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Integrating Value, Business, and Technology: An AI-empowered Tri-helix Model for Teaching E-commerce English in Vocational Colleges

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ABSTRACT
Current teaching methods for E-commerce English in vocational college often keep language skills, business knowledge, and technology use separate. This does not prepare students for the real digital economy, where they need to combine technical skills, business understanding, and ethical thinking. To bridge this gap, this paper suggests an AI-powered Tri-helix Model. It is a teaching plan that combines Value education, Business skills, and Technology use into one learning experience. This model was built and tested the model through real classroom teaching, using a cross-border live streaming project as an example. The project made, used, and improved the model through real E-commerce English courses. With this model show how it works with a detailed case study of a "Cross-border E-commerce Live Streaming" project. Using the model created interesting and real learning experiences. It helped students build complete skills by working on complex tasks where business choices required using technology and thinking about values. This study gives teachers a clear and usable framework to update their teaching. It helps move from separated lessons to a connected, real-world approach that prepares students for jobs.

1. Introduction: The Integration Challenge

The digital economy has changed global trade, making cross-border e-commerce very important. This change requires vocational graduates who are not just passive learners but active doers who can combine technical skills, business knowledge, and ethics quickly. In this situation, English for Vocational Purposes (EVP), especially for majoring in Cross-border E-commerce (CBEC) students, common English is not enough for them, and Cross-border E-commerce English is no longer an extra subject but a key skill that affects job readiness and business success.

According to China's Ministry of Education's 2021 policy, which mandates integration, but

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teaching methods still remain divided. They do not give students the combined skills needed for the digital market (Yisen, Zhao, 2013). Early research, like Li Zou (2017), found a big mismatch. It showed that most of higher vocational colleges teaching materials in China were not linked to real work situations, and only a few teachers had related industry experience (Li Zou, 2017). This led to teaching that relied too much on language exercises without context. Adding technology first seemed helpful, but its use was often shallow. For example, Liping Jiang (2022) and Xue, X., & Dunham, R. E. (2021) found that a mixed learning model using SPOC platforms could improve general spoken fluency; but, an important skills gap remained, as students' knowledge of specific terms like business terms was still under below (Liping Jiang, 2022). This shows that technology, if not used carefully, does not connect theory and practice.

Policymakers see this problem. The Ministry of Education's (2021) curriculum standards clearly asked for combined growth of "language skill + job skills + cross-cultural understanding" (Ministry of Education, 2021). But, putting this into practice has been uneven. Reported compliance was only 28% in central and western regions, showing how hard it is to move from policy to action (Ministry of Education, 2021).

Later research (2021-2025) looked deeper into using technology and changing curriculum. Studies like Chen & Yeh (2025) proved that Augmented Reality (AR) worked well in specific situations, increasing term memory a lot (Chen, C. H., & Yeh, H. C., 2025). And Zhu W. P, & Wang F. (2025) got strong results through "combining job, course, competition, and certificate," raising vocational certificate success to 89% and much improving employer happiness (Weiping Zhu, & Wang Feng., 2025). But, a major block was found by Wei Liu, & Yushu Ma. (2024). Their survey showed that vocational English teachers were not skilled in using AI-assisted tools, and most of the teacher needed training (Wei Liu, & Yushu Ma, 2024). This lack of digital skill among teachers greatly limits chances for advanced, AI-driven teaching innovation.

New research on school-industry links (2024-2025) shows the continuing gaps. Wang and Jie (2019) used learning data to find that while students actively did high-frequency simulation tasks (completion rates >90%), their willingness to look at real industry materials after class was very low (<15%) (Wang & Jie, 2019). This suggests a lack of inner motivation and an inability to link class exercises with the changing real business world. Although new national quality standards, as outlined in the MOE's (2020 & 2022) Action Plan, are starting to include company reviews, the task of building deeply combined skills in the classroom remains (Ministry of Education of the People's Republic of China, 2020 & 2022).

So, the main problem is not a lack of knowledge or trying, but a basic flaw in teaching design. Current methods, even those using technology or industry parts, often treat language, business skills, and values as separate items to check off. This split model does not prepare students for the connected realities of the digital market, where a marketing choice is at the same time a technology action and an ethical decision.

The goal of this paper is to fix this important gap by offering a practical and united solution: the AI-empowered Tri-helix Model. This model aims to go beyond separation by carefully and systematically mixing Value growth, Business skill, and Technology use into one active learning experience. The paper will first show the model's idea framework. The main part will be a detailed case study of its use in a cross-border e-commerce live streaming project, showing how to do integration. Then, we will look at the results, think about problems, and talk about the

model's wider meaning for creating a full and useful vocational teaching method.

2. The AI-empowered Tri-helix Model: A Framework for Integration

2.1 The Need for a New Approach: Beyond Compartmentalization

Common teaching models in vocational education, though getting better, often do not reach deep integration. As the introduction shows, studies repeatedly find a gap between language teaching and real professional practice (Zhu, Weiping., & Wang, Feng., 2025). The Ministry of Education (2021) has supported a multi-part goal, but using it is still hard. Technology tools like Augmented Reality (AR) seem good for learning specific skills, like remembering terms (Chen C. H., & Yeh H. C., 2025), but they often focus on separate abilities without systematically joining them with ethical thinking and wider business work. Also, combined models like the "job-course-competition-certificate" method show success in getting credentials and employer satisfaction (Zhu, Weiping., & Wang, Feng., 2025), but they may not fully use AI's potential or place the integration within a clear theory structure. The ongoing gap in teacher digital skill (Wei Liu, & Yushu Ma, 2024) also shows the need for a framework that not only says what to combine but also guides teachers on how to handle this combination well. The Tri-helix Model is made to fix these exact limits by offering a complete and practical framework.

2.2 The Conceptual Foundations

The AI-empowered Tri-helix Model is based on two strong theory ideas, changed for vocational language education.

First, it uses the Triple Helix Model of Innovation (Etzkowitz & Leydesdorff, 2000). This model looks at the close relationship between university, industry, and government as drivers of innovation in a knowledge-based economy. We change this model to the small level of course design. Here, the three helixes stand for the main forces that must work together to create new and effective learning: Value (the social and ethical needs, similar to the government's role in setting rules), Business (the industry-led practical skills and knowledge), and Technology (the school and tool-based helper, similar to the university's role in creating knowledge). The teamwork between these three forces creates a dynamic system that helps the growth of complete skills.

Second, the model uses an Ecological View of learning (Bronfenbrenner, 1979). This sees the classroom not as empty but as a complex, changing system. In this system, all parts—the teacher, the students, the curriculum, the technology tools, and the culture—continuously interact and affect each other. Good teaching, from this view, means purposefully designing and managing this system to encourage useful interactions, not just giving content. This idea is supported by findings that show student involvement changes a lot between structured simulations and independent learning (Wang & Jie, 2019), indicating that the learning environment is sensitive to its design.

2.3 Presenting the Model

The AI-empowered Tri-helix Model is shown as three twisted strands circling up around a

central line of "Integrated Learning Experience," as seen in Figure 1. Each helix is different but cannot be separated from the others, and their joint development moves the learning process forward.

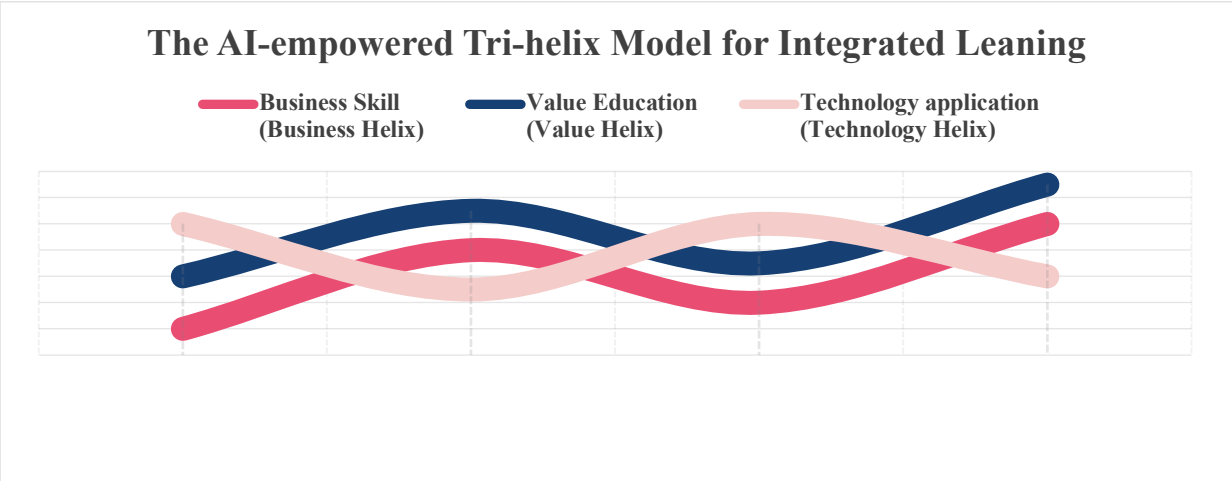


Figure 1. The AI-empowered Tri-helix Model for Integrated Learning.

- The Value Helix:

This helix adds the growth of professional ethics, social duty, cross-cultural awareness, and global citizenship into the heart of business education. It goes beyond treating values as an abstract unit and instead makes them key parts of lasting business success. For example, in cross-border e-commerce, this means understanding and talking about sustainable sourcing, showing cultural care in marketing, following international data privacy rules, and respecting intellectual property rights. This matches the national curriculum's call for "cross-cultural understanding" (Ministry of Education, 2021) and the industry's need for reliable professionals.

- The Business Helix:

This shows the basic knowledge and practical skills needed in e-commerce. It covers the whole work chain, including market study, product choice and sourcing, platform management (e.g., Shopify, Amazon, AliExpress), digital marketing plans (SEO/SEM, social media), supply chain and logistics management, customer relationship management, and data-based decision-making. Learning this helix is the usual, but essential, goal of vocational training, as seen in important tests and certificate programs (Zhu, W. & Wang. F, 2025).

- The Technology Helix:

This helix involves the smart and critical use of digital tools, with a special focus on Artificial Intelligence (AI), to support both business work and value achievement. This includes using AI for market trend study and customer insights, using AI-powered writing helpers to create and improve product descriptions, using chatbots for customer service practice and language training, using teleprompter and video editing software for live stream talks, and using data analysis tools to understand business performance. This meets the known need to go beyond basic technology use (Liping Jiang, 2022) and actively build the digital skill of both students and teachers (Wei Liu, & Yushu Ma, 2024).

2.4 The Role of the Educator as an Integrator and Ecosystem Manager

In the Tri-helix framework, the teacher's job changes basically from a knowledge giver to a "combiner" and "system manager." This role is key to beating the separation found in earlier research. The teacher must design complex learning projects that naturally need the interaction of all three helixes. They must gather a set of right technologies, lead discussions where ethical problems naturally come from business challenges, and test students' ability to combine rather than separate their skills. This change is needed to address the teacher readiness gap (Wei Liu, & Yushu Ma, 2024) and to use the kind of combined quality review imagined by recent standards (Ministry of Education of the People's Republic of China, 2020 & 2022). So, the teacher becomes the helper that makes sure the three helixes do not just exist together but actively support each other to create a strong and changing learning experience.

3. Case in Point: Implementing the Model in a Cross-border E-commerce Live Streaming Project

To turn the Tri-helix Model from theory to practice, we ran a six-week project in a second-year E-commerce English class with 45 students (12 males, 33 females, average age 19.5). The students were put into 9 teams of 5 members each. A pre-project survey showed that over 80% had no prior hands-on experience in cross-border e-commerce, and their self-rated confidence in using professional English for business was low (average 2.8/5.0).

The main task was for student teams to prepare and do a 10-minute English live stream, acting like promoting a product on a global platform such as TikTok Global. This project was made to be a small version of the connected digital workplace.

3.1 Project Overview

The project was set up to clearly require the interaction of all three helixes. The final test looked not only at language and presentation skills (Business) but also at the effective and ethical use of technology (Technology) and the truthfulness and blending of the product's value message (Value).

Table 1. Tri-helix Project Assessment Rubric (Abridged)

Helix Dimension	Evaluation Criteria	Weight	Exemplary (4-5 pts)	Proficient (3-4 pts)	Developing (1-2 pts)
Business	Clarity of value proposition & persuasiveness	30%	Logical and clear; Highly persuasive	The logic is relatively clear, and it has a certain persuasiveness.	Logical confusion, unconvincing
	Fluency & accuracy of professional English		Fluent and professional English	The English basically correct	Numerous English errors
Technology	Seamless & effective use of AI/digital tools	30%	The tool is used skillfully and creatively.	The tool is used correctly.	Unfamiliar with tool usage
	Technical execution of live stream		The technical execution was	Technical execution with no	There are many technical problems.

Table 1. Tri-helix Project Assessment Rubric (Abridged)

Helix Dimension	Evaluation Criteria	Weigh t	Exemplary (4-5 pts)	Proficient (3-4 pts)	Developing (1-2 pts)
			perfect.	major errors	
Value	Authenticity & depth of value messaging	30%	The value narrative is sincere and touching.	The value was mentioned, but the connection is not deep enough.	The value narrative is rigid, shallow, or missing.
	Cultural sensitivity & ethical consideration		Deep integration of culture and ethics	Basically connect with culture.	Mentioned culture but not connected.
Integration	Synthesis of all three helixes in final output	10%	The three are thoroughly integrated and mutually reinforce each other.	All three are reflected, but the connection seems somewhat mechanical.	The three are split, each governing separately.
Total Score		100%			

A detailed grading guide (see Table 1) was made with students to make the expectations clear and testable across the Business, Technology, Value, and Integration parts.

3.2 Phase 1: Planning – Designing for Integration

In this stage, the three helixes were purposefully built into the project plan, going beyond a simple task assignment.

As shown in Figure 2, all teams successfully picked products matching set value themes, showing a first successful blend of the Value Helix into the business planning process.

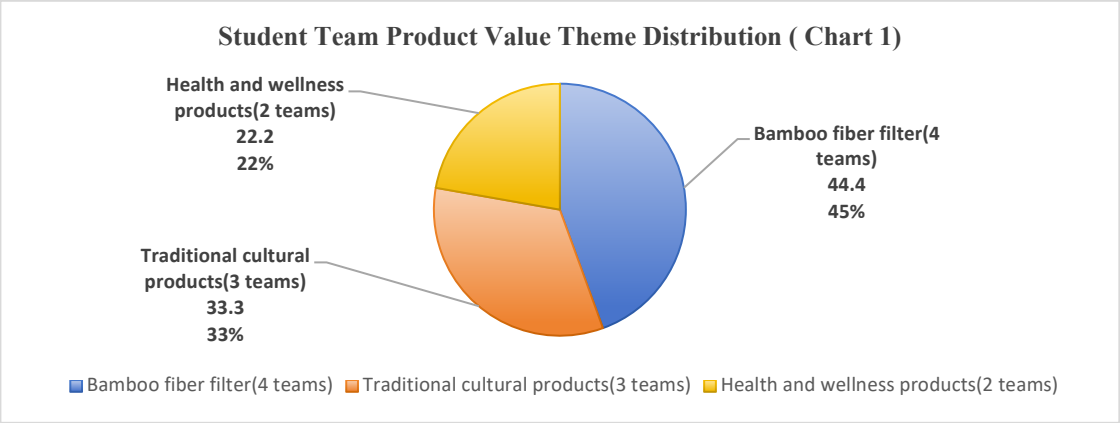


Figure 2. Distribution of product value themes selected by student teams.

- Business & Technology Integration:

Teams had to use an AI-powered market analysis tool (e.g., a trial version of a customer insights platform) to find popular product types and customer interests in their target market, like Southeast Asia. Then they used AI writing assistants to create first creative ideas for their script

and main selling points. This directly addressed the gap found by Liping Jiang (2022), where technology was used but did not deepen specific field knowledge. Here, technology was given the job of directly serving a core business function.

- Value & Business Integration:

The product choice itself became a value-based decision. The teacher asked teams to think about products fitting themes like "sustainability," "support for local artisans," or "health and wellness." For example, one team chose to promote reusable bamboo fiber coffee filters, thus linking a possible business chance with an environmental mission. This put into action the "cross-cultural understanding" and unspoken ethical aspects asked for by the Ministry of Education (2021).

- Technology & Value Integration:

Teams were shown teleprompter apps to help fluency and were told to use real-time translation tools to check their marketing language for accidental cultural rudeness. This connected the practical use of technology directly to the goal of respectful and effective cross-cultural communication (Value).

3.3 Phase 2: Implementation – The Helixes in Dynamic Interaction

During the work, the planned interactions became active, student-led combinations.

- Scriptwriting and Storyboarding:

While writing their script (Business), the team selling bamboo filters used an AI tool to think of ways to strongly communicate the product's biodegradability (Value). The AI suggested phrases like "reduce your plastic footprint," which started a student-led research time on microplastics, as seen in their online talks (Figure 3) and supported by higher platform activity numbers (Table 2). This deepened their real belief in the value message, changing it from a given slogan to a central part of their story.

Communicating a product's biodegradability compellingly involves highlighting its environmental benefits in a clear, relatable, and emotionally resonant way. Here's a strategic approach:

1. **Lead with Tangible Impact**
   - **Example**: "This packaging dissolves naturally in 90 days—like autumn leaves—enriching soil instead of lingering in landfills for centuries."
   - **Why**: Quantifiable timelines make benefits concrete.

2. **Connect to Consumer Values**
   - Frame biodegradability as:
     - **Personal Responsibility**: "Your choice today protects your children's playgrounds tomorrow."
     - **Community Action**: "Join 500K+ eco-warriors reducing plastic footprints."

3. **Visual Storytelling**

Use comparisons to evoke empathy:

"Traditional plastic bottle (450 years to decompose) vs. Our bottle (6 months)"
← Infographic showing decomposition contrast

4. **Certifications & Trust**
   - Flaunt credible labels (e.g., **BPI Certified**, **OK Compost**) prominently.
   - *"Third-party verified to break down toxin-free in home composts."*

5. **Myth-Busting**

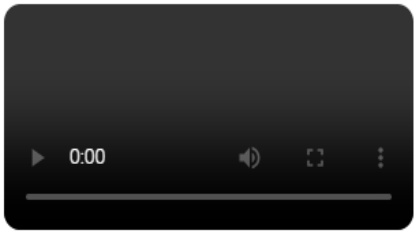
Address misconceptions:

❌ *"Biodegradable = Weak?"*
✅ *"Our materials pass strength tests (ISO 14855) while ensuring full decomposition."*

6. **Lifestyle Integration**

Show real-use scenarios:

- *"Toss it in your garden after use—watch it nourish your tomatoes!"*



← Short demo video

7. **Emotive Language**
   - **Avoid**: Technical terms ("hydrolysis," "polymer chains").
   - **Use**: "Returns to Earth," "Nature's Recipe," "Zero-Guilt Disposal."

8. **Transparency**

Detail the science simply:

"Made from plant starch + sunlight → microbes feast on it → becomes CO_2 + water + biomass. No microplastics left behind."

Key Takeaway

Biodegradability isn't a feature—it's a promise to the planet. Position it as an *active partnership* between the consumer and nature, not passive disposal.

Figure 3.

Table 2 - Online Collaboration Platform Activity Data during the Project Period

Index	Traditional unit (on average)	Three spiral project (this unit)	Variation
The average number of posts in the group discussion area	15 time per set	42 times per set	+180%
Average number of resource shares	8 times per set	25 times per set	+212%
The average duration of active platform visits after class	25 minutes per week	68 minutes per week	+172%

Data from our online learning platform (Table 2) numerically supports this seen rise in involvement, showing a large increase in peer teamwork and self-motivated learning activities compared to earlier, more traditional teaching units.

- Rehearsal and Technical Run-through:

Using the teleprompter app (Technology), students practiced their delivery. The teacher led reflection times, asking questions like, "Does your tone sound real and trustworthy when you talk about the environmental benefits?" (Value) and "Are you using the convincing language structures we learned to point out the product's features?" (Business). This made sure technology use was judged through both a technical and a people-focused view.

- The Live Stream Simulation – Handling the Unexpected:

During the final performance, the teacher added unexpected "customer" questions, like, "Can you give proof for your fair-trade claim?" or "How is this package eco-friendly?" This pushed students into immediate combination of Business knowledge (remembering product facts), Technology (possibly getting their digital notes or product database live), and Value (making an honest, clear, and calming answer).

3.4 Phase 3: Assessment & Reflection – Measuring Integration

Assessment was made multi-part, matching the model's complexity and fitting with new multi-sided evaluation systems (Ministry of Education of the People's Republic of China, 2020 & 2022).

- Business & Technology:

Judged on the clearness of the product pitch, fluency of English, strength of the presentation, and smooth use of visual aids and tech tools.

- Value:

Judged on the truthfulness, creativity, and effect of the value-based message (e.g., how well the environmental or cultural story was mixed into the sales talk).

- Integrated Reflection:

Students wrote a reflection essay looking at how their use of certain technologies helped or blocked their business communication and how their understanding of the product's value changed through the project. This thinking task was important for making the combined learning

experience solid.

The final project scores, judged using the guide in Table 1, are shown in Table 3.

Table 3. Final Project Scores Across the Tri-helix Dimensions (N=9 teams)

Helix Dimension	Mean Score (out of 5)	Standard Deviation
Business	4.2	0.5
Technology	4.0	0.6
Value	3.8	0.7
Integration	3.9	0.5
Overall Score	4.0	0.4

Using the guide gave strong overall performance (Mean Overall Score = 4.0/5.0). As shown in Table 3, students got the highest scores in the Business part, while the Value part, though a bit lower, still showed successful integration, with the Integration score showing a good combination of all three helixes.

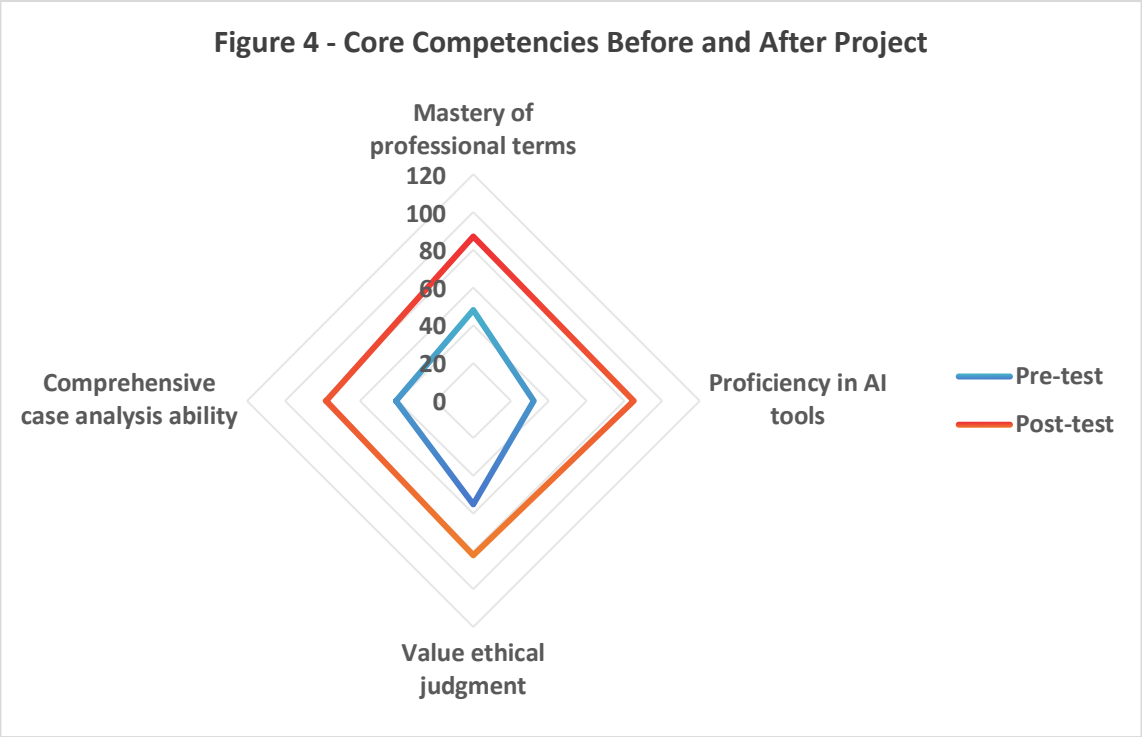


Figure 4. Radar chart comparing student competencies before and after the project.

Table 4 - Statistics of Core Competence Pre - and Post-Test Scores

Index	Average score of the pre-test (%)	Post-test average score (%)	Increase(%)

Table 4 - Statistics of Core Competence Pre - and Post-Test Scores

Index	Average score of the pre-test (%)	Post-test average score (%)	Increase(%)
Mastery of professional terms	48	87	+39
Proficiency in AI tools	32	85	+53
Value ethical judgment	55	82	+27
Comprehensive case analysis ability	41	78	+37

To separate the project's effect, we gave pre- and post-tests. The results, shown in Figure 4 and detailed in Table 4, show clear improvements in all measured skills, with the biggest gains in AI tool skill and specific field term knowledge.

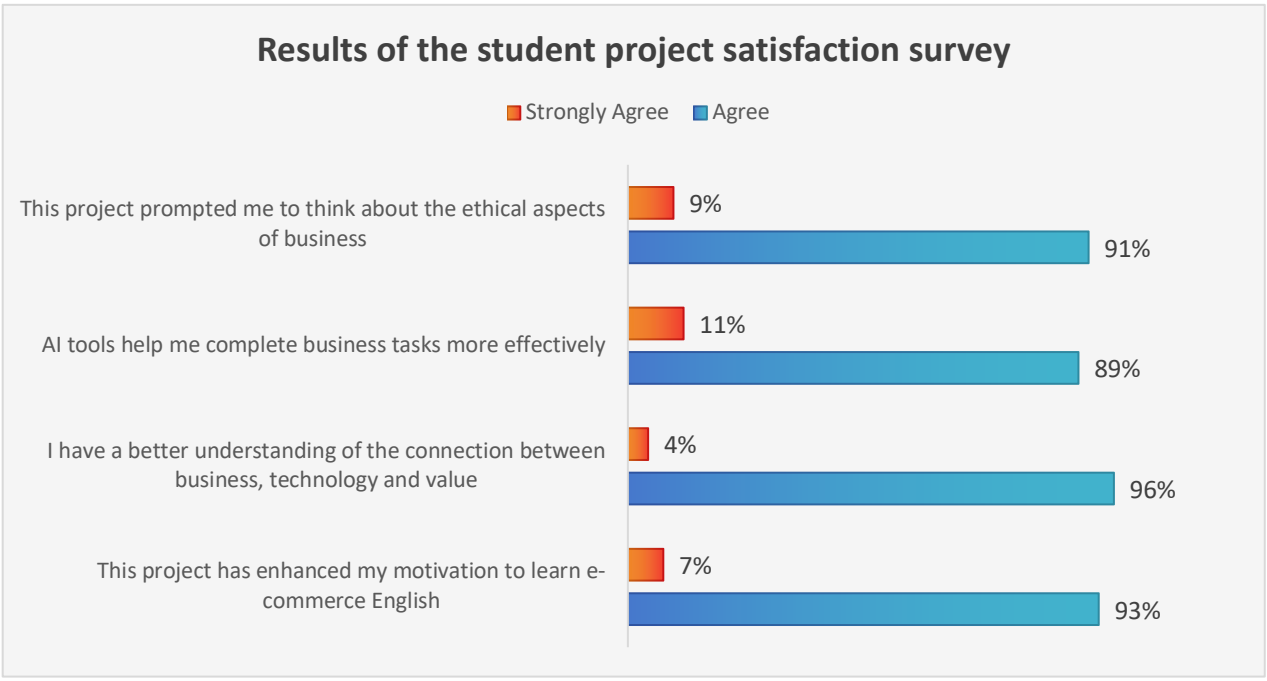


Figure 5. Student views of the Tri-helix project learning experience.

Student opinion survey results (Figure 5) strongly confirmed the positive learning experience. Over 90% of students agreed that the project raised their motivation, understanding of integration, and awareness of ethical business issues.

4. Evaluation and Reflections

4.1 Evidence of Success

The project showed clear success in creating the kind of complete learning setting that earlier research found missing.

- Enhanced Engagement and Ownership:

Student motivation and involvement were much higher compared to traditional, disconnected units. The project's realness gave a clear reason for learning, directly fighting the passive involvement patterns seen in after-class activities by Wang & Jie. (2019).

- Deeper, Synthesized Learning:

Teacher notes and student reflections showed that students were not just memorizing but were critically looking at information, making links between ethics and marketing strategy, and solving problems where all three helixes meet.

- Development of Integrated Competencies:

The final live streams and reflection essays showed a clear betterment in students' ability to combine language skills, business understanding, and technology skill, thus addressing the "separated" skill growth criticized by Zhu & Wang (2025).

4.2 Challenges Encountered and Solutions Adopted

The use had some problems, which gave useful learning.

1. **Challenge 1:** Technical Problems and Different Skill Levels.

Some students first had trouble with the new software, showing the wide digital skill gap noted by Zhao (2023).

Solution: We set up student-to-student tech help groups, using more tech-smart students to help their classmates. This not only fixed the technical issue but also built cooperation and shared responsibility for learning.

2. **Challenge 2:** Surface Treatment of Value.

At first, some teams treated the "value" part as a box to check ("Our product is green.") rather than a built-in part of their story.

Solution: The teacher added short, interesting case studies of real companies that did well or poorly because of their ethical position, starting deeper discussion and pushing students to research and believe in their product's value story.

3. **Challenge 3:** Judging the Interaction.

Grading the detailed interaction of skills was harder than testing separate knowledge points.

Solution: We used a detailed, jointly made grading guide that clearly listed performance standards for each helix and, importantly, for their combination. This made the expectations for "combination" clear and gradable.

4.3 Key Lessons Learned

The main lessons for successful use are:

1. Being purposeful is important – project design must clearly make the helixes interact.

2. The teacher's job as helper and questioner is central to leading students from surface to deep integration.

3. A supportive classroom culture that values ethical thinking and trying as much as business success is necessary.

5. Discussion: Towards a Holistic Pedagogy

Using and judging the AI-empowered Tri-helix Model shows its strong ability to fix the ongoing "integration problem" at the center of vocational E-commerce English education. The model's use can be seen by looking at how it systematically fights the main weaknesses found in earlier studies.

First, the model directly addresses the problem of "separated" teaching ((Zhu & Wang, 2025) through its structure. It does not just say that values, business, and technology should be linked; it builds their interaction through careful project design. The live streaming project forced students to use all three areas at the same time, making sure that a business choice (e.g., a marketing claim) was naturally a technology action (e.g., using an AI writer) and a value-based choice (e.g., making sure of truth and cultural care). This goes beyond the adding method of just including a unit on ethics or a lesson on software, instead building a combined mind in learners.

Second, the model raises technology's role from a side tool to a central helper for deep integration. Unlike mixed learning methods that improved general fluency but failed to set professional terms (Liping Jiang, 2022), the Tri-helix Model gave AI core business and value jobs—market study, content creation, and cultural checking. This smart use meets the call for more meaningful technology integration and gives a practical way to connect theory and practice. Also, by placing the teacher as a "system manager," the model gives a real answer to the digital skill gap among teachers (Wei Liu, & Yushu Ma, 2024). It changes the needed teacher skill from just technical ability to the more planning-focused ability to choose, manage, and support learning in a technology-rich, combined setting.

Third, the model can change testing practices. The multi-part evaluation used in the case study, which considered the interaction of all three helixes, fits well with the new national move towards multi-sided quality tests that include real-world standards (Ministry of Education of the People's Republic of China, 2020 & 2022). By testing combination and reflection, the model shifts focus from remembering separate knowledge to showing combined skill, which is the real mark of job readiness.

The model's changing power comes from its rethinking of teaching as system design. It sees the classroom not as a pipe for sending separate skills but as a dynamic setting where knowledge, skills, and values grow together through interaction. This ecological view explains why the project successfully built high levels of involvement and ownership, fighting the pattern of low independent learning noted by Wang & Jie. (2019). When learning is real, complex, and meaningful, motivation comes from inside.

6. Conclusion and Next Steps

This paper has introduced and tested the AI-empowered Tri-helix Model. The model offers a clear way to combine Value, Business, and Technology in teaching. It helps prepare students for the connected demands of the global digital economy. This model is a direct solution to the common problem of separated subjects in vocational education.

We encourage other teachers to try, use, and improve this model in their own classrooms. Its full value will grow as more people use it and share their experiences in different situations.

For our next steps, we will focus on three main areas:

- **Scalability and Adaptation:** We will test the model in more courses and different types of schools to see how well it works in various settings.
- **Quantitative Validation:** We will develop stronger measurement tools to collect more number-based evidence on the model's effect on specific skills, such as problem-solving and ethical thinking.
- **Teacher Development:** We will create training materials and support programs to help more teachers learn how to be effective "integrators" and "ecosystem managers," which is vital for the model's success.

The work to improve vocational teaching continues, but the AI-empowered Tri-helix Model provides a clear and useful way forward.

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