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JAPANESE LANGUAGE TEACHING FOR ENGINEERING STUDENT
-KANJI SYLLABUS TOWARDS EFFICIENT READING-

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I ABSTRACT

It is said that kanji (Chinese characters) are a barrier for non-kanji country students when they are to read Japanese written materials. However, in our survey we found that an essential 100 kanji characters cover 65%, and 200 characters cover 80% of materials occurring within each specialty of an engineering or science department. Furthermore, within each speciality many kanji are used in a limited number of ways. Thus, the time required for learning kanji can be reduced with a syllabus tailored to each student's needs. This paper presents statistical results of a survey on the frequency of Kanji usage among various specialities.

II INSTRUCTION

For various reasons, mastery of Japanese within a particular specialty is essential for large numbers of engineering students. Many students believe that they must learn a given number of kanji in order to read their material, which presents a large initial barrier. However, this barrier may be circumvented by concentrating on the kanji and kanji compounds most necessary for their specialty.

III DETAILS AND RESULTS OF SURVEY

1. Frequency of kanji in technical and scientific textbooks

For this purpose, we surveyed 16 scientific and technical textbooks that the students must to read for their research activity. There are 2,001 different kanji in this corpus. Single kanji frequencies of 16 texts were surveyed in this corpus by KJC software.(This program was developed by a Phd student under Ptof. Akiba at T.I.T who cooperated with our project.) Output data of the kanji are shown as in the following Table 1. We found that the textbooks used in mathematics and circuit theory use less kanji than those in biology.

2. Frequency of kango(kanji compound words) in scientific and technical textbooks

In this section, we analyze how Kanji are combined into compound words (kango) in scientific and technical textbooks. We selected the 500 most common Kanji across all fields as established in Sec.1. We selected 6 of the 16 textbooks, from mathematics(bibun sekibun-gaku), physics(buturi-gaku), electrical engineering(kairo riron), chemistry (kagaku),

biology(bunshi seibutugaku), and oceanology(umi no kagaku). For extracting kanji compound words, we developed a program which uses JUMAN software, developed by Prof.Nagao Makoto Laboratory at Kyoto University. After using this program, we obtained the following results . We found that some technical terms are very important in certain fields but not seen in other fields. For example,<遺伝子 idenshi;gene> has frequency of 106,and <染色体 senshokutai;chromosome> occurs 100 times in [Seibutu], but not at all in the other textbooks.

IV CONCLUSIONS

In most engineering specialties, the distribution of frequencies of Kanji occurring in reading materials is such that an effective teaching strategy can be designed by concentrating on the most frequent Kanji and Kanji compounds. This will enable them to make the most rapid progress in obtaining their goal, which is mastering communication about their given speciality.The following table shows the distribution of frequencies of single kanji cover a variety of speciality-oriented texts. Most important is the covering ratio, which shows what percent of total occurrences is covered by the most frequently occurring 100 and 200 kanji characters respectively.

References

(1)Kikuko Nishina 1993 Report on Development of Teaching Materials for Technical Japanese supported by Ministry of Education , Science and Sports 1992～1994

Table1 Covering ratio of 16textbooks

	<1> title of texts	<2>total number of letters	<3>total number of kanji	<4>total number of different kanji	<5> covering ratio at 100th of kanji order list	<6> covering ratio at 200th of kanji order list
①	Mathematics(1)	75068	16642	(1)332	87.5	98.3
②	Circuit(1)	46309	11573	(2)393	82.0	95.9
③	Mathematics(2)	76178	20320	(3)511	79.8	93.8
④	Mathematics(3)	118640	26662	(4)532	78.7	93.1
⑤	Circuit(2)	86847	22621	(5)646	74.2	89.8
⑥	Drawing	94706	32292	(6)654	82.1	93.2
⑦	Chemistry	60678	19919	(7)689	69.3	86.1
⑧	Physics	71673	22121	(8)805	64.8	81.9
⑨	Fluid Dynamics	81504	27253	(9)838	65.8	83.7
⑩	Chemistry(2)	87254	22880	(10)853	63.8	80.6
⑪	Oceanlogy	48848	17056	(11)913	58.4	76.3
⑫	Biology(1)	116110	25327	(12)926	64.6	81.4
⑬	Biology(2)	89296	29389	(13)948	61.4	78.4
⑭	Geometry	92750	29942	(14)1018	57.8	76.6
⑯	Environment	89296	30883	(16)1485	58.5	66.2
	all texts	1304112	384225	2001	50.1	69.9
	average	81507	24014	804	65.5	79.7