Innovation of Bilingual Teaching in Packaging Engineering at Institution of Higher Learning Based upon Requirement of Quality Improvement and Connotative Development

Man-Ru CHEN\textsuperscript{a,}\textsuperscript{*}, Yu-Cong ZHAO\textsuperscript{b}, Gui-Fen GONG\textsuperscript{c}, Guo-Zhi LI\textsuperscript{d} and De-Qiang SUN\textsuperscript{e}

Dept. of Packaging Engineering, Shaanxi University of Science and Technology, Xi’An 710021, China

\textsuperscript{a}chenmr@sust.edu.cn, \textsuperscript{b}zhaoyucong@sust.edu.cn, \textsuperscript{c}gonggf@sust.edu.cn, \textsuperscript{d}liguozhi@sust.edu.cn, \textsuperscript{e}s_d_q@126.com

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**Abstract.** On the basis of comprehensively surveying the background and current situation of bilingual teaching implementation at institutions of higher learning, China, the distinct difference between bilingual courses and academic English for packaging in terms of bilingually educational model is clearly defined. It is emphasized that bilingual teaching in packaging engineering should protrude such kernel elements as packaging knowledge, and heighten the level of students who are able to apply foreign languages to carry on communications in discipline and specialty. In the meanwhile, the implementation of bilingual teaching ought to first and foremost be sustained, and how to foster the packaging professionals with international horizon and competitiveness is dwelled on. Ultimately, it is recommended that the innovative bilingual teaching model should be explored to accommodate the colleges and specialties concerned, inclusive of these key factors like teaching team, curriculum, teaching contents and resources, teaching means and methods, and the acceleration of the pace of course construction is taken as an important starting point and the connotative development of bilingual teaching is really implemented to elevate the quality of bilingual teaching in packaging engineering through deepening innovation of bilingual teaching.

**Introduction**

**Background.** To accommodate the development of international exchange, cooperation and competitiveness attributable to economic globalization, the excellent graduates who should well grasp the specialty knowledge and be familiar with how to use foreign language tool have to be cultivated to satisfy the needs of international talents in each specialized field. As early as 2001, the Ministry of Education, China, promulgated the No.4 document entitled Several Opinions on Strengthening Undergraduate Teaching Work to Improve Teaching Quality. It definitely stated that the conditions should be created to adopt the foreign languages, i.e., English, in teaching of both general courses and specialized courses for undergraduate education, and such specialties as biological technology and information technology, etc., which are in the high-tech areas, finance and law, etc., which are necessitated after China entered WTO should take one step further and taught courses in foreign languages should run up to 5%-10% of all the courses within three years. In 2003, there was an observation point in the appraisal index for evaluating the undergraduate teaching level of ordinary institutions of higher education issued by the Ministry of Education, China, that is pertinent to bilingual teaching. It definitely stipulated that the bilingual teaching referred to one that a non-linguistic course was directly instructed in a foreign language (typically, English), where the proportion of using English accounted for up to 50 percent of the total classroom hours for the non-linguistic course taught, exclusive of linguistic course. In other words, during teaching and learning of bilingual courses, the usage of English was at least up to a half in terms of spoken
English. In response to this, all the universities and colleges aggressively fulfilled the document and attached importance to and started up bilingual teaching, with the following exploration[1] of bilingual teaching goals, rules, means and model being launched

**Bilingual Teaching Demonstration Courses.** In 2007, the Ministry of Education, China proposed *Undergraduate Teaching Quality and Teaching Reform Project in China Colleges and Universities*, i.e., *Quality Engineering* for short, in which the Ministry demanded to push forward the bilingual course construction, encouraged to greatly proceed to bilingual teaching work and supported the returnees from overseas to teach the specialized courses in English so that English listening & speaking and integrated application & communication capacity in English were further intensified. It is well known that the implementation of bilingual teaching will enable the college students both to keep learning English in undergraduate phase and ensure the *mutual fusion, boost and increase of specialized knowledge and specialized English*. Moreover, with the addition of effective methods, bilingual teaching can give a strong impetus to students in participating in undergraduate study of their own accord in an atmosphere of English language, thus raising teaching effect and quality. In the same year, the Ministry of Education also undertook *Construction Projects on National Bilingual Teaching Demonstration Courses (CPNBTD)*. The CPNBTD courses were approved with advanced teaching concepts, emphasis on students’ cultivation of *international horizons and competitiveness ability*, and coincidence of teaching contents in disciplinary requirements, not under teaching criteria in Chinese. From 2007 to 2011, the 500 courses were approved as CPNBTD, in which bilingual courses of specialty accounted for 98%. These approval projects have led in the international forefront of knowledge, enriched contents of courses and enabled students to exposure to English context to ponder and probe into specialized knowledge, simultaneously experience the importance of linguistic tool for specialty study. These CPNBTD courses embody the teaching achievements of higher education in deepening innovation of bilingual teaching as well as fostering internationalization-oriented specialty talents, as such, playing a leading, demonstrating, driving and popularizing role in bilingual teaching throughout the whole China. From then onwards, both number and quality of bilingual courses set up at China universities and colleges have obviously risen. The distinct effect of bilingual teaching innovation has been acquired in that a large group of tip-top talents who were characterized by solid specialty knowledge, creative and active thinking, strong communication ability in foreign language and international horizons and competitive power were brought up for the country and society, thereby having made a positive contribution to deepening international exchange and cooperation of science and technology.

**Correct Understanding of Bilingual Teaching Connotation.** As shown above, bilingual teaching is defined as teaching of various disciplines and specialties in second language, or foreign language. On that account, bilingual teaching refers to non-linguistic disciplines and specialties’ teaching in non-mother tongue language, attaining the *synchronization of learning both English and specialized knowledge*. So bilingual teaching lays stress on *Contents, Communication, Cognition and Culture*, i.e., *4Cs* elements, among them *Contents* being a core. However, in bilingual teaching implementation, thanks to shortage of teachers, textbooks, teaching methods and students’ quality[2] , still more, unclear understanding of bilingual teaching, not aiming at students’ receptive competence, bilingual teaching courses became an academic English ones, and bilingual teaching went astray[3].

The traditional perception of bilingual teaching must be changed. Traditionally, *Bilingual Teaching* is different from that of *Academic English*. The latter, basically non-core courses of specialty, appears fragment, laying particular stress on such language points as grammas, terminology, expressions and translation, so to speak, being re-learning of foreign language combined with specialty. On the other hand, however, bilingual teaching, the required core courses of specialty, emphasizes systematic and logical knowledge. Therefore, attention is paid that it is inadvisable to abate educational quality of discipline and specialty for getting an isolated teaching of bilingual course in return.

Generally, bilingual course follows *College English*, but it is not a continuous one to learn foreign
language at all. The bilingual teaching brings about more opportunities to touch and practice English for the undergraduates, enables them to command English in the unconsciously influential way and to realize the transformation of Learning English to Using English, boosts the exchange and fusion of dual cultures or multiple cultures, impels the cultivation and increase of students’ English proficiency in terms of linguistic application and ultimately advances the internationalization of higher education in discipline and specialty.

Necessity of Continuously Practicing Bilingual Teaching in Packaging Engineering Education

Under the background of internationalization, in particular, the situation that China packaging industry is being transformed from a big packaging country to a strong packaging one has a pressing demand for packaging professionals. The internationalization requires the quality of packaging professionals on the three following points:

1. The packaging graduates should possess such capability as the rapid retrieval and reading of English literatures on packaging. The development of packaging, as an industrial technology, has closely been related to social progress. It is well known that the first School of Packaging in the world was founded at Michigan State University, USA in 1952. With reference to its schooling model, China commenced her packaging engineering education at the beginning of 1980s. Up till now, over 70 ordinary institutions of higher learning have created the undergraduate specialties in packaging, the majority of which are the provincial universities and colleges. Later on, as an interdisciplinary specialty, packaging engineering has found a rapid growth. Meanwhile, taking the whole world in view, it is no doubt that the American packaging science and technology level has been known as the most advanced one. That is to say, the first-hand packaging materials are nearly ones in English. For this reason, schooling in packaging engineering has got more international commonality in that there are more fixed nomenclature, meanings and glossary; the understanding and interpretation of specialized knowledge in diverse languages are also consistent. It will be easy for the packaging graduates to take part in the global packaging science and technology as well as international exchange. Therefore, it will be very vital to pursue bilingual education in packaging engineering. Bilingual teaching can train packaging professionals who directly trace the international forefront, both duly and precisely seize the packaging markets, technological development and international packaging laws & regulations, etc..

2. Packaging graduates ought to possess the fluent oral presentation and communication ability in English so that there is no difficulty in oral communication while they work along with the foreign packaging associates in the trans-national packaging corporations.

3. Packaging graduates should possess more precise communication ability in writing. They can write the written materials, such as the academic articles and research paper on packaging, especially, own technological and experimental reports in which they gets involved.

At present, most of the graduates have had some linguistic basis through learning foreign language, however, in fact, those who can both command more solid specialized knowledge and better communication in English applicable to international talents have not yet satisfied the need of strategy of stronger China in packaging engineering.

Main Considerations for Connotative Construction of Bilingual Teaching in Packaging Specialty

As mentioned above, bilingual education consolidated in packaging engineering enables packaging courses to keep up with the world, and corresponding curriculum system and teaching resources are almost the same as the well-known universities’ ones in the world. On the other hand, standardization of some emphasis courses and their teaching will play a very important demonstration and leading role for other courses and teaching of specialty. Therefore, fostering international packaging professionals ought to strengthen the construction of bilingual teaching as
the breakthrough point. For this purpose, the construction of bilingual teaching should place more stress on teaching model, inclusive of bilingual teachers, curriculum set-up, contents and textbooks, etc.

**Bilingual Teachers.** The bilingual teachers have been referred to as a big bottleneck. They must not only be equipped with the qualified English proficiency, but have a good grasp of specialty knowledge to adequately rein class. The bilingual teachers are trained and developed through employing the foreign packaging professors for training, or being sent abroad and to the domestic English training institutions to improve their listening and speaking comprehension as well as bilingual teaching skills.

**Curriculum.** It is generally inappropriate to teach the bilingual courses, just following *College English*, in particular, for those provincial universities, in which the undergraduates are characterized by the uneven English proficiency on the whole, and limited listening and speaking comprehension, thus having an impediment to bilingual teaching. Hence, it will be effective to add an *academic English*[4] as a *bridge course*, a *transitional one*, for the subsequent bilingual course group. The bilingual course setting and curriculum system are shown in Fig.1.

![Figure 1. Bilingual course setting and curriculum system in packaging engineering.](image)

Where CE means College English; AE, Academic English for packaging; BC, Basic Course of specialty, e.g., Packaging Fundamentals; CC, Core Courses of specialty, e.g., Packaging Materials, Packaging Structures, Transport Packaging, Food Packaging, Packaging Technology and Machinery.

**Textbooks.** Bilingual books are the carrier of bilingual course construction. The selection of proper books is a vital role in the improvement of bilingual teaching quality. The textbooks for bilingual courses should be the original books[5] of English-speaking countries in that they are featured by the original and native English, many case studies, state of the art information on packaging and universality globally. However, these books are typically costly, to some extent, lack some pertinences for the Chinese counterparts. So it is recommended that the selections and integration of the original books are carried on to localize the books[6,7] that are attached some notes in Chinese and English-Chinese Glossary[8].

**Teaching Methods.** Traditionally, teaching method is translating passages sentence by sentence while reading passages so that bilingual class becomes academic English one. This situation is that students’ ability has seldom made a progress in learning discipline and specialty through a foreign language, consequently not attaining the primary objective of bilingual teaching. For this reason, in any engineering specialty of China universities and colleges, it is inadvisable to merely teach specialty courses in *English* in place of the counterparts in *Chinese*. On the contrary, the instructors are required to actively adjust teaching means and methods, probe into the new bilingual teaching model fitted to training the professionals with the international competitiveness. The current teaching models are as follows: Immersion[9,10], Maintenance[11], Transitional[12], etc. These methods can be flexibly put to use in line with the practical features of students. For instance, for *bilingual basis courses of specialty*, a *Collaborative/Inquiry method* was applied. That is, it brought about a transformation of *Inquiry* with students being a main body from *Preaching* with teachers being a leading factor; students became the active learners from the passive ones; students gradually were keenly aware of the development and frontier on specialty all over the world; students were fully acquainted with the tremendous information resource acquired with the help of foreign languages. Hence, students’ strong interests in learning and investigation of specialty can be aroused with a foreign language as a tool while their self-study and creative ability can be come into being. On the other hand, for *bilingual core courses of specialty*, a *Alternate method* tried to be used. That is, the lecturers adopted *Chinese* to teach core courses of specialty so that students were able to apprehend
specialized knowledge as a whole, at the same time, they chose some of new original materials as handouts, or a chapter, a section to instruct them in English on the basis of full preparation of class, thus infiltrating the advanced knowledge on specialty, key packaging terms and words in the normal teaching and increasing the substantial results of bilingual teaching.

Grading. The requirements on assessment should not be under ones for the corresponding course in Chinese prescribed by the syllabus. The total points consist of the continuously assessed and the final exam. Besides, to further strengthen the teaching effect and pertinence of bilingual course, a questionnaire was carried out when the course ended. This questionnaire, actually an evaluation system in terms of three indexes (i.e., textbook, lecturing and effect) with 10 observation points, had been developed.

Conclusion

For all of the specialties, especially, engineering specialties of China universities and colleges, the bilingual teaching is fully implemented as an entry point in the process of higher education towards internationalization. However, the actual effects in bilingual teaching are different from the different universities and colleges. The bilingual teaching quality at the first-class colleges can be pledged in that they have got the adequate teachers and better students’ quality. The bilingual teaching quality at the regional colleges is less than satisfactory because of some limitation in the conditions of offering bilingual teaching.

Packaging is one of the younger interdisciplinary engineering educations in which there have been more than 70 universities and colleges enrolled undergraduates, among which non-211 local ordinary institutions of higher learning account for the majority. In addition, both the advanced packaging engineering technology and higher packaging education originated in speaking-English countries, which clearly stated that the packaging professionals nurtured by these colleges will certainly have to participate in international academic exchange and rivalry. So the fact that education should be open in terms of international thoughts and orientation is a trend. It requires packaging engineering specialty take the lead in having more and better bilingual courses.

Then, how is bilingual teaching carried on at non-211 provincial universities and colleges combined with their own reality? In this paper, the authors present the teaching model developed. Namely, when the system of bilingual courses are set, a transition of college English and bilingual courses on specialty needs to be well dealt with. The first bilingual course of specialty should be the introductory one. In teaching the bilingual core courses of specialty, the Alternate method in Chinese and English should be proceeded to in accordance with students’ foreign proficiency and acceptance, and the Collaborative/Inquiry method ought to run through and better questions-answer and tutorials in out-of-class study.

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References


