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Crowdsourcing Used in Higher Education: An Empirical Study on a Sustainable Translation Teaching Mode Based on Crowdsourced Translation

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Abstract: The language service industry needs more qualified translators. The training of qualified translators needs innovation of translation teaching mode. The combination of crowdsourcing and translation teaching can realize the innovation of translation teaching mode. This study developed an empirical study in which such quantitative and qualitative methods are conducted as classroom observation, case analysis, translation quality analysis, questionnaire survey, and email interviews. Participants in the study included university students registered in the English and Translation degrees in Chinese universities. Statistical analyses were carried out with IBM Statistical Package for Social Sciences (IBM SPSS 26). Validation of the survey instruments, descriptive statistics, and group comparisons were all accomplished. The results demonstrate that the integration of crowdsourcing with translation teaching worked well. The mode has positive significance for exploring learner autonomy, stimulating students' motivation, improving students' translation ability, and training qualified translators. The mode is of sustainable value, with the development of AI-driven machine translation technology, and the innovation of translation teaching mode is significant for professional translator training. This mode of translation teaching based on crowdsourcing has a certain reference value for the cultivation of high-quality language service talents and the construction of a new mode of personnel training in the language service industry.

Keywords: crowdsourced translation; higher education; innovation of translation course mode; empirical study

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1. Introduction

The Sustainable Development Goals (SDGs) 2016–2031, defined by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), identify technical and vocational education and training as a strategy for the development of sustainable societies. Alongside the rapid technological changes due to Web 2.0, a need for a sustainable mechanism to train qualified language service talents is crucial to support the sustainable development of societies, cultural exchanges, and educational innovation.

The concept of crowdsourcing was first used by Jeff Howe [1], a journalist for the American computer magazine *Wired*, in an article entitled "The Rise of Crowdsourcing". It mainly refers to "the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call [2]." With the development of information technology and artificial intelligence, this mode has been applied to the field of translation, in which context it is called "crowdsourced translation" [3].

1.1. The Concept of Crowdsourced Translation

"Crowdsourced translation" refers to the process of outsourcing translation tasks initially performed by professional translators to non-specific translators [1–4]. The Translation Automation Users Society (TAUS) calls this new mode "community translation" [5,6],

while Common Sense Advisory, the leading U.S. research firm in the language service industry, calls it CT3, for community translation + collaborative technology + crowdsourcing [7]. Ignacio Garcia, a scholar from the University of Western Sydney, calls self-service translation by Internet users "Hive Translation" [8]. In China, the term "crowdsourced translation" is more commonly used [9–14].

1.2. Characteristics of Crowdsourced Translation

The term "user-generated translation", often used to describe similar collective translation activities of the netizen, developed from the term "user-generated content", which refers to various content types such as images, texts, and videos created by online users of social media platforms [15,16]. There is something in common between user-generated translation and crowdsourced translation, as user-generated translation refers to the translation activity initiated and participated in by individuals or the masses, while crowdsourced translation specifically refers to the activity initiated by formal organizations or institutions with the participation of the public. The two expressions need not be seen as opposed to each other, and can rather be regarded as different stages of mass translation [9].

The basic characteristics of crowdsourced translation are first, the identity of readers as translators, then the combination of traditional human translation with crowdsourced translation. The main body of crowdsourced translation consists of amateur translators from all walks of life who have spare time for engaging in translation. The employer only needs to pay a relatively low translation fee or even no fee at all in order to receive translation shortly after the task is outsourced. This mode not only reduces expenses and time costs, it improves translation efficiency. In addition, driven by artificial intelligence in the past two years, crowdsourced translation has been endowed with new features, and is considered as being "fragmented, digital and intelligent". Among these the feature of fragmentation, which may lead to a lack of coherence and consistency in style, subverts the traditional linguistic school's view of translation [11].

2. Research on Crowdsourced Translation Studies

After the initial concept of crowdsourced translation was put forward, scholars have conducted a considerable amount of studies in this field, especially in recent years. These studies mainly focus on eight aspects: translator [8,12], translation quality [12–15], ethics [14,17,18], culture [19], linguistics [13,14], technology [15,16], commercial application [20], and teaching mode [11].

2.1. An Overview

In terms of the aspect of the translator, under the "hive translation" mode outlined by Garcia [8] a large number of professional translators have been replaced by amateur translators, with only a small number of them still responsible for quality control and terminology specification. Professional translators face the challenges posed by amateur translators; however, they have features that make them irreplaceable. From the aspect of translation quality, Lu [12] believes that when the employer issues an assignment, splitting the original text to different translators does not guarantee the overall coherence of the translation and the consistency of terminology. As each translator is only given a part of the original text, he or she can hardly grasp the context of the text. These problems may affect the quality of translation.

Linguistic scholars believe that grasping the style of the original text at the macro level is crucial to the coherence and consistency of translation [13,14]. However, crowdsourced translation driven by artificial intelligence needs to be divided into multiple micro-tasks, making it insufficient to grasp the overall coherence and stylistic consistency. Thus, it overturns the traditional translation thoughts of the linguistic school [13]. Zhang and Yang [14] argue that the issue of how to screen and manage a large group of volunteers on the Internet to ensure the quality of translations is worth exploring. Most studies at this level have suggested different reasons affecting the quality of translation [12–15];

however, there has not been a more complete system with recommendations on how to ensure quality.

In terms of technological development, the emergence of cloud computing significantly improves the capabilities of information collection, processing, and storage. If cloud computing is applied to the field of translation, and a translation cloud model is thus formed, this can realize the sharing of translation resources such as the terminology bank and corpus, reducing the construction cost of translation platform and enhancing the development space of machine translation and crowdsourced translation [15]. According to SPI (SaaS, PaaS and IaaS), the three-tier service concept of cloud computing, language service providers "will store data and programs in the cloud (server, IaaS platform), turn the network into a huge multi-functional operating system with the help of open APIs (application interface), and exchange information among websites (PaaS and SaaS platforms). Registered users have their own data on the Internet and can use it on different websites" [16].

At the ethical level, Dolmaya [17] analyzed social ethics from three aspects: translator's rewards, translation visibility, and the development of minority languages. Hao [18], on the basis of the descriptive research, conducted a normative study and proposed three sub-categories of crowdsourced translation ethics: translation operation ethics, translation management ethics, and translation social ethics. On the strength of Hao's research, Zhang and Yang [14] adopted the method of multi-case comparative study to elaborate on the ethical issues in current crowdsourced translation from the perspectives of moral and legal norms. Focusing on different stakeholders, the ethical issues faced by the participating users (mainly including translators and clients) and platforms (including platform founders, managers, etc.) are respectively explored on the basis of the functions of each platform, the platform income, and the payment to translators.

At the cultural level, Mo and Hao [19] explored the three-set cultural space of crowdsourced translation, namely, the cultural psychology space, the cultural production space, and the cultural value space. Shao and Cao [20], from the perspective of linguistics, investigated the new impetus and direction that crowdsourced translation brings to language technology and the language service industry as well as translation research. This perspective places more emphasis on the process rather than the result of translation, stressing the concept of "language resources" generated in the translation process.

As a rapidly emerging mode depending on the development of the Internet, crowdsourced translation has been widely used in other fields such as social media, journalism and communication, and language learning. Lu [21] conducted a comparative study on four aspects in typical cases: crowdsourced object, participation purpose, organization form, and performance output. Cao [11] studied the formation and development of film subtitle translation groups from the perspective of the mass translation model. In order to explore a broader market, many volunteers are no longer limited to subtitle translation of films and TV dramas, and rather begin to participate in subtitle translation of public courses initiated by large websites such as MOOC (Massive Open Online Courses), realizing the transition from the "user-generated model" to the "crowdsourced translation model" and the normalization and profitability of crowdsourced translation.

To sum up, the current research on crowdsourced translation can be roughly divided into two types. First, from the theoretical level, studies include the exploration of ethical issues [14,17,18], the interpretation of cultural space [19], and analysis from the linguistic perspective [13,14]. The other type analyzes the application of crowdsourcing into different industries from the practical perspective. This latter type can be further divided into two categories: research on pedagogical innovation [11] and research on technological innovation [22,23]. At present, articles related to crowdsourced translation research have been published in many journals, including *Translation Studies*, *The Translator*, *Chinese Translators Journal*, *Shanghai Journal of Translators*, and *Chinese Science and Technology Translators Journal*. The number of publications is on the rise year by year.

2.2. Translation Course Mode Based on Crowdsourced Translation

While crowdsourced translation can be applied to the above-mentioned fields, it can solve practical difficulties in the field of translation teaching as well [24–26]. Based on the existing research, we believe that the accumulation of a corpus and the application of crowdsourced translation modes are of practical value and significance to both teachers engaged in translation teaching and students conducting translation practice. However, the application of crowdsourcing into the field of translation teaching is comparatively small; by searching through all the existing studies after the concept of crowdsourcing was raised, we found only two studies that used this concept and model and connected it with translation teaching.

Ma [27] argues that crowdsourcing provides both a stable source of translation projects for universities and handles problems such as decreased student motivation and the limitations of translation practice. Moreover, free registration for crowdsourcing platforms facilitates students joining, which provides convenient conditions for students to learn translation through participating in crowdsourced projects. With the increase in the number and scale of Master of Translation and Interpreting (MTI) institutions in recent years, how to improve the teaching quality of MTI has become an important issue. Zhang and Wen [28] designed an online questionnaire to investigate the experiences of MTI students participating in crowdsourced and online volunteer translation in three aspects (participants, participation motivation, and rewards), then proposed the possibility of a course mode based on crowdsourced translation projects.

Based on the above analysis, this new mode of crowdsourced translation has not been widely applied in translation teaching practice [27,28]. The existing research on the combination of crowdsourcing and translation teaching either explored crowdsourced project and translation course modes [27], with the research objects being BTI junior students, or focused on the study of MTI translation courses [28]. However, the existing research aimed to demonstrate the feasibility of this mode, rather than conduct quantitative analysis to evaluate its teaching effect and practical value. This study applies crowdsourced translation to the teaching of MTI translation courses using project-based teaching methods, quantitative analysis, and qualitative analysis. In light of current technological development and practical application, it explores the teaching effect of the proposed mode and its sustainable impact on MTI teaching and the development of translators' competence.

2.3. Purpose and Aims of the Research

The purpose of this research is to discover whether the proposed mode of crowdsourced translation teaching works well for MTI students (future translators) in Chinese universities, and how effective and sustainable this new teaching mode could be. This study considers the following research questions:

- How to effectively use this new teaching mode based on crowdsourcing in translation teaching?
- How to compare traditional translation teaching modes with teaching based on crowdsourcing?
- How to rate the teaching effect based on crowdsourcing?

Answering these questions is important to this research, and from our work we conducted quantitative research and analyzed data. The concept was the combination of crowdsourcing with translation teaching and sustainability in such a mode as to cultivate translators for the language service industry. In this sense, the aims of this research are:

- To apply crowdsourcing to the teaching of translation;
- To analyze the merits of this mode over traditional translation teaching;
- To identify the feasibility of this mode and examine its effectiveness in translation teaching and practice.

3. Methods

This research developed a quantitative and descriptive methodology. The aim of a descriptive study is to identify or describe the dominant situation of a phenomenon at the time of the study [29]. In this way, this research focused on how effective the proposed mode of crowdsourced translation teaching could be for MTI students (future translators) in Chinese universities.

3.1. Design

Translation teaching in crowdsourcing mode should always aim at sustainability in training translators [28]. With the dual objectives of language teaching and translation teaching, the purpose of the teaching design is to consolidate the translation ability of students and guide them to coordinate their expertise and skills with technological platforms [27]. The course in this study is called "E-C and C-E Translation", a compulsory course for MTI in translation in the first semester with two class hours per week.

In order to compare the similarities and differences between traditional translation teaching and crowdsourced translation teaching, the authors divided the course into four phases: the first phase is an overview and introduction to the course, which lasted for two weeks; the second phase adopts the traditional translation teaching mode, lasting for six weeks; in the third phase, the crowdsourcing mode is adopted, which lasted for six weeks; the last phase is a review and summary of the course based on questionnaires and interviews, which lasted for two weeks. The texts for crowdsourced translation selected in this study are real cases from the third phase, while analysis of teaching effect is based on questionnaire and interview feedback in the last phase.

3.2. Sample

The research sample consisted of university students enrolled in MTI Degrees at Northwest University (Xi'an, China), with a study population of 150 students enrolled and invited to participate in the research during the 2021/22 academic year. Participants were first informed of the research purpose, content of the questionnaire, and completion time. The sample was made up of students who had agreed to participate in the study by completing the questionnaire (n = 145). Most of the students majored in English Language and Literature, Translation, and Business English when they were undergraduates, while there are a few who were non-English majors.

The numerical characteristics of the demographic variables were obtained according to the frequency analysis in Table 1. This reflects the distribution of the samples in this research, where the mean value represents the trend and the standard deviation represents the fluctuating case. According to the results of gender frequency analysis, the proportion of male students was 13.1% and of female students 86.9%. The results of this survey mainly reflect the larger proportion of female translation students. According to the results of the age frequency analysis, the sample of this survey was students aged 21–25. The number of students over 30 years of age was relatively small. In terms of their familiarity with crowdsourced translation before taking the course, 48.3% of the students had heard of crowdsourced translation, 37.9% had heard of and participated in crowdsourced translation before, and 13.8% had never heard of it. It can be seen that the vast majority of the teaching groups had a good understanding of the teaching mode, which provided the conditions for the follow-up teaching process.

Furthermore, in terms of the age distribution of the students, most of the participants belong to "Gen-Z", who grew up with the boom in information technology. They have been exposed to and are familiar with the Internet and digital media, and at the same time are good at using technology to serve their learning and life. Therefore, they are highly receptive to new teaching modes, especially information-based translation teaching.

Table 1. Frequency analysis of demographic variables.

Categories		Frequency	Percent (%)	Mean	Std. Deviation
Gender	M	19	13.1	1.87	0.34
	F	126	86.9		
Age	21–25	124	85.5	2.16	0.40
	26–30	19	13.1		
	Over 30	2	1.4		
Familiarity with crowdsourced translation before taking the course	Heard and participated	55	37.9	1.76	0.68
	Heard	70	48.3		
	Never heard	20	13.8		
	Total	145	100		

3.3. Source Text Selection

The authors have been engaged in translation teaching, practice, and research for a long time, and have accumulated a large number of materials suitable for first-year translation students at MTI. At the same time, when combined with the characteristics of crowdsourced translation more relevant and diversified texts can be selected for students' translation practice. For this study, two source texts of the same genre were selected, both of which are E-C texts with progressive difficulty in translation. The first is an excerpt from *The Bridegroom*, a short story by the Chinese American writer Ha Jin, while the second is an excerpt from *A Pair of Tickets* by Amy Tan, another Chinese American writer.

The reasons for choosing the above texts are as follows. First, the two pieces of text are consistent in genre. Second, although both are literary texts, the difficulty in translation is slightly different, which ensures the effect of progressive learning for students. Although both authors are Chinese American writers, their living experiences and educational background differ greatly [30,31]. Ha Jin went to the U.S. at the age of 30 for MA studies, whereas Amy Tan, born in America, is a second-generation immigrant. Third, the stories of both texts take place in China [32,33], and the textual and cultural contexts are familiar to students and easy to understand. However, due to the differences in the authors' background [30–33], the treatment of contexts and expressions in the texts differs, specifically in the treatment of proper nouns and names of people and places. Therefore, for students who are new to the crowdsourcing mode of translation, the difficulty of the two texts is moderate, which is challenging to some extent while meeting the requirements of progressive difficulty in practice. Meanwhile, the differences of these two texts in expression and cultural connotation enable students to compare the language style and cultural diversity during the process of crowdsourced translation, allowing students to adapt to the new translation mode and improve their basic language skills and cultural sensitivity.

3.4. Teaching Methods and Tools

The teaching method used in the third phase of this course (i.e., the experimental phase) was a project-based teaching method under the crowdsourcing mode [27,28,34,35]. From the outset of this phase, students begin by voluntarily forming translation teams of five members each [27], among whom one is the project manager, one is responsible for pre- and post-editing, and three are responsible for translating. The roles among team members rotate from project to project to ensure that each member understands the responsibility of each role and the whole process of crowdsourced translation [28].

When a project is released, the project manager is responsible for task division and text distribution, with an overall grasp of the style of both source language text and target language text. Then, the manager uploads the target text and receives feedback in the process. After the project is completed, the manager submits the final version of the translation and writes a translation practice report which includes a summary of the translation process, reflections on the practice, and solutions to specific problems during the translation process. The student in charge of pre- and post-editing is responsible for editing and terminology searching before translation, as well as proofreading and corpus

collection after translation. The translators are responsible for translating, peer-reviewing, and revising the translation after receiving feedback from the project manager.

The teaching tools used in the process include external resources such as crowdsourced translation platforms, online crowdsourcing communities, online translation platforms, translation software, and corpora [27,28]. Students use these tools to complete the tasks according to their respective roles in the implementation of specific projects.

3.5. Teaching Process

This research was conducted at Northwest University in conjunction with the "E-C and C-E Translation" course for first-year MTI translation students. As mentioned earlier, the entire teaching process was divided into four phases. After two weeks of introduction and six weeks of teaching under the traditional translation course mode, the crowdsourced translation mode was implemented from the ninth week and lasted six weeks.

As shown in Figure 1, the teaching process is divided into the following four steps. In the first step, the instructor introduces the crowdsourced translation mode and project-based teaching to students, then provides various crowdsourced translation platforms, online crowdsourcing communities, machine translation platforms and other external resources for students to choose. After introducing the source texts and authors, the instructor assigns translation tasks. As for students, they voluntarily form a team of five according to the task, and discuss the task requirements in groups. Then, they carry out pre-editing work such as background research and document processing. In the second step, based on the pre-editing work, a terminology database is set up and then imported into the computer-aided translation platform. The students who take on the role of translators in the team start to carry out the subcontracted task. In the third step, the translation drafts completed on the platform are downloaded and organized by the project manager for inter-group evaluation. Then, the manager uploads them to the crowdsourced translation community and receives online feedback. The drafts are finalized after a first round of proofreading (students' self-evaluation and intra-group peer review), second round of proofreading (inter-group evaluation), and final proofreading (feedback from the online community). In the fourth step, the project manager writes a translation practice report based on each member's translation log and sends the final translation and report to the instructor. In the next class, the instructor will offer a summary and an evaluation of the translation task which depend on a formative assessment and summative assessment as well as feedback from readers. Finally, the grade related to the project task is released based on a comprehensive assessment from translation quality, report content, technological performance, project cooperation, and reader feedback.

It can be seen from the teaching flow that students are the main driving force of translation projects. Compared with the traditional translation teaching mode, the learning of students has changed from being "passive" to "active". In this process, students can participate in teaching and learning interactively and reflect on their own performance actively. Meanwhile, the instructor plays a guiding role, monitoring the process and providing technical support, as well as checking the quality of the students' translation.

3.6. Instruments

Data collection was conducted through a survey technique using a commercial online survey research tool, Wenjuanxing [36]. Data analyses were conducted using the IBM Statistical Package for Social Sciences (IBM SPSS 26).

The research questionnaire consisted of two sections: basic demographic data (gender, age, and familiarity with crowdsourced translation before taking the course) and items measuring students' attitudes toward this teaching mode. The questionnaire evaluated students' cognition of crowdsourced translation courses and had 17 items according to four dimensions (Likert scale with 5 response options—1 = minimum agreement and 5 = maximum agreement). Each dimension referred to one aspect of the "students' cognition of crowdsourced translation courses" construct:

Dimension 1. *Student participation. This dimension was defined as students being active and engaged in the classroom as well as students' engagement before and after class.*

Dimension 2. *Cognition of course design. This dimension reflected students' perceptions of the difficulty and content of the translated text and the format of the lectures.*

Dimension 3. *Crowdsourced translation competency. This dimension examined students' mastery of various competencies of crowdsourced translation.*

Dimension 4. *Teaching effectiveness and degree of satisfaction. This dimension reflected teaching effectiveness and student satisfaction with the crowdsourced translation courses.*

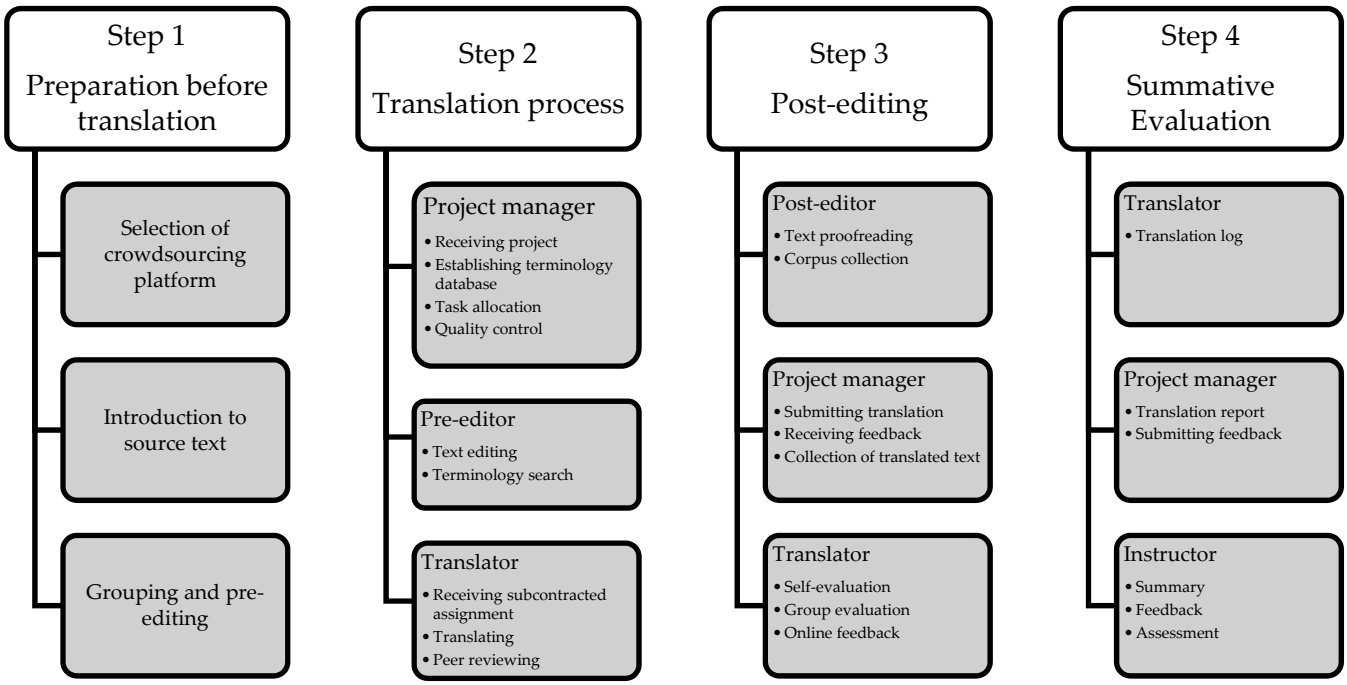

Figure 1. The teaching process under the crowdsourced translation course mode.

3.7. Data Analysis

All statistics were analyzed through IBM SPSS 26. As the questionnaire was self-designed, reliability and validity tests were conducted first. The scale's reliability was estimated by calculating Cronbach alpha values for the construct as a whole and for each individual subscale. The validity was tested by Kaiser–Meyer–Olkin (KMO) and Bartlett's Test. In addition, descriptive analysis was conducted by means of calculation of each dimension to obtain students' perceptions of the crowdsourced translation course. Last, the effects of gender, age and familiarity with crowdsourced translation before taking the course were obtained by independent samples t-test and one-way ANOVA for analysis of variance.

Confirmatory factor analysis (CFA) was conducted in SPSSAU. The convergent validity was evaluated using the average variance extracted (AVE) and the composite reliability (CR), as proposed by Fornell and Larcker [37]. These were considered adequate if AVE $\geq$ 0.50 and CR $\geq$ 0.70. Next, the Fornell–Larcker criterion [37] was used to test discriminant validity. This method compares the square root of AVE with the correlation of latent constructs.

4. Results

4.1. Reliability and Validity Tests

Based on the above reliability analysis results (Table 2), the normalized reliability coefficients are located between 0.755 and 0.946, and the overall normalized reliability

coefficient is 0.780. The reliability coefficient ranges between 0 to 1. The closer to 1, the higher the reliability. This proves the reliability of this analysis is fine.

Table 2. Reliability and validity test in each dimension.

Dimension	Standardized Cronbach's α
Dimension 1: Student participation	0.800
Dimension 2: Cognition of course design	0.755
Dimension 3: Crowdsourded translation competency	0.946
Dimension 4: Teaching effect and degree of Satisfaction	0.815

The coefficients of the KMO test range between 0 and 1. The closer to 1, the better the validity of the questionnaire. According to the results in Table 3, the KMO test is 0.781. According to the significance of the spherical test, the significance of this test is infinitely close to 0, thus, the questionnaire has good validity.

Table 3. KMO and Bartlett's test.

KMO Measure of Sampling Adequacy		0.781
Bartlett's test of sphericity	Approx. Chi-Square	1506.831
	df	136
	Sig.	0

4.2. Confirmatory Factor Analysis

This research used the average variance extracted (AVE) and the composite reliability (CR) to assess convergent validity. It can be seen from Table 4 that the AVE values are all above 0.5, and the CR values are all above 0.7, which means that the analysis data have good convergent validity.

Table 4. Composite reliability (CR), the square root of the average variance extracted (AVE).

Factor	AVE	CR
Dimension 1	0.530	0.813
Dimension 2	0.506	0.752
Dimension 3	0.863	0.960
Dimension 4	0.507	0.804

Fornell and Larcker [37] provided a statistical formula for testing discriminant validity. Discriminant validity is demonstrated if the average variance extracted (AVE) for each construct is greater than the square of the correlation (R^2) between the two constructs. Table 5 presents the analysis of discriminant validity. In all dimensions, the square root of AVEs (0.728, 0.712, 0.929, 0.712) have a greater value than the correlations with other latent constructs. Thus, the results support that all dimensions have good discriminant validity.

Table 5. Discriminant validity.

	Dimension 1	Dimension 2	Dimension 3	Dimension 4
Dimension 1	0.728			
Dimension 2	0.108	0.712		
Dimension 3	−0.067	0.057	0.929	
Dimension 4	0.495	0.096	−0.067	0.712

4.3. Descriptive Analysis

According to the mean statistical results (Table 6), students have the highest cognition of participation, and the teaching effect and satisfaction is good. According to the results

of the descriptive analysis, the absolute value of skewness statistics in each dimension is less than three, and the absolute value of Kurtosis value is less than ten, indicating that the questionnaire data form an approximately normal distribution [38].

Table 6. Descriptive statistics of crowdsourced translation course questionnaire (N = 145).

Dimension	Mean	Std. Deviation	Skewness	Kurtosis
Dimension 1: Student participation	4.1655	0.53944	−1.14	5.396
Dimension 2: Cognition of course design	3.7414	0.34663	−0.873	−0.052
Dimension 3: Crowdsourced translation competency	2.1397	0.32123	2.009	2.31
Dimension 4: Teaching effect and degree of satisfaction	4.0634	0.48746	0.161	−0.158

According to the descriptive statistics regarding different dimensions and questions (Table 7), it can be seen that in Dimension 1 the vast majority of subjects have high willingness to complete assignment before and after class, listen to the instructor in the crowdsourced translation class, and discuss with their teammates when they encounter translation or technical problems. A small number of subjects believe that the teammates are slightly less motivated in completing the crowdsourced translation task. Overall, student participation is satisfactory during the crowdsourced translation course.

Table 7. Descriptive statistics of each item (N = 145).

Dimension	Items	Mean	Std. Deviation
Dimension 1	In the crowdsourced translation class, I will be more serious about completing the preview work and after-class assignments.	4.19	0.707
	In the crowdsourced translation class, I prefer to listen to the instructor's comments on the content and result of translation assignments.	4.22	0.661
	During the process of crowdsourced translation, I am willing to discuss translation or technical problems with my teammates.	4.32	0.676
	My teammates are active in completing the crowdsourced translation task.	3.93	0.684
Dimension 2	I think the selected source text for the crowdsourced translation task is moderately difficult.	3.73	0.475
	I like teamwork.	3.68	0.484
	I am willing to complete any role that is assigned to me, no matter translating, editing, reviewing or acting as project manager.	3.78	0.433
	The teaching process of crowdsourced translation course can help students improve their crowdsourced translation ability effectively.	3.78	0.433
Dimension 3	I think it is difficult to use a crowdsourced translation platform.	2.17	0.373
	I think it is difficult to complete translation tasks with machine translation.	2.15	0.36
	I need help from my teammates to complete tasks.	2.08	0.276
	I think it is difficult to construct a corpus using a crowdsourced translation platform.	2.16	0.367
Dimension 4	Through the crowdsourced translation mode, I have a deeper understanding of translation.	4.16	0.561
	The crowdsourced translation course mode can help me master more translation tools.	4.27	0.556
	Crowdsourced translation can improve translation efficiency.	4.1	0.73
	The quality of crowdsourced translation is better.	3.71	0.735
	Crowdsourced project-based teaching has improved my independent learning ability.	4.08	0.607

In Dimension 2, most subjects consider the translation texts selected for the crowdsourced translation course as moderately difficult. They are willing to take any role in translating, editing, reviewing and project managing. They believe that the teaching design could help students improve their translation capability. In Dimension 2, one of the relatively low satisfaction measures felt by participants is shown on Question 6: "I like teamwork", which reflects similar problems with the question "My teammates are active in completing the crowdsourced translation task" in Dimension 1. Therefore, in future changes in teaching design, it should be taken into full account how to mobilize the enthusiasm of students as members of a team, and avoid their dependence on teammates.

In Dimension 3, the overall mean value is low. According to the questions in this dimension, most subjects do not find it difficult to use the crowdsourcing platform and set up the corpus, and find it convenient to complete in-session translation tasks using machine translation. Meanwhile, most subjects believe that they can complete in-session and off-class tasks without the help of others. To sum up, the students have good ability to use the crowdsourced translation platform and complete their crowdsourced translation tasks independently.

In Dimension 4, the vast majority of subjects believe that crowdsourced translation courses could help them master more translation tools, have a more profound understanding of the translation process, and improve their independent learning ability. The relatively low value in this dimension is obtained for the question "The quality of crowdsourced translation is better." It can be seen that students' doubts mainly focus on the translation quality of the crowdsourced translation mode. The reasons are as follows: the translator usually does not get the complete version of original text, and s/he may not be able to grasp the context before translation. The style and cultural awareness of different translators vary, which results in inconsistent translation quality. These may be taken into account and discussed in teaching, with examples of how to avoid the above-mentioned problems.

4.4. Difference Analysis

4.4.1. Gender

According to the above independent sample t-test results (Table 8), the differences in terms of various dimensions in gender are presented in Table 6. The test results of difference significance among dimensions 1 to 4 on gender is 0.948, 0.679, 0.941 and 0.998, respectively, all of which are greater than 0.05. This shows that there is no gender difference in student participation, cognition of course design, crowdsourced translation competency, or teaching effect and satisfaction with the crowdsourced translation course.

Table 8. Analysis of variability in gender across various dimensions.

Dimension	Variable	N	Mean	Std Deviation	t	Sig.
Student participation	M	19	4.16	0.47	−0.066	0.948
	F	126	4.17	0.55		
Cognition of course design	M	19	3.71	0.35	−0.415	0.679
	F	126	3.75	0.35		
Crowdsourced translation competency	M	19	2.14	0.35	0.074	0.941
	F	126	2.14	0.32		
Teaching effect and degree of satisfaction	M	19	4.06	0.52	−0.003	0.998
	F	126	4.06	0.48		

4.4.2. Age

According to the above results (Table 9), the difference significance test result in terms of age among dimensions 1 to 4 is 0.145, 0.449, 0.256 and 0.614, respectively, all greater than 0.05. This shows that there is no significant statistical difference in terms of age in student participation, cognition of course design, crowdsourced translation competency, or teaching effect and satisfaction.

Table 9. Analysis of variability in age across various dimensions.

Dimension	Variable	N	Mean	Std. Deviation	F	Sig.
Student participation	21–25	124	4.15	0.55	1.954	0.145
	26–30	19	4.22	0.41		
	Above 30	2	4.88	0.18		
Cognition of course design	21–25	124	3.73	0.36	0.806	0.449
	26–30	19	3.79	0.29		
	Above 30	2	4.00	0.00		
Crowdsourced translation competency	21–25	124	2.14	0.32	1.375	0.256
	26–30	19	2.11	0.32		
	Above 30	2	2.50	0.71		
Teaching effect and degree of satisfaction	21–25	124	4.06	0.50	0.49	0.614
	26–30	19	4.07	0.43		
	Above 30	2	4.40	0.28		

4.4.3. Familiarity with Crowdsourced Translation before Taking the Course

From the above results (Table 10), the difference significance test result in terms of familiarity with crowdsourced translation before taking the course from dimensions 1 to 4 is 0.02, 0.818, 0.799 and 0.336, respectively, all greater than 0.05. This shows that student participation, cognition of course design, crowdsourced translation competency, and teaching effect and satisfaction of crowdsourced translation courses do not have significant statistical differences in familiarity with crowdsourced translation before the course.

Table 10. Analysis of variability in previous crowdsourced translation experience across various dimensions.

Dimension	Variable	N	Mean	Std. Deviation	F	Sig.
Student participation	I heard and participated before.	55	4.30	0.48	4.023	0.02
	I heard of it before.	70	4.13	0.49		
	I haven't heard of it.	20	3.93	0.76		
Cognition of course design	I heard and participated before.	55	3.72	0.39	0.201	0.818
	I heard of it before.	70	3.75	0.32		
	I haven't heard of it.	20	3.76	0.32		
Crowdsourced translation competency	I heard and participated before.	55	2.12	0.30	0.225	0.799
	I heard of it before.	70	2.16	0.33		
	I haven't heard of it.	20	2.14	0.34		
Teaching effect and degree of satisfaction	I heard and participated before.	55	4.14	0.51	1.099	0.336
	I heard of it before.	70	4.01	0.42		
	I haven't heard of it.	20	4.05	0.63		

Through the above difference analysis, gender, age, and familiarity with crowdsourced translation before taking the course do not affect the teaching effect. Therefore, the course arrangement is reasonable.

5. Discussion

A multi-evaluation mechanism is applied in this research, which includes students' self-evaluation, intra- and inter-group evaluation, instructors' comparison and feedback of translation texts, evaluation of translation practice reports, and reader feedback from the online crowdsourcing community. In addition, to measure the teaching effect of the crowdsourced translation mode combined with project-based tasks, the instructor conducted an online questionnaire and email interviews in the last two weeks of the course.

Through online questionnaires and email interviews, the participants all found it meaningful to participate in this type of translation research and had a deeper understanding of the comparison between the traditional translation teaching mode and the crowdsourced translation teaching mode. Moreover, they provided good feedback on the

project-based translation teaching under the crowdsourcing mode, and believed that the new mode was more effective than the traditional one (Table 11).

Table 11. Comparison between traditional translation teaching mode and crowdsourced translation teaching mode.

Translation Teaching Mode	Traditional Translation Teaching Mode	Crowdsourced Translation Teaching Mode
Translation process	Source texts—translators—target texts	Splitting source texts—crowdsourcing—integration—target texts
Operation procedure	Translating—proofreading—teacher assessing—feedback	Pre-editing—initial version—times of proofreading—feedback from the platform—multi-evaluation
Role of translators	Translating	Translating, editing, proofreading, project manager
Improvement of translators' professional quality	One-way improvement from individual practice to teacher's feedback	Multi-way improvement in many aspects such as translating, editing, proofreading and platform using
Team composition	Individuals or groups	In the form of professional team with each member taking a role and relevant responsibility
Teamwork	Single, closed, time and space limitation	Multi-way, open, dynamic, no limitation of time and space
Computer & network technology	Basically no network and technology dependence	Strong network and technology dependence
Translation speed	Relatively slow	Fast
Translation quality	Depend on the translator	Significantly higher than that of a single translator
Degree of students' participation	Individual work and classroom interaction: moderate participation	Participation in translation process, cooperation on platform, teamwork and classroom interaction

Specifically, according to the questionnaire most of the participants believe that they improved their learning ability, translation ability, collaboration ability, social skills, and technical skills through the crowdsourced translation teaching mode. In terms of learning ability, the participants' acquisition ability was significantly developed, which is reflected in the aspects of "acquiring new skills", "learning new knowledge", and "increasing motivation to continue learning". In terms of translation ability, the crowdsourced translation teaching mode facilitates participants to "improve their linguistic competence", "enhance their translation ability", "learn more translation skills through teamwork and crowdsourcing", and "understand the real translation process". Concerning collaborative skills, the participating groups have "enhanced the sense of teamwork", "cultivated the awareness of customer service", and "promoted translation efficiency". With regard to social skills, the participants have developed their "sense of belonging to the community". Certain aspects such as "communication skills" and "communication skills on online platforms" have been fully exercised. In terms of technical skills, "the use of crowdsourcing platforms and online communities", "translators' information literacy" and "the ability to obtain external resources" have all been improved to varying degrees.

In general, the three abilities or skills that the participants improved most significantly are "translation ability", "technical skills" and "collaboration ability". The vast majority of participants (95.8%) feel that participation in this teaching process "improves translation skills" and "text processing skills". Most participants (92.4%) believe that the project is effective in improving students' ability to use online platforms, and 89.9% of them think that they have developed teamwork and interpersonal communication skills.

According to the email interviews, the participants think they have gained much from the translation teaching mode, with emphasis on the improvement of translators' literacy and teamwork. Regarding the use of crowdsourcing platforms and online translation

platforms, several participants report that "the rapid development (of these platforms) has provided great convenience for people working in translation field", one of the reasons being that "people do not have to be tied to offices; when they log onto the platform, they can start working freely and submit their work by the deadline". The second reason is that "in the context of the international community, the translation workload is increasing day by day, and the contents are diverse, so online translation platforms can help translators reduce the burden and improve the efficiency by using machine translation and building their terminology database. It allows translators to better serve for the communication and development between countries." For the improvement of technical skills, the participants learn basic knowledge and skills such as "conversion of PDF into editable documents", "fast proofreading", "basic format conversion of terminology database" and "construction of a corpus". As to the role of translators in the new era, the participants believe that "translation has long evolved from manual translation through computer-aided translation, to crowdsourced translation, and we, the students majoring in translation, should keep up with this trend, strive to master new technologies and methods, and update our skills." With regard to the translator style, the participants feel that "maintaining the consistency of translator style in the mode of crowdsourced translation is a challenge, which needs to be experienced and understood in practice." As regards the problems revealed in this teaching process, one student stated, "on the one hand, we are not very proficient in the operation of the computer-aid translation software, which consumes a lot of time in the preliminary stage of translation; on the other hand, we are not accustomed to the crowdsourced translation mode, so that the work distribution and the consistency of translation styles cannot be well considered."

6. Significance and Limitations

In this research, crowdsourcing and project-based teaching were applied to an MTI translation course. Based on this mode, students were exposed to the real translation process through doing crowdsourced translation projects. They applied relevant networking and translation technologies, practiced teamwork skills, released translation results, and received feedback [39]. This mode meets the requirements of Education for Sustainable Development (ESD) to promote learning of skills, perspectives, and values necessary to foster sustainable and committed societies [40]. The teaching process lasts for one semester, from introduction to individual practice under the traditional teaching method, then to the collaborative translation project under the crowdsourcing mode, and finally assessment and feedback. Through the multi-evaluation mechanism and the feedback of participants, this teaching mode has proven to be effective and innovative [41].

First, the participants showed high recognition to the teaching effect of the crowdsourced translation mode, and believe this mode could effectively enhance the motivation of students [42]. Comparing the traditional translation teaching mode with this new mode, participants are clearer about the combination of human translation with machine translation and computer-aided translation [43,44]. Second, students improve their language proficiency and translation ability in this practice, which achieves the expected teaching objectives. Furthermore, students have the opportunity to apply translation technologies [45]. Their translation skills, use of crowdsourcing platforms, and understanding of the online crowdsourcing community are enhanced, which enables them to have an experience of what it is like to be a professional translator [46,47].

At the same time, it is still rare to apply this mode to the research and practice of MTI teaching in China [28], and few cases can be found for reference. Therefore, there are limitations in the teaching practice. First, the application of the new mode needs the cognitive transformation of both teachers and students. Teachers should revise the traditional teaching mode, while students have to accept the new mode and improve learner autonomy in order to jointly deal with various problems in the process of such projects with a more positive attitude. Second, the difficulty of the translation materials needs more consideration. The two cases chosen in this research belong to a moderate level

with similar cultural context and background, however, according to students' feedback other cases in the experimental period are slightly more difficult. The main reasons for this problem are due to the style and context of selected texts, as well as the fact that students have different knowledge structures and translation abilities. Therefore, the difficulty of selected texts will affect the learning effect. Third, in such a new teaching mode teachers' time and energy in and out of class cannot be measured only by the fixed hours of this course. It is difficult to handle a large amount of workload such as teaching evaluation and feedback with only one teacher. Thus, in order to implement this kind of teaching mode and make it sustainable, teachers with similar teaching objectives and research interests need to work together as a team.

7. Conclusions

This research proposes an MTI translation teaching mode based on crowdsourced translation and project-based tasks, and explores the practical problems and their solutions in the teaching process. The feasibility of the crowdsourced translation teaching mode is demonstrated by quantitative and qualitative methods such as classroom observation, case analysis, translation quality analysis, questionnaire, and email interviews. Meanwhile, the research has proven that this mode makes a positive impact on constructing a sustainable translator training mechanism, exploring learner autonomy, stimulating students' motivation, improving their translation ability, and training qualified translators.

As a comparatively novel model, more experiments and exploration are required in order to make it sustainable for translation talent training. Future studies can be carried out by employing the experimental method [48–50] to improve the effect of translation teaching. Moreover, in a sustainable mechanism, language service personnel can be trained by other institutions and organizations. This mode is not limited to the universities where this research was carried out; it could be conducted by other institutions as well. Future studies could cover a broader context of education services, including community colleges, private skills training organizations, and private HEIs. This would enable more understanding regarding the language service industry and its talent training mechanism.

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