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STUDY ON JOINT CURRICULUM AND ITS IMPROVEMENT MECHANISMS IN TRANSNATIONAL HIGHER EDUCATION

¹ Jingyao Su

Affiliation 1:

School of Foreign Studies
 Nanjing University
 163 Xianlin Avenue
 210023 Nanjing
 P.R.China
 Tel.: +86 13815856913
 E-mail:yaoayao1221@126.com

Affiliation 2:

School of International
 Education
 Nanjing Institute of Technology
 1 Hongjing Avenue
 211167 Nanjing
 P.R.China
 Tel.: +86 25 86118330
 E-mail:sujyao@njit.edu.cn

² Jing Jiang

School of International Education
 Nanjing Institute of Technology
 1 Hongjing Avenue
 211167 Nanjing
 P.R.China
 Tel.: +86 25 86118716
 E-mail: jiangjing@njit.edu.cn

¹**Jingyao Su**, (*corresponding author*), is a PhD Candidate at the School of Foreign Studies of Nanjing University, China. She also works as director of the teaching management office at the School of International Education of Nanjing Institute of Technology, China. She has presided over two and participated in several research projects and published several papers. Her research areas include educational comparison, internationalisation of education and higher education management.

²**Jing Jiang**, MA, is the executive dean of the School of International Education of Nanjing Institute of Technology, China and an Associate Professor in English. She obtained a Master's degree from the University of Sheffield, UK. She is interested in education management research and has published many articles in this area. She also has extensive practical experience in transnational education.

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ABSTRACT. *Literature concerning transnational higher education (TNHE) usually discusses curriculum theoretically at the macro-level or analyses the design of a specific course at the micro-level. This paper does empirical research and analyses the joint curriculum documents of TNHE programs in the major of computer engineering of several Chinese universities. Using text analysis and Wilcoxon signed-rank test, the paper studies the significant differences of curriculum systems between TNHE programs and non-TNHE programs, including education goals, required credit points and course distribution. Curriculum characteristics in independent TNHE institutions are discussed specifically.*

The research then creates a mechanism for continuous improvement of TNHE programs' curriculum system and elaborates three aspects of joint curriculum integration: effective utilisation of introduced course resources, the establishment of joint courses and condensing of course content. The integration involves three levels, from inside of one course to interconnection of course modules. Cooperation between teachers of two partner universities and the construction of an online teaching platform could serve as an instrumentality for curriculum improvement.

KEYWORDS: transnational higher education, curriculum improvement, introduction of course resource, course integration.

JEL classification: M40, C30.

Introduction

Transnational education (TNE) does not mean the flow of students: students themselves do not have to move across borders, they could remain in their home country, it is the educational program which would be delivered from a foreign provider to their domestic university (McNamara, Knight, 2015; Bauk, 2019). Besides the term “TNE”, there are actually three other similar concepts, namely: cross-border, offshore and borderless education. Although some scholars believe that the term “cross-border higher education (CBHE)” is to some extent more explicit and descriptive, the connotation of the terminology “TNE” has gone beyond its conceptual foundation and has been widely used (Knight, 2016). Based on the general recognition of the terminology “TNE” in academia, this paper also uses “TNE” to discuss international cooperation in education. “TNHE” is used to refer to transnational higher education.

There are two main modes of TNHE in the Chinese Mainland, one is “running schools abroad” and the other is called “Chinese-foreign cooperation in running schools”. “Running schools abroad” means that the educational institutions in the Chinese Mainland cooperate with educational institutions abroad which are recognised by the government of the host country (region) to implement educational and teaching activities outside the Chinese mainland with overseas citizens as the main target of enrollment. “Sino-foreign cooperation in running schools” refers to the educational cooperation between foreign educational institutions and educational institutions in the Chinese Mainland with Chinese citizens as the main target of recruitment. The principal place for running the Sino-foreign cooperative programs should be in the Chinese Mainland. Compared with the form of “running schools abroad”, the model of “Chinese-foreign cooperation in running schools” has always been the main model of TNHE in the Chinese Mainland. Furthermore, the model of “Chinese-foreign cooperation in running schools” mostly adopts a form of “double degree program”, that is, when requirements of both Chinese and foreign parties are met, two degrees could be awarded by Chinese and foreign universities respectively. According to the TNE framework constructed by Knight (2016) and the key elements of different forms of TNE, the double degree program is one category of TNE which reflects the cooperation in respects of academic qualification and oversight between local and foreign providers. The research object of this paper is the double degree programs of Sino-foreign cooperation in running schools. In order to ensure the unity of terms-using and the conciseness of discussion, “TNHE” is used

hereinafter to refer to the category of Chinese-foreign double degree cooperative programs of universities.

The launching of TNHE in China started in the 1980s. With the rapid development of economic globalisation and the internationalisation of higher education, the number of TNHE-programs has been increasing (Ključnikov *et al.*, 2020). According to the Department of International Cooperation and Exchange of the Chinese Ministry of Education, by the end of 2020, there were altogether 2,332 TNHE programs in the Chinese Mainland (including TNHE-institutions). The growing scale of TNHE has attracted more and more overseas teaching resources into the field of Chinese education, which has played an important role in promoting the development of Chinese domestic education. However, the proliferation of TNHE in China also brings various problems. The purpose of TNHE is to introduce high-quality educational resources from developed countries and regions, to improve the Chinese domestic education system and to cultivate outstanding talents with international vision. However, regarding the actual situation of TNHE, the phenomenon of “emphasising quantity but neglecting quality” has appeared. Some colleges and universities blindly aim at the so-called popular majors when carrying out TNHE-programs, ignoring their own characteristics. Due to the lack of domestic curriculum resources and teachers, the implementation of major modules basically depends on the curriculum resources of the partner university, while the Chinese side mainly carries out general education. The splicing model of Chinese and Western courses leads to splitting of the whole curriculum system and the entire acceptance of introduced course content often results in maladjustment. Some programs only meet the quantitative requirements of the Chinese Ministry of education formally on the number of introduced courses but there is a lack of in-depth consideration to determine which courses should be introduced. In the specialty education module, the organic connection between domestic and introduced courses is not strong enough. The reason for the above-mentioned problems is that the curriculum system of TNHE-programs is not sufficiently demonstrated. An inappropriate curriculum system could have a serious negative impact on teaching, on the quality of students’ cultivating, on the social reputation of the program, and even shake the foundation of the whole program. While TNHE in China is booming, there are also programs that have been disqualified for failing to pass the regular assessment by the Chinese Ministry of Education. Therefore, in order to realise the high-quality and high-level development of TNHE, it is fundamental to construct a scientific and appropriate curriculum system.

Previous research on the TNHE curriculum system is mainly based on theoretical analysis, lacking data support. The study of curriculum design is mostly confined at the micro level, discussing the design of specific courses. In addition, there are few researches on comparisons of curriculum systems in different universities and the conclusion scope is not widespread enough. This paper takes the curriculum systems of TNHE programs in several universities as the research object and tries to analyse the curriculum systems of TNHE programs in China from a macro perspective. Through data analysis, the common characteristics of the curriculum systems regarding Chinese TNHE programs would be found. The weak links in the curriculum system would be discussed. The improvement direction of the TNHE curriculum system would be put forward. Practical and concrete improvement measures would be given.

1. Literature Review

Some researchers discussed how transnational education policies were implemented in the local curriculum and came to the conclusion that the local interpretation of the policies is

selective, the selection process termed “reception” and “translation” (Wahlström, 2018; Sedziuviene, Vveinhardt, 2019). Other studies showed that the internationalisation of higher education has affected the higher education sector, making it focus on increasing diversified curriculum (Rumbley *et al.*, 2012).

The meaning of “transnational” is not limited to moving between two societies but also taking root locally and belonging to more than one society simultaneously (Doherty, 2018). The transfer of transnational curriculum materials from provider country to host country at the physical level is far from enough, the local applicability, acceptance, understanding of the curriculum content should also be considered (Waterval *et al.*, 2017). It is emphasised in some searches that the curriculum provider should adapt the curriculum content to the host’s local context (Dominique *et al.*, 2018), the transnational curriculum should be a bilateral integration outcome.

A few researchers explored the importance of bilateral cooperation in designing transnational curriculum through case studies. Lee (2020) investigated a Sino-British transnational nursing education program and found out that the curriculum systems in the two countries are quite different. The differences make the curriculum merger process more complicated. To handle the issues, discussions are required. An interview-based report by Cheng (2017b) described how the curriculum writers for Malaysian-British dual degree programs struggle with the differences between the Malaysian and British education systems and try to meet the requirements of quality assurance institutions of both sides. Nordin, Sundberg (2021) took the 2011 Swedish curriculum reform as an example and analysed the dynamic process of reinterpretation of TNE concepts in a domestic environment. Some critical opinions were put forward in terms of borrowing and transplanting the Euro-centric curriculum system to the local context of China’s Suyang curriculum reform (Zhao, 2020).

There are also researchers who discussed the standards and methods of curriculum design and development, especially in a transnational background. Aponte, Jordan (2019) proposed a criterion for the internationalisation of the curriculum from three dimensions: the institutional dimension, dimension of the academic program and dimension of the learning environment (Marks-Bielska *et al.*, 2020; Popov *et al.*, 2019; Draskovic *et al.*, 2019; Świadek, Gorączkowska, 2020). Those three dimensions represent the curriculum internationalisation also at three levels: at the institutional level, at a faculty level and in the classroom. Deng (2015) raised a similar proposal of dividing curriculum-making into three levels, the institutional, the programmatic, and in the classroom. He suggested that curriculum should be considered as a multi-level concept, including an epistemological dimension involving many ways of understanding, a normative dimension involving the purpose of schooling, and a practical dimension involving curriculum making. Clarke *et al.* (2015) built a transnational curriculum design framework that comprises seven stages. In that framework, the curriculum should be designed with full consideration of student profile, local and global culture. On the basis of periodic data, the curriculum could be reviewed and further improved. He, Liu (2018) found two strategies in cross-cultural curriculum design: the “collaborating” strategy and the “accommodating” strategy. Some researchers discussed the curriculum design for one specific discipline: Ellis (2020) compared two methods of language curriculum design: language structure-based method and task-based method. He claimed that a modular curriculum could combine the advantages of the two methods.

In the Chinese TNHE context specifically, the earliest researches of TNHE can be traced back to the 1990s. The number of papers published with Chinese TNHE as a research topic generally shows an increasing trend, from initially a few articles per year to 500-600 articles per year in recent years, although a slight decline could be found in 2020. Despite the

huge number of published papers, the research on the curriculum of TNHE-programs started late. It was not until about 2000 that articles focusing on the curriculum design of TNHE-programs were published, and the number was small. By 2020, the proportion of published articles concerning curriculum every year was always less than one-tenth of all published articles with the theme of Chinese TNHE in the same year. In addition, similar to global context's research on TNHE curriculum, the research on TNHE curriculum mainly involves theoretical exposition of the importance of curriculum construction, the strategies of curriculum design and reform, case studies of one specific TNHE program or design of one particular course. The previous research suggests a lack of comparison of curriculum systems in several TNHE programs at the same level and a lack of quantitative analysis. *Are there any common elements in Chinese TNHE-programs' curriculum systems? What characteristics do the curriculum systems possess? What effective and feasible measures could be taken to improve the existing curriculum system?* These are the issues that need to be analysed in this paper.

2. Statistical Analysis

There are two main forms of Chinese TNHE. The more common form of them is to hold TNHE programs relying on ordinary Chinese universities, for the Chinese universities can also utilise their own teaching resources. The two cooperative sides usually choose one major which they both offer in domestic university as the major of the TNHE program. In order to distinguish the TNHE program from the normal Chinese domestic program in the same major, the major of the TNHE program would be marked with “cooperative” and the normal major would be marked with “non-cooperative”. In TNHE intuitions, all majors are carried out in the form of TNHE programs and each TNHE intuition has a main cooperative university partner, which is usually one of the world-famous universities. Compared with TNHE programs in ordinary colleges and universities, TNHE intuitions have more transnational education resources and are more flexible in the program running.

The research object of this paper is the curriculum system of TNHE programs. The word “curriculum” derives from Latin and means “to run”. In the modern education system, there are different interpretations of the connotation of “curriculum”. The curriculum is understood as key means to put the university idea into practice (Barnett, 2009), as a systemic policy which is implemented in schools and classrooms (Lingard *et al.*, 2013), as all students' learning experiences, including the course content itself, the interaction between students and course content, the interaction between teachers and students and the interaction among students themselves (Chugh *et al.*, 2017).

In a broad sense, the elements contained in the curriculum involve multiple dimensions. According to Rosenlund (2019), the curriculum consists of three sections: subject aims, core content in the course and the knowledge requirements used by teachers. Wahlström, Sundberg (2018) have similar opinions, they claimed that the purpose, content and knowledge requirements should be closely linked together in the conception of curriculum. Based on the multi-dimensional interpretation of the terminology “curriculum”, some collateral and subordinate concepts are created. For instance, lessons are termed “curriculum events”, teaching is regarded as “an act of curriculum transformation” (Wahlström, 2018), subjects or courses of study are called “programmatic curriculum”, which should be embodied in “curriculum documents” (Deng, 2009).

The analysis of the curriculum system in this paper bases on the data in curriculum documents of Chinese colleges and universities. According to the statement of Deng (2009),

the actual research object of this paper is “programmatically curriculum”, one subordinate concept of curriculum. In the background of higher education in China, this “programmatically curriculum” has a special name, which can be literally translated as “talent training scheme”. In this paper, data from seven ordinary Chinese universities are analysed first. The curriculum documents of cooperative programs and non-cooperative programs in the same major of computer engineering are compared. The differences of the curriculum in cooperative and non-cooperative programs are elaborated. Then, the characteristics of the curriculum system in seven Chinese TNHE intuitions with independent legal personalities are discussed. In order to establish the comparability of the curriculum system, the analysed major has always been the same, namely computer engineering.

2.1 Curriculum Analysis of Seven Chinese TNHE-Programs

According to the “talent training scheme” (curriculum documents), no matter cooperative programs or non-cooperative programs, the same university always uses the same standard to classify courses. Although there are slight differences in the names and settings of course types in the seven universities, basically the curriculum is divided into several education modules.

Table 1. Curriculum modules of TNE programs

| Modules | Types of Courses |
|------------------------------------|--|
| General Education Module | English Language Courses; Mathematical Courses; Physical Sports Courses; Ethics and Law Courses; History and Culture Courses; Career Planning Courses |
| Specialty Education Module | Major Courses; Major Extended Courses; Independent Major Practical Courses |
| Interdisciplinary Education Module | Interdisciplinary Courses |

Source: compiled by authors.

As shown in *Table 1*, education modules mainly include “general education module”, “specialty education module” and “interdisciplinary education module”. Each module consists of different types of courses. Although the “general education module” contains a variety of courses, “specialty education module” is the main part of the curriculum system. It needs a special explanation that the type of “independent major practical courses” listed in *Table 1* only refers to the type of courses conducted in an independent and concentrated practice mode. Major courses including both theoretical lectures and practices are not counted as independent major practical courses.

2.1.1 Text Analysis of Talent Cultivating Goals

Curriculum designing is competence-based (Cai *et al.*, 2017). Competence here refers to the ability that students need to acquire. In other words, the curriculum system should closely focus on the talent training goals. After a comparative analysis of the texts, which describe the talent cultivating goals of cooperative programs and non-cooperative programs, it

is found that the talent cultivating goals of cooperative programs are slightly different from the non-cooperative ones.

The following table shows the differences in talent cultivating goals of cooperative programs and non-cooperative ones for the same major “computer engineering”. Listed are only differences in talent cultivating goals. Overlaps and similarities in talent cultivating goals are not shown in the table.

Table 2. Differences in talent cultivating goals

| | Cooperative Programs | Non-Cooperation Programs |
|----|---|---|
| U1 | cultivating compound engineers and technical talents | cultivating talents who are able to solve complex engineering problems in related professional fields |
| U2 | cultivating talents with international communication ability; cultivating talents with service consciousness; cultivating talents with group spirit; cultivating talents with manipulative ability | |
| U3 | cultivating talents with international competitiveness; cultivating talents with intercultural communicative competence | |
| U4 | | cultivating talents who are able to solve complex engineering problems in related professional fields |
| U5 | cultivating talents with solid basic knowledge foundation and wide range of knowledge; cultivating talents with ability to consider and solve problems from multiple angles | cultivating talents with special expertise |
| U6 | cultivating talents with humanities accomplishment; cultivating talents with cross-cultural communication ability; cultivating talents with high English language level | cultivating talents who are able to solve complex engineering problems in related professional fields |
| U7 | cultivating talents with excellent English language proficiency | cultivating excellent engineers |

Notes: “U” refers to “University”.

Source: compiled by authors.

It can be seen from *Table 2* that cooperative programs emphasise the cultivation of talents with an international vision. Expressions as “international”, “intercultural” and “cross-cultural” are used by universities to describe the corresponding abilities. In terms of cultivating professional abilities, cooperative programs pay more attention to comprehensive abilities, including interpersonal communication ability, the ability of organisation, coordination and English language, while non-cooperative programs attach importance to engineering practical ability, which is expressed as “being able to solve complex engineering problems”.

2.1.2 Significant Test of Credit Points

According to the description of required course credits in curriculum documents and the division of course types in *Table 1*, the total required credits of each type of course is calculated. A comparison is conducted in terms of the credit requirements of cooperative programs and non-cooperative programs for each type of course. Take “type of language courses” in “general education module” as an example: In one university, required credit points of language courses respectively for the cooperative program and non-cooperative program form one pair of paired data. Seven pairs of paired data are then generated by

repeating the above-elaborated steps in the seven universities. Those seven pairs of data constitute two groups of paired data. One group is data of cooperative programs, the other is data of non-cooperative programs. Take the two groups of paired data as paired samples, it can be investigated whether there is any significant difference in credits requirements of English language courses between cooperative programs and non-cooperative programs.

According to the above-mentioned methods, the required credits of each type of course and the total required credits are analysed. The results show that the differences in credit requirements between cooperative programs and non-cooperative programs express in two types of courses: language courses and major courses. There is also a significant difference between cooperative programs and non-cooperative programs regarding the total required credits of the curriculum system.

Table 3. Wilcoxon signed-rank test report for credits points (Ranks)

| | | N | Mean Rank | Sum of Ranks |
|--|----------------|----------------|-----------|--------------|
| Credits of English Language Courses Cooperative – Non-Cooperative | Negative Ranks | 6 ^a | 3.5 | 21 |
| | Positive Ranks | 0 ^b | 0 | 0 |
| | Ties | 1 ^c | | |
| | Total | 7 | | |
| Credits of Major Courses Cooperative – Non-Cooperative | Negative Ranks | 6 ^a | 4.5 | 27 |
| | Positive Ranks | 1 ^b | 1 | 1 |
| | Ties | 0 ^c | | |
| | Total | 7 | | |
| Total Credits of all Courses Cooperative – Non-Cooperative | Negative Ranks | 6 ^a | 4.33 | 26 |
| | Positive Ranks | 1 ^b | 2 | 2 |
| | Ties | 0 ^c | | |
| | Total | 7 | | |

a. Non-Cooperative < Cooperative

b. Non-Cooperative > Cooperative

c. Non-Cooperative = Cooperative

Source: calculated by authors.

Table 4. Wilcoxon signed-rank test report for credits points (Test Statistics^a)

| | Credits of English Language Courses Non-Cooperative – Cooperative | Credits of Major Courses Non-Cooperative – Cooperative | Total Credits of all Courses Non-Cooperative – Cooperative |
|------------------------|--|---|---|
| Z | -2.207 ^b | -2.197 ^b | -2.028 ^b |
| Asymp. Sig. (2-tailed) | 0.027 | 0.028 | 0.043 |

a. Wilcoxon Signed Ranks Test

b. Base on positive ranks

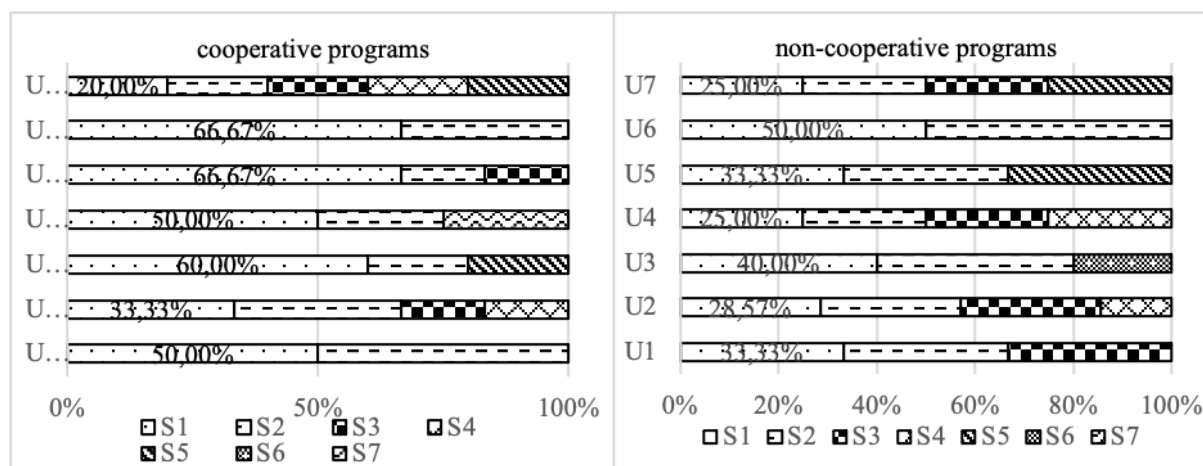
Source: calculated by authors.

As shown in *Tables 3* and *Table 4*, the required credit points of cooperative programs are more than non-cooperative programs in terms of language courses, major courses and all the courses in total. The significance (2 tailed) of the Wilcoxon signed-rank test is less than 0.05, proving the significant difference in statistics.

Required credits are directly proportional to required study hours. The more credits, the more study hours. Based on the statistical analysis above, it can be inferred that for cooperative programs, significantly more study hours are required than for non-cooperative programs in terms of language courses and major courses.

2.1.3 Analysis of Course Distribution

Although the curriculum system can be divided into different modules, it should be noted that the so-called modules in those universes are still semester-based. Most courses still need to be completed in the designated semester. The courses' distribution of the whole curriculum system is analysed by calculating the number of courses in each type per semester. The distribution of English courses varies slightly from cooperative to non-cooperative programs, as shown in the following figure (Figure 1).



Notes: "U" refers to "University" and "S" refers to "Semester".

Source: compiled by authors.

Figure 1. Distribution Contrast of English Language Courses

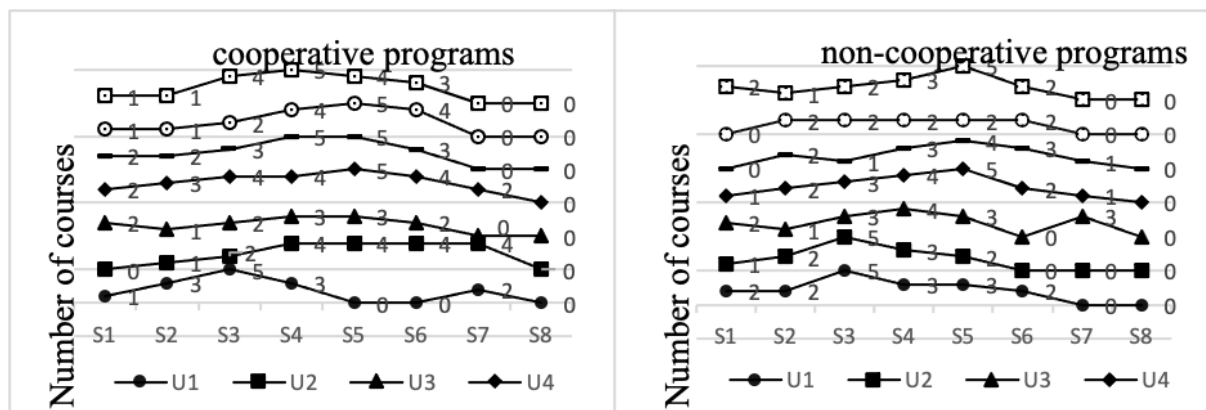
According to Figure 1, for both cooperative and non-cooperative programs, most English courses are set in the first academic year (first and second semester). Comparatively speaking, English language courses in cooperative programs are more densely distributed than in non-cooperative programs. As Figure 1 shows, in cooperative programs of five universities, 50% or more than 50% of the English courses are arranged in the first semester.

Combining the analysis results in section 2.1.2 and compared with non-cooperative programs, on one hand, more credits are required for English language courses in cooperative programs, on the other hand, intensive training of English is more emphasised.

Comparing English courses content in cooperative and non-cooperative programs, it is found that in cooperative programs more attention is paid to the cultivation of practical English communicative skills and the preparation of English proficiency tests for studying abroad. Courses like English listening, speaking, reading and writing are jointly designed and offered by two partner universities. "IELTS English" and "TOEFL English" are taught. In contrast, English courses in non-cooperative programs are deemed as common English courses, such as "college English" and "academic English".

The reason why the type of English courses is highlighted as a focal point is that the acquisition of English language proficiency is considered as one of the most common challenges of talent cultivating in cooperative programs (Mehalik *et al.*, 2008).

As already discussed in section 2.1.2., the required credits of major courses in cooperative programmes are more than in non-cooperative programmes. But no significant difference has been found as for the course distribution.



Notes: “U” refers to “University” and “S” refers to “Semester”.

Source: compiled by authors.

Figure 2. Distribution Contrast of Major Courses

As shown in *Figure 2*, no matter for cooperative or non-cooperative programs, a common “rule” is that the number of major courses generally increases from the third semester and the increase maintains up to the fifth semester. The number of major courses decreases from the sixth semester. In other words, the major courses are mainly distributed in the third to fifth semesters, namely in the sophomore year and in the first half of the junior year.

There is no significant difference in the distribution of other types of courses either. Except for the English courses in some universities, other courses belonging to the general education module are generally scheduled to be completed in the first two academic years. Major extended courses are usually offered in the form of optional courses for specialty direction, usually starting from the fourth or fifth semester. Independent major practical courses are commonly set in the last academic year. As for the interdisciplinary courses, they are distributed in each semester for options.

2.2 Curriculum Characteristics of Seven Chinese Independent TNHE-Institutions

In terms of talent training goals, there is not much difference between TNHE programs in ordinary universities and independent TNHE institutions. They are all committed to training international professionals. TNHE institutions differ from the ordinary TNHE programs in that the courses offered by TNHE institutions are more abundant and diverse.

As shown in *Table 5*, the curriculum characteristics of TNHE institutions are mainly manifested in four aspects. First, there are various types of courses in general education and each TNHE institution has its own unique general education courses. Second, more choices for major and major extended courses are provided and major directions are more specified. While professional competence is cultivated, students’ personalised development is also supported. Third, there is a high degree of correlation and integration between general education and specialty education. On the one hand, the course content in the general education stage can enlighten students in terms of the decision of major. On the other hand, the basic knowledge and skills taught during general education can lead students to complete the transition from general study to professional study. Fourth, course resources besides the curriculum system itself are offered. Some courses in the curriculum system can be replaced

with other related courses in the global educational network. Generally speaking, the curriculum system in TNHE institutions is more flexible.

Table 5. Curriculum Characteristic of TNE Programs in Independent TNE Institutions

| | Diversity of General Education Courses | Selectivity of Major and Major Extended Courses | Integration of General Education and Specialty Education | Utilization of Off-Campus Educational Resources |
|-----|--|---|--|---|
| U8 | 48 units in general education, including (a) 32 units of core (GEC) courses; (b) 12 units of distribution (GED) courses; and (c) 4 units of whole-person education experiential (WPEX) modules | 55 options of two main streams for 6 major extended courses | general education helping students finally choose and transit to major study; (GEC)education offering courses which cultivate students' transferable skills; foundation courses offered by divisions in (GED) education giving students a glimpse of different disciplines | opportunities for students to spend a semester abroad and to choose 24 units of free electives courses overseas |
| U9 | basic knowledge module of natural science and social science, module of key skills for study and life | two major optional modules | some major courses being provided in stage of general education, leading students to their major study | several options of studying abroad for one or two semesters during the undergraduate study (credit-bearing) |
| U10 | 7 components, including social foundations, cultural foundations, writing, mathematics, science, algorithmic thinking and language | at least 11 options for 2 major extended courses | general education running before or parallel with major education, depending on students' own organization of their study schedule | possibility of replacement of some required major courses and major elective courses with equivalent courses in the university's global network with prior approval |
| U11 | three common core course modules and several elective modules deriving from divisional areas, such as arts and humanities, natural and applied sciences, social sciences | major divisional foundation courses, interdisciplinary studies courses, disciplinary studies courses, signature work and experiential education | common core courses helping students gradually extend and strengthen their common experience and communication skills, finally find out their personal academic interests | opportunity of choosing two elective courses in the university's global network; exchange possibility in partner university for one semester |
| U12 | academic English courses, foundation courses of physical sciences, mathematical techniques and programming | 4 options for 2 or 3 major extended courses in the 3rd year; 10 option courses for minimum of 90 and maximum of 100 credits in the 4th year | basic knowledge of the major field is taught during general education, such as introduction to programming and algorithms | opportunities for students to do exchange at partner universities overseas |
| U13 | 2 basic general education modules(mandatory) and 4 elective general education modules | 17 options in group A for 3 major extended courses; 14 options of group B for the other 3 major extended courses | flexibility and autonomy in study sequence of general education modules and major modules | opportunities for students to do exchange at partner universities overseas |
| U14 | modules of culture (CNCC) education, art education (A.E.), physical education and language education | 3 group options for major concentration module; major elective courses (15 credits) and free elective courses (7 credits) | science courses mixed in general education; major capstone courses arranged in the stage of general education | opportunities for students to do exchange at partner universities overseas |

Notes: "U" refers to "University".

Source: calculated by authors.

The reasons why the curriculum system in TNHE institutions is characterised by flexibility could be explained from two aspects.

From one aspect, compared with ordinary TNHE programs, TNHE institutions think highly of general education, that is the difference in educational philosophy. In the talent cultivation plans of those TNHE institutions, it is mentioned that the “liberal arts education” is followed. The concept of “liberal arts education” originated from ancient Greece and Rome (Koblik, Graubard, 2000). In modern society, liberal arts education is regarded as a kind of general education based on the cognition of “being a social man”. Harvard Committee has categorised liberal arts education into the following areas: the humanities, the social sciences, science and mathematics (Cheng, 2017a). Nowadays, viewpoints and values required by modern society should also be added to liberal arts education (An *et al.*, 2020).

In China, although the adoption of Western liberal arts traditions and models is allowed by the Ministry of Education (Jiang, Guo, 2017), there have already been many meaningful attempts to combine Chinese and Western education models. Some researchers support the view that Confucian tradition counts as the Chinese version of liberal arts education. In the conceptualisation of liberal arts education, three sources were integrated into each other, namely the prototype of “liberal arts education” in the Western context, Confucian philosophy and the ideas of the government leaders (Yang, 2015; Yu, 2020). In TNHE institutions, general education not only contains courses that impart basic knowledge of humanities, social and natural sciences but also courses about Western culture and Chinese national conditions, aiming at the localisation of liberal arts education and keeping pace with the times. In addition, basic skills and academic methods related to majors are also taught in the stage of general education.

From the other aspect, a gap in terms of conditions for program-running exists between ordinary TNHE programs and TNHE institutions. Compared with the ordinary TNHE programs, TNHE institutions have more educational resources. TNHE institutions have highly competitive faculty, including resident teachers of the partner university, and can offer more courses. More options are provided both in general education and in specialty education. A variety of general courses enriches the content of general education and special general courses are set up to realise the transfer from general education to specialty education. More options in major courses module mean a wide optional scope for professional directions, which can help students gain a deep understanding of their major and more accurately meet the actual needs of the job market. In addition, TNHE institutions have a global educational network and rich international course resources pool. Course replacement mechanism and credit recognition policy endow students with higher study autonomy. Students can arrange their own study schedule freely to a certain extent based on the credit requirement in a certain module, thus a “discrete and self-contained” (Klotz, Wright, 2017) module-based study is realised. As discussed above, modular teaching is still based on the semester in ordinary TNHE programs. Limited by the course resources, most courses in general education and specialty education modules are compulsory courses and need to be completed within a particular semester. Therefore, the course distribution of ordinary TNHE programs is mostly clearly defined by the curriculum system and the so-called modular teaching is to a certain extent a framework with little substance.

3. Results and Discussions

When designing the curriculum, a “retrodict” way of thinking should be followed. That means the design and construction of the curriculum should base on the expectation of

teaching and the talent training goal. Regardless of ordinary TNHE programs or TNHE institutions, their talent training goal is similar: to train professionals with international vision and strong comprehensive ability. Backwards from this talent training goal, the construction of the curriculum should highlight the cultivation of students' intercultural ability and the promotion of their comprehensive quality.

The courses offered by TNHE institutions are diverse, with a wide range of options. General education is closely related to specialty education, which is conducive to broadening students' horizons, helping them in developing in an all-around way and improving their professional abilities. In addition, the cultivation of students' ability is not limited to the curriculum content but is also reflected in the fact that the curriculum system gives students more autonomy in the study. The ability of self-planning is the embodiment of students' comprehensive qualities and belongs to the core abilities for further study and career development. Of course, this flexible curriculum system could also lead to the polarisation of students: some students get broader opportunities for personal development in a study environment with rich study resources and strong autonomy, while others have an academic crisis due to a lack of subjective initiative in the study.

The curriculum characteristics of the ordinary cooperative programs are generally expressed in two main aspects. First, the adjustment of some course content. The content of English courses tends to follow the concept of pragmatism and the content of major courses is a combination of the two cooperative universities. Second, the distribution adjustment of English courses, such as adopting intensive training module. However, the by-product of these two approaches is the increase of credit requirements. In fact, due to the restriction of educational resources, the curriculum system design of cooperative programs in ordinary colleges and universities basically bases on the curriculum system of non-cooperative programs, only small revisions are made, not many innovations are created. Moreover, the adjustments of course content and course distribution seem to be insufficient of being recognised as weighty evidence of having adopted appropriate methods to achieve the goal of "cultivating international professionals". Overall, the curriculum system of ordinary cooperative programs is not highly consistent with the talent cultivating goal.

However, it should be noted that the same quality standards cannot be used to evaluate the quality of all TNHE programs, for individual differences of institutions and programs should not be overlooked (Lin, Liu, 2016). The plan of curriculum as a whole is in line with the economic efficiency of program-running. TNHE institutions are well integrated into the international education network and have more configurable resources. The curriculum construction of ordinary TNHE programs yet relies on and is limited to the objective conditions. When designing the general and interdisciplinary education modules of ordinary TNHE programs, the curriculum system of non-cooperative programs is always taken as a reference. Considering the cost of program-running, the utilisation of courses and other factors, most of the introduced courses in ordinary TNHE programs are major courses, a few of them are English courses. These factors have led to the adoption of a simple "platter" model in the curriculum system of ordinary TNHE programs. The advantage of doing this is that the curriculum system of cooperative programmes can be consistent with that of non-cooperative programs in form, which ensures the standardisation of the whole university's teaching system and makes effective use of configurable domestic educational resources as much as possible.

However, since it concerns double degree programs, the curriculum system must conform to the regulations of both universities. There are always cognitive differences of the key knowledge and skills to be taught in the cooperative programs, different requirements of

credit points and different standards of calculating study hours from the two partner universities. All those factors are mixed in the competition of educational sovereignty. The final result is that both sides try their best to set the courses they think are necessary in the curriculum system. A curriculum system including all the essential courses meets the requirements for awarding the degree certificates of both sides but also sets a higher request to the credits to be earned. Moreover, this mosaic joint curriculum system has not formed an organic whole, because the integration among education modules and courses is lacking. It can be said that although the curriculum system of TNHE programs in ordinary universities has reached the standard in form, there is still a long way to go in terms of connotation construction. How to construct and improve the curriculum system of TNHE programs under the existing conditions? This is an important issue to be discussed.

Although the curriculum system of TNHE institutions is relatively reasonable, there are at present only nine independent TNHE institutions in China and the rest of more than 2,000 TNHE programs are all carried out by ordinary universities. Only by improving the curriculum system of ordinary TNHE programs can the overall level of Chinese TNHE be improved. As discussed above, TNHE institutions have unique conditions for program-running. Their experience cannot be totally applied to the implementation and governance of TNHE programs in ordinary universities but their ideas and methods of program-running can still provide the ordinary TNHE programs with some enlightenment. Some ordinary colleges and universities have already started the attempt of curriculum reform of TNHE programs. Among the seven universities which are studied in this paper, one university has introduced two cultural courses offered by its partner university, another university has cooperated with its partner in course co-construction, involving English and mathematical courses. Both universities have extended the cooperation from the field of specialty education module to the general education module. Their experiences show two models of cooperation in the field of general education. First, the introduction of courses from the partner university. Second, carrying out the course of co-construction. According to their experiences, it is worth noting that other types of courses besides English can be also introduced from the partner university or be co-constructed by both sides.

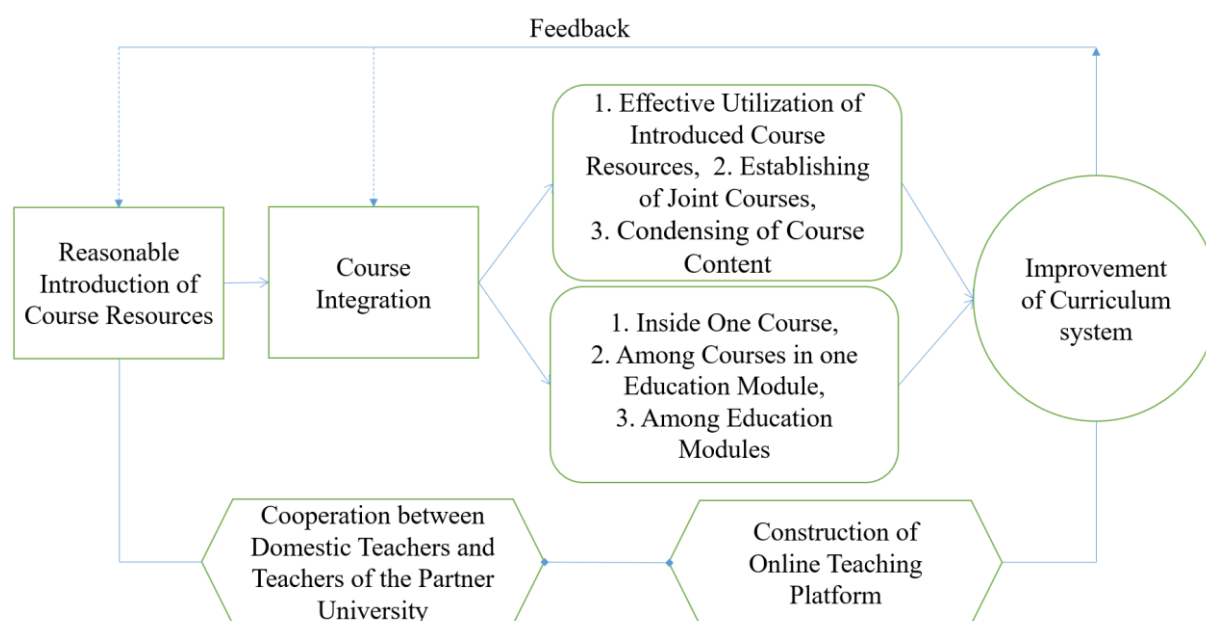
From the perspective of the actual implementation of TNHE programs, if a number of introduced or co-constructed courses are only offered for TNHE programs, the cost of TNHE programs will be increased and a number of course resources will be wasted. In view of this, the utilisation of introduced educational resources should be improved by extending the covering scope of introduced and co-constructed courses. The introduced and co-constructed general courses could be open to the whole university and a small number of introduced major courses or co-constructed major courses could be open to the non-cooperative program in the same major.

If course co-construction is promoted and the introduced educational resources can be made full use of, the curriculum system would be improved. What concerns course content, since teachers of the two partner universities fully discuss the courses to be offered, the deep integration among courses could be promoted, knowledge and skills that both sides attach importance to could be covered and the course content could be appropriately streamlined. Concerning the teaching model, cooperative teaching would promote the cooperation between domestic teachers and teachers of the partner university, so that both sides can learn from each other, overcome their weaknesses by acquiring the other's strong points and improve the teaching ability and teaching methods together. Concerning program-running costs, if the target of the introduced or co-constructed course could be extended to the university level, the costs would be shared by the whole university. Concerning the construction of the curriculum

system, if some courses in the general education of TNHE programs could be set open to the whole university, a reform in general education at the university level could be promoted. That could be termed the “radiation effect” of TNHE programs.

The cooperation in course co-construction is also helpful to other aspects. Due to the constraints of costs and teaching teachers’ tasks in their universities, there are few teachers of partner universities who are able to reside in the ordinary TNHE programs. Usually, teachers of partner universities only come to China for short-term intensive teaching. This model of intensive teaching has artificially compressed the teaching duration. Some courses that should be carried out in parallel have to be taught one after another, resulting in the isolation of knowledge points that are contained in different courses and are supposed to be complementary to each other. To a certain extent, this kind of teaching model is contrary to the teaching regularity and severely affects the teaching quality. Whether it is a course in general education or in a specialty education module, if teachers of the two partner universities cooperate in teaching, the teaching duration can be effectively extended. Domestic teachers can continue to teach after teachers of partner universities leave the campus. Teachers of partner universities can continue to participate in teaching by remote participation in the teaching slots when they are back at their own universities. It should be emphasised that distance participation in teaching can only be realised with the usage of modern teaching platforms. In China’s higher education field, there has been a relatively mature MOOC (Massive Open Online Course) teaching platform. In the post-epidemic era, since the physical transfer of people around the world has been affected to varying degrees, the mode of distance teaching has been adopted by more and more universities around the world.

Based on the above analysis, an improvement mechanism of TNHE programs’ curriculum system can be established, as shown in the following figure.



Source: compiled by authors.

Figure 3. Mechanism for Continuous Improvement of TNHE Programs’ Curriculum System

As shown in *Figure 3*, the improvement mechanism of TNHE programs’ curriculum system begins with the introduction of teaching resources from the partner university. In terms

of introducing courses, the rationality of introduced courses should be demonstrated. As mentioned above, the introduced courses can include necessary specialty education courses, some general education courses, and even a few interdisciplinary education courses. In the next step, all courses in the curriculum system should be integrated into a whole. From the first aspect, the introduced course resources should be made for rational use. Access to the introduced courses in general and interdisciplinary education modules could be provided to all majors in the relevant domestic university and the introduced specialty education courses could be set open to the non-program in the same major. From the second aspect, the cooperative two universities should adopt cooperative teaching to compensate for the shortcomings of short-termed intensive teaching and make the best of their respective advantage. From the third aspect, on the basis of the above-mentioned two aspects, the cooperative two sides should restructure the courses. Reasonable requirements of credit points should be set. The content of compulsory courses should be condensed and only necessary course content should be kept. From another dimension, the integration of courses can be divided into three levels. First, when conducting cooperative teaching for a certain course, the division of work between domestic teachers and teachers of the partner university should be clear. Attention should be paid to the connection among the course components, such as lectures, practices and tutoring. Second, the courses in one education module should be logically interconnected with each other. Taking the specialty education module as an example, domestic and introduced courses should form an organic whole and the professional range of specialty should be appropriately extended on the basis of imparted key professional knowledge and skills. Third, courses should be distributed properly in the various education modules and the connection of educational modules should also be attached to the importance. Generally, there should be a connected, complementary and progressive relationship among knowledge and skills which are imparted through the general and transdisciplinary education modules with domestic courses as the main part as well as the specialty education module with both domestic and co-constructed courses as the main part.

Both the course introduction and the course integration need the support of two aspects, one is the close cooperation between domestic teachers and teachers of the partner university, the other is the functional support provided by the online teaching platform. The cooperation should cover the whole process from course preparation to implementation of teaching. This whole process of cooperation relies both on face-to-face communication and asynchronous communication on online teaching platforms. Carrying out teaching on online platforms is the manifestation of digital teaching, which plays an important role in the construction of the “online + offline” mixed teaching mode. As some researchers have said, digital technologies are considered as success factors for TNE (Caniglia *et al.*, 2017), curriculum reform of TNE should be combined with the digitalisation of education (Caniglia *et al.*, 2018). Among many online teaching platforms, Moodle platform is favoured by many TNHE programs. Relying on this platform, teachers can upload electronic course documents and video materials, answer questions, collect homework, conduct online tests and analyse students’ learning situations through platform data. Because the platform is equipped with the characteristics of “open source”, the plug-in can be updated and added according to teachers’ actual needs. With “in-depth cooperation between domestic teachers and teachers of the partner university” and “construction and function improvement of the online teaching platform” as two effective means, course introduction, course integration as well as the improvement of the curriculum system can be realised.

After the curriculum system has been preliminarily improved, it needs to be continuously refined. Therefore, feedback information should be collected during the

implementation of the curriculum system. By the time of the next round of the curriculum system revision, the feedback information will provide new enlightenments for course introduction and course integration. Through such a cyclic process, the TNHE Programs' curriculum system would be continuously improved.

Conclusions

In this paper, curriculum systems of TNHE programs in the major of computer engineering developed by seven ordinary universities and seven independent TNHE institutions are analysed and compared with each other. All TNHE programs aim at training international professionals. The analysis shows that independent TNHE institutions have more global educational resources and the practical experiences of curriculum construction can be implemented throughout at the university level, which leads to relatively high utilisation of course resources. In contrast, the curriculum system of ordinary TNHE programs puts forward higher requirements for credit points of English courses and major courses. It also tends to adopt the intensive English delivering mode. Although English courses and major courses are highlighted in form, the curriculum system does not fully reflect the goal of "cultivating professional talents with international vision" in essence, the interpretation of the concept of "internationalisation" is one-sided, focusing only on English proficiency, not on the all-round development of students. Moreover, some problems have arisen, such as introducing courses at the expense of raising high credit requirements, short-termed intensive teaching, lack of course integration. Those problems exert great academic pressure on students.

With regard to the issue of "improvement of TNHE programs' curriculum system", this paper holds that ordinary TNHE programs should learn from the educational philosophy of independent TNHE institutions and fully understand the importance of general education in cultivating students' core abilities, such as humanities accomplishment, scientific sense, team spirit, innovative consciousness and global vision. Doctrinairism and utilitarianism should be abandoned. Besides in the specialty education module, course introduction, course co-construction and cooperative teaching should also be carried out in the modules of general and interdisciplinary education, so as a good connection between curriculum modules could be made. In addition, relying on the online teaching platform, teachers of the two partner universities should make full use of their proactivity, try to avoid the phenomenon of overlapping and duplication of course content, pay equal attention to the integrity of the curriculum system and specialisation of major courses. Introduced courses, domestic courses and co-constructed cannot be simply piled up. Reorganisation and integration should be crucial concepts in terms of improvement of course content. On the basis of objective conditions, students' diversified study should be supported as much as possible. Some introduced courses could be open to the whole domestic university, in order to maximise the use of educational resources and improve the influence of TNHE programs at the university level. The above-expounded attempts will effectively improve the existing curriculum system of TNHE programs. After the implementation of the preliminarily improved curriculum system, new information should be collected as feedback data for the next round of improvement. In this way, a long-term mechanism for promoting the curriculum system would be established.

The development direction of TNHE in China has gradually changed from "quantity increasement" to "quality improvement". In order to gain new vitality, TNHE programs must lay stress on the connotation development. This paper holds that the principle of "introduction-integration-improvement-feedback-continuous improvement" should be

followed concerning the curriculum system improvement of TNHE programs.

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**BENDRŲJŲ MOKYMO PROGRAMŲ IR JŲ TOBULINIMO MECHANIZMŲ TYRIMAS
TARPTAUTINĖSE AUKŠTOSIOSE MOKYKLOSE****Jingyao Su, Jing Jiang****Santrauka**

Literatūroje, susijusioje su tarptautiniu aukštuoju mokslu (TAM), paprastai mokymo programos aptariamos makrolygmeniu teoriškai arba analizuojamas konkretaus kurso planas mikrolygmeniu. Šiame straipsnyje atliktas empirinis tyrimas ir išanalizuoti kelių Kinijos universitetų kompiuterių inžinerijos krypties TAM programų bendrieji mokymo dokumentai. Straipsnyje, taikant teksto analizę ir Vilkoksono rangų testą, tiriami reikšmingi TAM programų ir ne TAM programų mokymo sistemų skirtumai, įskaitant išsilavinimo tikslus, privalomų kreditų taškus ir kursų paskirstymą, konkrečiai aptariami mokymo programų ypatumai nepriklausomose TAM institucijose. Tyrimo metu sukurtas nuolatinio TAM studijų programų sistemos tobulinimo mechanizmas ir nustatyti trys bendrų studijų programų integravimo aspektai: veiksmingas įvestų kursų išteklių panaudojimas, bendrų kursų kūrimas ir kursų turinio sutrumpinimas. Integracija apima tris lygius – nuo tam tikro vieno kurso iki kurso modulių sujungimo. Dviejų universitetų partnerių dėstytojų bendradarbiavimas ir mokymo platformos internete kūrimas galėtų tapti mokymo programos tobulinimo priemone.

REIKŠMINIAI ŽODŽIAI: tarptautinis aukštasis mokslas, mokymo programos tobulinimas, kursų išteklių įvedimas, kursų integravimas.