has reached 325, which on the one hand reflects China's determination to develop digital trade and carry out talent cultivation, and on the other hand also confirms the broad market demand [9, 10]. In such an environment, with the comprehensive development of the digital economy, it is an inevitable trend for schools to cultivate applied international talents who are adapting to the era of the digital economy and the development of the market [11]. Teaching in higher education institutions, especially vocational colleges, should be guided by scientific values and concepts, embedding digital multidimensional thinking skills in the training process. It also should be guided in improving the teaching level of teachers, consolidating teaching content and resources, and creating precise internship and practice opportunities. This is to enable students to master new forms of cross-border e-commerce theories and practical skills so that they can adapt to the new trends of cutting-edge industries in the era of the digital economy [11, 12].

II. CROSS-BORDER E-COMMERCE TALENT TRAINING IN THE DIGITAL ECONOMY ERA

The cross-border e-commerce course in higher vocational colleges and universities is a highly applied business course that enables students to master the theory, knowledge, and skills of business marketing in the international markets. To cultivate all-round talents in cross-border e-commerce that are more in line with the era of the digital economy, it is not only necessary to make a good design from the level of talent cultivation program and professional construction, but also need to strengthen the foundation from the micro level of curriculum reform. The training objectives of cross-border e-commerce curriculum reform include the following aspects.

A. To Have a Broader Body of Knowledge in Reserve

Cross-border e-commerce in the digital economy era looks at the new models of marketing systems with digitalization of trade, popularization of artificial intelligence, and big data cloud computing systems. Coursework is centered on the needs of foreign customers and involves the learning of knowledge and skills in various aspects such as cross-cultural, multi-language, and multi-time differences. Students not only need to reserve the operation skills of traditional cross-border e-commerce platforms such as Amazon and Shrimp but also need to learn such technology-related knowledge as new media marketing, short-video operation and promotion, big data analytics, digital twins, and virtual digital people. Students must be flexible and integrated to carry out cross-border e-commerce activities through

digital technologies. For example, the offline B2B business of traditional international trade is transformed into B2C business on cross-border e-commerce platform enabling manufacturing industry and brands to go overseas. China strongly supports the development of cross-border e-commerce and has a special code for cross-border e-commerce, the 9710 customs supervision mode. The new policies and business models require students to have a broader knowledge base. In addition, laws and regulations are also issues that students need to pay attention to. Many enterprises, even with huge business volumes, still do not develop standardized intellectual property literacy and often face significant economic losses after infringement or sanctioning, so it is important to include compliance knowledge training and the latest laws and regulations on cross-border e-commerce in major markets in the course modules.

B. To Have more Focused Expertise

In addition to stockpiling new knowledge, the development of applied talents should also be equipped with specialized skills to carry out international marketing activities. Through classroom practice, students are able to obtain specific intelligence about the target market through a variety of information channels, determine the labels of potential user groups, and scientifically develop implementation steps for marketing. They can utilize social media, live streaming platforms, and all kinds of information streaming media to promote products, increase brand exposure, and flexibly use the funnel model to achieve user conversions to increase the effectiveness of their international marketing. This requires students to be familiar with the characteristics of global new media platforms, understand the consumption habits of users on different new media platforms, and develop implementable global marketing strategies. Therefore, in addition to basic marketing professional skills, students should also have professional skills related to digital media technology marketing. The traditional position in cross-border e-commerce is cross-border e-commerce operation, in the past, the employees in this position were only required to upload materials, test data, and correct the LISTING pages in accordance with the management requirements, etc. However, now that we have entered the era of big data, the selection of products and shelves are very often not operated manually, but the conclusion is drawn from AI data analysis, so the company will be investing more resources into the development team rather than expanding the operation team indefinitely. I have researched the leading cross-border e-commerce enterprises in Shenzhen, the number of people in the entire operation team is in a state of shrinkage, the reason is that the current position is more in need of biased algorithmic engineers class of talent, although the cost of wages for a single position is higher, the team efficiency is more often high, so our students' professional skills training to pay attention to the position and the feedback of the manpower market, in-depth research and maintain real-time communication to ensure that the professional skills of the students cultivated by the market. To ensure that the professional

skills of the students are required by the market, we need to conduct in-depth research and maintain real-time communication with enterprises.

C. To Have a Comprehensive Literacy that Is Adapted to the Development of Society

Based on the cultivation of scientific and healthy values, the talents to be cultivated should adapt to the new occupations bred in the era of the digital economy, in which new media marketers, big data analysts, artificial intelligence and AI designers, etc., which are already widely employed, are all equipped with the labels of the digital economy. Industry synergy and innovation have benefited from the rapid development of the digital economy in recent years, and the fact that the resulting demand for talent has been upgraded is also obvious. Not only new occupations but also traditional occupations are facing a wave of digital transformation, which also puts high demands on the digital upgrading of traditional positions. Comprehensive literacy is the most in-demand literacy skill in the workplace. Colleges and universities cannot ensure that the graduates they produce fully meet the needs of real-world skills, because there is always a lag time from new technology to popularization to collation into classrooms and teaching materials, and the learning and growth of students in the work process directly determines the height of their short-term careers in the next three to five years. Therefore, how to train students to grow rapidly in the work process is a problem that colleges and universities need to solve. The workplace is not like a school, in the process of growing up in the big waves, only by maintaining sufficient learning energy, lofty career goals, good anti-pressure mentality, positive summary thinking, good interpersonal relationships, and rational value judgment, society will give newcomers the opportunity to grow. Therefore, the "high-level" talents cultivated by higher vocational colleges and universities should not only have professional knowledge and skills to adapt to the era of the digital economy but also become composite talents with higher comprehensive quality, not only adapting to the requirements of new positions but also being able to undertake the rapid transformation of traditional positions.

III. THE PREDICAMENT: A REVIEW OF THE PROBLEMS OF CROSS-BORDER E-COMMERCE CURRICULUM SYSTEM IN HIGHER VOCATIONAL COLLEGES AND UNIVERSITIES

In the post-epidemic era, the entire international market is characterized by internationality, cyclicality, and complexity. According to the data released by the General Administration of Customs, in the first half of 2022, China's trade volume with major trading partners grew faster, with import and export to the United States, the European Union and ASEAN growing by 11.7%, 7.5% and 10.6% respectively, and the import and export to countries along the "Belt and Road" growing by 17.8%. Due to the change in people's activity habits, the cross-border e-commerce industry has emerged and grown, and the demand for overseas online marketing professionals has further increased. Vocational colleges and universities, as the highland of applied cross-border e-commerce talent training, need to keep pace with the times and upgrade their curriculum and training mode. At present, the cross-border e-commerce curriculum system of higher vocational colleges and universities mainly has the following problems:

A. Project-Based Classroom Reform Is a Formality

Cross-border e-commerce course project-based course reform has been carried out and implemented in many institutions, but it is not difficult to find that even though it is claimed that the teaching content has been reconstructed and project-based reform has been carried out, only the title has been changed from the noun knowledge content to the verb phrase, and has not gone through the all-round project design. Throughout the current textbooks and courses of cross-border e-commerce courses in higher vocational colleges and universities, most of them are still based on the knowledge learning of traditional e-commerce platforms, international trade, and the theoretical content of multinational company marketing. In the actual market environment, the impact of information dissemination efficiency on the marketing approach is huge, and if the traditional theoretical system is still used when the cross-border e-commerce platform is already fully online, it will cause a serious disconnect between theory and practice. Of course, it is difficult to complete the content reconstruction and project-based reform overnight, but teachers should get rid of the constraints of the previous course framework when building new courses, plan the course objectives, and design the course syllabus according to the latest market positions and workflows, and avoid the spread of formalism. Of course, this needs to be accomplished with the cooperation of the industrial level, which puts forward new demands on the depth and breadth of the integration of industry and education.

B. School-Enterprise Co-operation "Two Skin"

Although many schools have set up a pool of expert teachers, including on-campus and off-campus tutors, the quality of the programs and teaching results are not satisfactory. External tutors can bring first-hand information and practical skills from enterprises, but the effectiveness of classroom expression and teaching methods often need to be improved. Moreover, due to the heavy work pressure, external tutors are often enthusiastic and active in the "name", but lack sustained motivation in the subsequent "teaching" work, which does not achieve the effect planned at the beginning. Teachers may also face structural imbalance, e.g., when inviting external tutors to the courses, they would like to invite experts with high positions and rich experience, but these tutors have large workloads and can only take up limited teaching workloads in reality; some enterprise tutors have rich experience in practical exercises, but they lack pedagogy, and the quality of the classroom teaching process organized by them needs to be improved. In addition, the curriculum resources of enterprise tutors need to be integrated with those of full-time teachers throughout, and the way of interaction with students

needs to be improved and extended to create integrated and diversified rich teaching resources.

C. Lack of Practical Opportunities

Students do not have sufficient opportunities for practice in cross-border e-commerce programs. Although the number of e-commerce enterprises is relatively large, most of them are small and micro-enterprises, which can only afford a limited number of practical positions for students. Micro and small enterprises are very strict about cost control and would rather "use" talents than "train" them. Small and micro enterprises are unable to provide enough training positions, while the number of large enterprises is limited, so how to protect the cost of co-operative enterprises and meet the capacity of practical teaching positions is a difficult balance. Cross-border e-commerce, especially overseas market promotion, requires real input costs, and the capacity of a large student group and limited practical training positions is limited, and small and micro enterprises are more sensitive to cost tolerance and cannot accept the cost loss caused by student practice. Cross-border e-commerce is a core position of advertising, which belongs to the "cost" of the position, so it directly determines the input-output ratio of the enterprise project, this position requires a lot of hands-on experience, if you can not carry out effective investment flow, the enterprise will face huge economic losses. Therefore, the expansion of cross-border e-commerce precision practice positions is a major challenge.

D. Lack of International Perspective

It is important for cross-border e-commerce courses to develop a global perspective in students. Drucker's business theory on globalization vision has three important parts, to have the ability to envision the environment in which the organization is located, including structure, market customers, technology, and so on. At the current stage of the curriculum, in the process of cultivating students' globalization vision in the era of the digital economy, it is difficult for higher vocational colleges and universities to achieve systematic cultivation due to different geographic factors, foreign language levels, and learning bases, although now the big data information flow can be personalized to push international news information that students are interested in, it is not easy to achieve effective learning and integration, and the personalized differences of students have a great impact on the learning effect. In particular, the market users of cross-border e-commerce are distributed globally, and there is a relative lack of research opportunities in foreign markets, where the users' feelings about vision, product preferences, price sensitivity, and after-sales requirements are very different from those in the domestic market. Incorporating an international perspective into classroom teaching requires teachers to have sufficient knowledge reserves and even overseas study and exchange experience, and sufficient contact with local operation teams, to satisfy the curriculum's need to fit into the ever-changing international market environment.

IV. DEVELOPMENT: A FEW BASIC PRINCIPLES APPLICABLE TO CROSS-BORDER E-COMMERCE CURRICULUM REFORMS

Under the premise of building a modern vocational education system, the Ministry of Education has put forward new and higher requirements for the construction of cross-border e-commerce and other curriculum systems. Vocational education is very different from theoretical research-based education, and we should follow the basic concept of applied vocational education to improve the construction of the curriculum system. Cross-border e-commerce belongs to the core courses of international business, e-commerce, and other majors, and the basic development principle of "three adherence" should be clarified in the process of reforming the curriculum construction:

A. Adherence to the Principle of Echoing the Basic and Core Curricula

TABLE I. CROSS-BORDER E-COMMERCE PREREQUISITE KNOWLEDGE AND SKILL RESERVES

Name of the basic course	Cross-border e-commerce course knowledge base	Cross-border e-commerce course skills reserve
Ethics and the rule of law	Basic Laws and Regulations and Values	Demonstrating National Confidence and Leading Brands to Go to Sea
Maths	Mathematical analysis and statistics	Data analysis using analytical software
Fundamentals of Economics	fundamental economic law	Domestic and international micro and macro market judgments
Computer basis	AI foundation	Working with AI tools
English (language)	Enough vocabulary	Working in an English-speaking environment

The Cross-border e-commerce course, as a professional core course with strong practicality and extensive knowledge, is an important and difficult content for sophomore and junior students to learn. Before starting the study, students need to complete the study of basic courses, and not only need to build a good foundation in general education courses, such as learning mathematics, English, basic economics, and other courses, so that students have a sufficient foundation for learning and cognitive literacy before the study of professional courses. Which to do the Civics and Politics first, Arts and Science and progress. For example, the Civics and Politics course should be combined with the current background and effectively integrated into the classroom according to the student's study plan, not only reviewing the classic stories of history, but also guiding the students to accept and absorb the scientific development perspective; for language, law and other basic courses in the liberal arts, it is necessary to integrate into the modular curriculum system, and structured cultivation of the future professional development of the students; for the basic courses in the science disciplines such as maths, physics and other basic courses, first of all, we need to cultivate students' hobbies and interests in researching the subjects. For basic science courses such as

mathematics and physics, first of all, we should cultivate students' hobby and interest in the study, lay a solid foundation for learning, and achieve a sense of achievement in the project. In addition, in the era of the digital economy, the application of basic computer programming tools such as Python and big data analysis should be consolidated as basic knowledge. The details are shown in Table I.

B. Adherence to the Principle that Professional Programs Should Be Oriented toward Vocational Positions

Cross-border e-commerce course content and teaching arrangements should be job-oriented. The course content should run through the two features of internationality and digitalization. Internationality needs to let students have a global perspective, on the one hand, to provide a wide range of international cases and international policy analysis of the latest forms, to keep the information at home and abroad synchronous, the skills training received by the students is the real situation of the current international market, and to avoid the unreasonable phenomenon of closed-door, book to book reading; on the other hand, it is necessary to combine with the background of the era of the digital economy, that is, the digital industrialization and the digitalization of industry development trend, through the analysis of the currently popular digital economy elements, to establish a clear knowledge and skills literacy goals, strengthen the guidance and interaction of off-campus tutors to students, and establish a perfect school-enterprise teaching evaluation system, to achieve the learning to use, knowledge and action. Digital transformation is the inevitable process of modern vocational positions, and those who cannot adapt to the digital era fear that it will be difficult to make great progress in modern society with advanced information technology.

C. Adhere to the Principle of Seamless Integration of Civic Education

In training students to integrate Civic and Political Education into the curriculum content in the process of learning and practice, it is necessary to realize the organic combination with the project-based reform and avoid hard implantation and transportation. Civics and politics in the classroom is not just a slogan, it is a comprehensive reform of China's education system to cultivate students' patriotism and love for the party, courage, pioneering, and innovative spirit. Young students shoulder the mission of the future prosperity and development of the motherland and need to grow up comprehensively in terms of morality, intelligence, physical fitness, and aesthetics. Teachers should integrate the spiritual genealogy of the Chinese Communist Party into the course content when reconstructing the course content, especially through the project-based curriculum reform so that students can experience national self-confidence in the process of real hands-on practice, and allow students to have an emotional experience and spiritual resonance, the teacher abandoned the traditional teaching mode of a full classroom. In the teaching process, the students

deeply participate and share their speeches, the teacher focuses on guidance and knowledge condensation and is innovative in the assessment method, and the teacher comprehensively evaluates the effect of the project and ideology.

D. Adhere to the Principle of Results-Oriented Training

The teaching effect of the course should be demonstrated through a series of results. The traditional classroom usually verifies the effect of students' learning through exams, which is not a result-oriented idea, but a test-taking idea. Results-oriented advocate students in real activities or projects to complete their work tasks, while learning knowledge to master the skills, and ultimately through the results of the work to evaluate the learning effect, focusing on the "do middle school" course ideas, rather than "not assessed theory". This echoes the principle of project-based reform when students can better learn basic theoretical knowledge, and at the same time under the guidance of the teacher to carry out the project, the team division of labor. For a cross-border e-commerce course, the outcome can be a report, an article, a video, or a business manual. It can also be a presentation copy, performance in a digital sandbox simulation system, sales in a social e-commerce network, or an award in a skills competition. We do not limit the form of the results too much, as long as the students are personally involved in the results of work related to knowledge and skills, which can be used as part of the assessment. The new classroom, created through the principle of results orientation, has seen a significant reduction in student engagement and forgetfulness.

V. PROMOTING: THE REFORM PATH OF CROSS-BORDER E-COMMERCE COURSES IN HIGHER VOCATIONAL COLLEGES IN THE ERA OF THE DIGITAL ECONOMY

Curriculum reform should be carried out according to the increasing demand for digital cross-border e-commerce talents. Through the four "promotions" and four "reconstructions", we will completely break the deadlock of curriculum reform:

A. Promoting a Comprehensive Restructuring of the Content of Teaching and Learning

Teaching content comes from the positions and industries. Taking the background of the digital economy as the premise, we focus on cultivating more innovative R&D and application-oriented professionals, promoting the construction of disciplines related to the digital economy and cutting-edge digital science and technology innovation, and training students to become talents with the courage to venture into the "no man's land" of science and technology innovations. Teaching content should be produced by collecting the latest international marketing cases and emphasizing the impact of new media marketing on traditional marketing. Adopting blended teaching, expanding online resources, the construction specification of resources should be able to achieve the construction of knowledge systematically; offline activities should be organized to achieve the

process of testing, consolidating, and transforming online knowledge learning, and at the same time, the offline and online processes should be reliably evaluated. Teaching projects should be designed to be interactive and interesting, and at the same time have a certain degree of knowledge density. For example, when we set up the project module of the cross-border e-commerce course, we can combine the two parts of cross-border e-commerce environment and research into a project of "Understanding and Entering the International Market", pay attention to the channels of entering the international markets in line with the current background of the digital economy, and focus on the use of new media (including social media and platforms) technology to achieve the knowledge, research, marketing, etc., of the international market. The project "Understanding and Entering International Markets" pays attention to the channels of entering international markets in line with the current context of the digital economy and emphasizes the use of new media (including social media and platforms) technologies to achieve the steps of international market knowledge, research, and marketing. The fundamental reform of cross-border e-commerce courses can only be completed by comprehensively reconstructing the teaching content.

B. Promoting the Restructuring of the Pedagogy of Classroom Teachers

Teachers should be advocates and practitioners of the digital economy teaching. To improve their teaching ability, they should actively participate in domestic and international academic forums and teaching ability competitions, and enhance the design of teaching in line with the digital economy to improve their teaching level, rather than just staying at the level of teaching marketing disciplines. Teachers should supplement the quantity and quality of the digital economy industry tutors, increase the proportion of skilled and application-oriented tutors, and realize the construction of a high-level teaching team. Teachers are encouraged to adopt advanced information technology means, and teaching in the classroom, project exercises, research, accompanying assignments, and post-course tests are all implemented through digital means. To cultivate teachers' sensitivity to the changes in the digital economy, all teaching is still student-centered, but the goal of cultivation is to adapt to the needs of the digital economy talents in the new era, so they need to have a deep understanding of the cutting-edge forms of the digital economy and think about it. The data generated in the traditional process of consumption, production and service become factors of production, which is the digital industrialization path of the digital economy, and teachers must strengthen the training investment in these aspects and maintain full communication with the industry to meet the needs of the classroom in the new era.

C. Promoting the Restructuring of Cooperative Business Models

Promote innovative engineering integration projects as much as possible, focusing on the layout of internationalized enterprises that have already invested and produced in the digital economy. More research should be conducted to demonstrate the impact of the digital economy on international enterprises in cross-border e-commerce. We can also screen successful cases of digital transformation of traditional multinational enterprises. Set up a digital industry research institute or an off-campus practice base, try to take students on site visits, and job tracking exercises, and integrate work projects into teaching objectives through internships and project cooperation. If there are no realistic conditions, we can try to introduce enterprises into the classroom, or invite enterprise mentors to fully demonstrate the work process in the teaching session, so as to let students perceive the latest digital technology and marketing methods, broaden their horizons, and stimulate their enthusiasm. Strengthen the business incubation and guidance, and encourage students to carry out group entrepreneurial practice. The entrepreneurial threshold of cross-border e-commerce is relatively low compared with other industries, and the cultivation of students' entrepreneurial literacy and the active cultivation of students' entrepreneurial groups are important directions that school-enterprise cooperation should be considered in the future.

D. Promoting the Reconfiguration of Digital Teaching Technologies

Data and digital technology are two key elements of the digital economy. For cross-border e-commerce courses, digital upgrading of software and hardware is imperative. This is not just a digital update of teaching technology, but more importantly, a full integration of digital thinking into the school teaching system. Students' data-handling skills need to become an essential public skills course, as the digitization of records in the digital economy era has led to the widespread use of big data in production, consumption, public governance, and other fields, making it a new element alongside capital labor and natural resources. Students need to master the basic application skills of big data analysis to meet the requirements of data analysis positions that are large in volume, fast speed, multiple types, high value, and true reflection. In the field of cross-border e-commerce, the comprehensive application of digital technology can build a more direct and efficient network. It breaks the plane connection between enterprises and enterprises, between individuals and individuals, and between people and things in the past. It can truly realize the digital industrialization and industrial digitization. The curriculum reform to achieve a breakthrough in this regard will greatly promote the students' initiative to adapt to the arrival of the digital era. The vocational students are expected to become high-level in a new era of applied innovative talents.

CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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