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## ACQUISITION OF TECHNICAL VOCABULARY AND SHIPBUILDING TERMINOLOGY IN CHINESE DIDACTIC ENVIRONMENT

ИЗУЧЕНИЕ ОБЩЕТЕХНИЧЕСКОЙ И СУДОСТРОИТЕЛЬНОЙ  
ТЕРМИНОЛОГИИ В КИТАЙСКОЯЗЫЧНОЙ ДИДАКТИЧЕСКОЙ СРЕДЕ

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**Abstract.** Didactic problems dealing with mastering English scientific and shipbuilding terminology by Chinese students have been studied. The study deals with a particular issue of rendering educational services in English as an intermediary language in the Chinese teaching environment. This issue mainly concerns the improvement of teaching process through the development of methodological materials for mastering the fundamental terminology of ship-building in the foreign language environment. The key principle for our terminological array selection was based on the intelligible assumption: due to the extension of integration processes of science and technology development and globalization intensification, that are both reflected in the languages of our everyday life, the main attention is to be paid to the mastering of specialized terminology, that of shipbuilding theory and practice fundamentals. It logically resulted in devoting less preference to the general scientific notions and terms as the latter are easily conceived as 'internationalisms' in almost all European languages. To substantiate such an assumption we relied on general ways of assimilation in Chinese of the so called 'internationalisms' and borrowings from English. In order to prove the validity of this obvious approach we had attempted a brief experiment which demonstrated complete inconsistency of our approach. Thus, the data obtained allow us to solve the above-indicated problem of CLIL teaching in Chinese didactic environment.

**Keywords:** English borrowings; shipbuilding terminology; Content and Language Integrated Learning (CLIL); lexicographic support.

**Аннотация.** Рассмотрены вопросы усвоения студентами общенаучной и специальной технической терминологии в условиях китайскоязычной дидактической среды. Предложена методика подготовки учебных материалов для повышения качества учебного процесса в среде китайских судостроительных колледжей и ВНЗ.

**Ключевые слова:** английские заимствования; судостроительная терминология; интегрированное изучение иностранного языка на материале содержания специальных дисциплин (CLIL); лексикографическая поддержка.

**Анотація.** Розглянуто питання засвоєння студентами загальнонаукової і спеціальної технічної термінології в умовах китайськомовного дидактичного середовища. Запропоновано методику підготовки навчальних матеріалів для підвищення якості навчального процесу в середовищі китайських суднобудівних коледжів і ВНЗ.

**Ключові слова:** англійські запозичення; суднобудівна термінологія; інтегроване вивчення іноземної мови на матеріалі змісту спеціальних дисциплін (CLIL); лексикографічна підтримка.

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**Problem statement.** Among the methods used were the descriptive technique aimed at explication of notions and terms meaning, the comparative analysis of the principal terms and their equivalents between the intermediary language and the mother tongue, and observation method of foreign borrowings in science terminology DB in Chinese with systematization and classification of English shipbuilding terms and their Chinese equivalents. The study concerns the improvement of teaching process through the development of methodological materials for mastering fundamental terminology of shipbuilding in the foreign language environment.

The assumption of the research: due to the extension of integration processes of science and technology development as well as globalization intensification, that are both reflected in the languages of our everyday life, the main attention is to be paid to mastering specialized terminology, i.e. shipbuilding theory and practice fundamentals teaching in Chinese didactic environment.

**Latest research and publications analysis.** One of the answers to this challenge could be searched in the experience of teaching English for specific purposes (ESP). It's obvious that ESP program is integrated into the main subject matter of the students. It is aimed at learning the language in order to master a set of professional skills so as to carry on their future professional responsibilities efficiently. But in our case the first year college students' habits and skills of communicating in English are rather superfluous. Practically they are at the level of false beginners. That means that the students would not be able to improve their knowledge of language using it in their everyday production or design practice. Naturally, it is a teacher's task to create the didactic situation which is as close to the nature of their job functions as possible. But the real classroom environment shows insufficiency of this approach alone. And here we can make use of the experience of Content and Language Integrated Learning (CLIL) teaching which has been initiated within the European Union educational programs recently [1, 5].

**THE ARTICLE AIM** is at the improvement of foreign language teaching techniques through studying a number of subjects by means of an intermediary language.

**Basic material.** In case under consideration it is the English language that is used as an intermediary in teaching and learning non-linguistic context. It unites two objectives: studying the subject matter contents and, simultaneously, mastering the foreign language. This approach has been successfully realized in the situations where a number of disciplines is taught in a foreign language.

In connection with the above-indicated it becomes clear that the requirement to the instructor of any engineering subject delivered in English for foreign students can be summed up by two points: 1) proficiency in spoken English and 2) knowledge of the vocabulary of related technical subject and terminological database of the subject taught.

To arrange the lexicographic support of the second point we have made an attempt to develop a manual for reading specialized literature on shipbuilding comprising short texts from fundamental disciplines of general ship design and construction. The examples of reading formulas, symbols and expressions of principal sections of mathematics as well as basic notions of physics have been included. As is known the majority of this vocabulary was formed on the basis of the words of Greek and Latin origin and constituted an international lexis layer for most European languages.

To prove the validity of the above hypothesis we had to carry out the following two steps in our study. The first was to investigate the typical types of borrowing from other languages into Chinese, and then, on the basis of quantitative research of general scientific and technical terms as well as specialized terminology of shipbuilding, come to the didactic conclusion on the ways of effective presentation and mastering of this terminology. The suggested solution to this challenge has been achieved in result of one of the author's professional experience of teaching shipbuilding for Chinese students in 2013–2014 at the admiral Makarov National University

of Shipbuilding (Ukraine) and Zheijang Maritime College (People's Republic of China).

As is known [5], Modern Chinese (putunhua) comprises a number of the following types of borrowings: 1) phonetic; 2) semantic; 3) phonetic and semantic; 4) phonetic borrowing + gender word; 5) literal borrowing.

First borrowings came from English and Japanese. And at first they were introduced into Chinese with the help of phonetic means. It implied the transfer of sound imitative expression of a foreign element. For example: 开麦拉, *kāimàilā* (from English camera), 巴力门, *bālímé* (from English Parliament), 盘尼西林 *pánixīlín* (Penicilin). But, as Chinese language experts state, such borrowings are aliens and sound unnatural in the language of isolating type which is the case with Chinese. Therefore the process of their assimilation is rather complicated. Many words are borrowed by semantic means [2: 192–193]. This technique implies the translation of a foreign word into Chinese. They are made up by Chinese lexical components and thus bear no phonetic resemblance of a foreign word as well as their graphic forms. E. g. 电话 *diànhuà*-*phone* («electricity» + «speech»).

The next two hybrid techniques of borrowings are semantic-phonetic, e. g. 因特网 *yīntèwǎng*-*Internet* where the first copies the phonetic form and the second is a Chinese translation. The second hybrid technique is a phonetic borrowing plus generic (class) word. The first one has an element which resembles the borrowed word but the second component is a Chinese class word, e. g. 坦克车 *tǎnkèchē* *танк* (Engl. tank + 车 «transport means»). The literal borrowing concerns borrowed abbreviations and has nothing to do with our topic.

In formulating our hypothesis we relied upon the four of the above-indicated ways of borrowings, i.e. phonetic, phonetic and semantic, phonetic borrowing + gender word and literal borrowings. And the basis of our hypothesis lies in the assumption that the Chinese language preserves the phonic resemblance (with different degrees) of the borrowed words. The exception was the second type — a semantic one, where assimilated borrowings would possess neither phonetic nor literal similarity, and the least numerous — a literal one.

Practical teaching of shipbuilding fundamentals in the Chinese language environment demonstrated that the easy recognition of such 'internationalisms' has put forward a real problem that could be neither avoided nor omitted.

To be certain that this is typical to all technical terminology in Chinese language today, we have attempted a brief experiment. It implied the following verification technique. First, we have picked up the most spread notions and terms of European paradigm of knowledge and thinking, using thesaurus index of main word groups as well as technological and scientific word layers from

the most representative corpora linguistics samples. Then we provided each lexical unit with Pin-in phonetizing symbols to demonstrate its sounding in Chinese and verify whether such units belong to what is called 'internationalism' and could be clearly understood as an equivalent or it does not.

Hereinafter the examples referred to are arranged as two columns: words in English and in Chinese Pin-in phonetizing system:

#### General notions of physics and maths:

English	Pin-in
diameter	zhǐjìng
radius	bànjìng
area	qūyù
period	shíqī
acceleration	cùjìn
speed	sùdù
gravitation	wànyòuyǐnlì
mass	kuài
normal	zhèngcháng
elasticity	tánxìng
stress	yìnglì
energy	néngyuán
coefficient	xìshù
factor	yīnsù

#### Names of materials, states of substance

aluminium	lǚ
magnesium	měi
copper	tóng
bronze	qīngtóng
metal	jīnshǔ
gas	qì
liquid	yètǐ

#### Nuclear physics, names of sciences

Ion	lízǐ
proton	zhìzǐ
electron	diànzǐ
nucleus	hé
physics	wùlǐ
chemistry	huàxué
mathematics	shùxué
biology	shēngwù xué
botany	zhíwù xué
ornithology	niǎolèi xué
medicine	yīyào
insectology	kūnchóng xué
astronomy	tiānwénxué
literature	wénxué
logics	luójí

*Technical terms*

engine	fādòngjī
cylinder	qìgāng
piston	huósāi
pump	bèng
turbine	wōlún
machinery	jīxiè
rotor	zhuànzǐ
stator	dìngzǐ
transformer	biànyāqì
condenser	jù guāng qì
refrigerator	bīngxiāng
boiler	guōlú
propeller	luóxuánjiǎng
propulsion	dòngli
yacht	yóutǐng
container ship	jízhuāngxiāng chuán
tanker	tanker
tweendeck	Èr céng jiǎbǎn

The above-indicated examples give us direct reply to the question put forward in the beginning of our study. With very few exceptions, such as ‘tanker’, ‘yacht’, and ‘logics’ which vary in Chinese pronunciation from full (tanker) to partial assimilation (‘yacht’, ‘logics’) the remaining 54 terms from the array constituted a little less than 97%.

Thus, the leading way of borrowings, a semantic one, results in the fact that while introducing technical texts with inter-national lexis we can not expect their understanding by Chinese learners, as is typical for the most European languages of various language subgroups. And the task of a CLIL teacher is not to ignore such words

of general science and technical vocabulary as the ones that do not cause difficulties of understanding, but deal with them equally as with ‘new’ words. The obtained data helped us to substantially alter the structure of our first edition manual [3] and adapt it for Chinese learners of shipbuilding fundamentals, especially the glossaries to the chapters and lexical exercises aimed at elimination difficulties of newly introduced lexical material preceding the texts. The widespread ‘internationalisms’ and English borrowings of the language of science and technology (with insufficient exceptions) were dealt with as absolutely new words. In some cases they were provided with Chinese equivalents where class-room speech exercises were a priority. The didactic material can be equally useful for both the target classroom, i.e. for foreign students studying at our university, and for instructors performing educational process. The research can be also used for further study of borrowings and their assimilation in Chinese from the viewpoint of etymology and sociolinguistics where far reaching conclusions can be traced by a very short reference to three different words existence (cosmonaut, astronaut and taikonaut) meaning the same in Russian, English and Chinese.

**CONCLUSIONS.** Since our linguistic experiment didn’t prove our primary assumption which meant devoting less preference to the general scientific notions and borrowed terms, we may come to the conclusion that in the Chinese didactic environment, while introducing widespread scientific and shipbuilding terms, we have to keep in mind that the latter are to be dealt with as absolutely unknown lexis for Chinese students. That means that. Specially aimed exercises have to be provided prior to reading principal teaching materials such as texts, in order to eliminate lexical and semantic difficulties in the classroom.

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