

# Transcribing Texts for Mainstreamed Blind Students in a Foreign Language Class

*Beate Luo\**

## **Abstract**

Students with blindness need to have braille versions of any kind of text that is used in class. In addition to the Chinese books available here in Taiwan, there do exist several textbooks for English and Japanese foreign language instruction, in braille. But in the case of German or any other foreign language it is difficult to find someone who is able to do the transcribing. This paper wants, therefore, to show how the transcribing is done in an effective way. First, an introduction to braille is given in order to provide a better understanding of the problems that arise with the transcribing of texts to braille. Afterwards, the problems that appear in the transcribing process are demonstrated and solutions given with examples of how the original text of a textbook for German as a foreign language was transcribed into braille. The transcribing process of the German textbook resulted in a number of rules that were set up to serve as a reference for anybody who needs to transcribe texts for students with blindness.

**Keywords:** blindness, mainstreaming, braille, special education, foreign language

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\*Associate Professor, Foreign Languages and Literature Teaching Section, Feng Chia University.

## I. Introduction

Mainstreaming students with visual impairments has been practiced in Taiwan since 1966 (Wang, no year). Thus, the experience of having a student with blindness in the classroom is something that could happen to any instructor at any kind of school or university. Therefore, I want to share my experiences as I believe that it may be helpful for anyone who gets into the same situation: Two weeks before the new semester started, I was informed that there would be a blind student in my “German as a second foreign language” class. I was told that there weren’t any textbooks for German in braille available in Taiwan and no organization that would be able to transcribe the textbook. Thus, transcribing the textbook I was going to use in class became the biggest problem.

Although the Resource Center for Blind and Visually Impaired Students at Tamkang University publishes all kinds of textbooks, in Chinese as well as foreign language textbooks for English and Japanese, they didn’t have any textbooks for German. The publications available there can be found at: <http://www.tkblind.tku.edu.tw>. Unfortunately, transcribing texts into braille is time consuming. Consequently, if a textbook needs to be transcribed, it must be sent in well before the beginning of the course. In addition, if the text is written in a language other than Chinese, English, or Japanese, it should first be determined whether the transcribing can be done at all. However, even in the case of Chinese or English, for handouts, it might well be of interest to see what transcriptions for braille should look like in order to be able to do it yourself. This might prove to be faster and may be the only alternative if time is limited. In conclusion, the purpose of this paper is especially to give those teachers who have only little or no background knowledge in special education the necessary information on how to deal with the problems arising with the transcription of texts into braille<sup>1</sup>.

To better understand the problems of transcription, an introduction to braille will be given first, before the problems of rearranging texts will be addressed.

## II. Introduction to braille

Braille is a system of reading and writing for people with visual impairment

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<sup>1</sup>Although there is quite a large amount of publications on problems dealing with mainstreaming of students with visual impairments in Taiwan, I couldn’t find any related to the problems of transcribing

which uses raised dots. These dots represent the letters of the alphabet, punctuation marks, numbers, and provides symbols to show their grouping. The basic unit of braille is the braille cell, which consists of two columns of three dots each. The dots within the cells are numbered as follows:

dot 1 ●● dot 4  
 dot 2 ●● dot 5  
 dot 3 ●● dot 6

From these six dots 64 possible combinations, including the blank cell with no raised dots, can be derived. Fig. 1 shows the simplest designated meanings for each cell as they are used in English braille. Braille is defined for many different languages, for musical notations, as well as for mathematics and scientific notations. An introduction to these notations as well as to Chinese, English, Japanese and German braille is given by the Ministry of Education (2000).

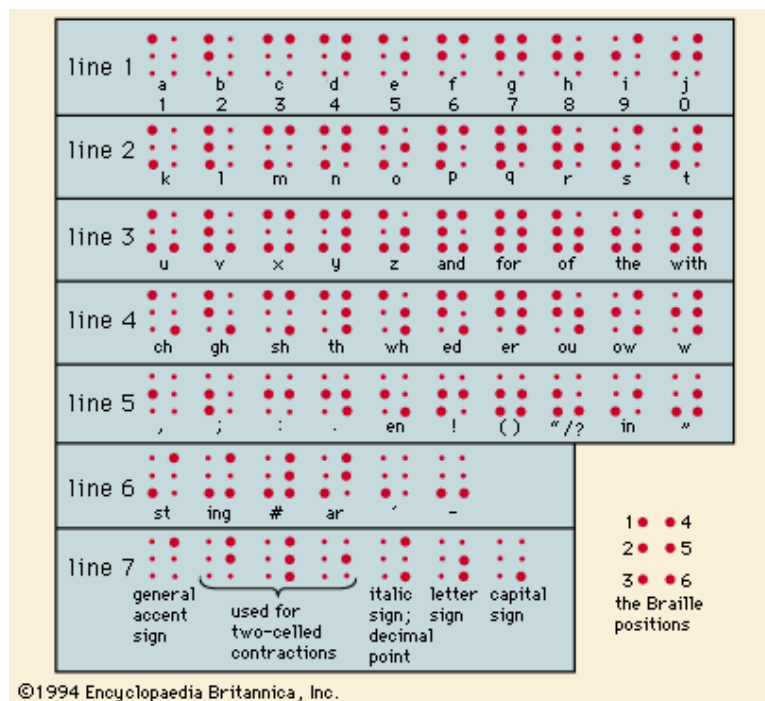


Fig. 1: Formation of cells in English braille  
 (<http://www.britannica.com/eb/art?id=6927&type=I>)

Using dots 1, 2, 4, and 5 the first ten letters of the alphabet are formed. Putting the numeric indicator # consisting of dots 3, 4, 5, and 6 (line 6, fig. 1) in front of the

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texts. But this might be due to my limited knowledge of written Chinese.

letters “a” through “j” results in the numbers 1 through 0 (line 1, fig. 1). By adding dot 3 to the signs in line 1 the letters “k” through “t” are produced. When dots 3 and 6 or dot 6 alone are added to the first ten letters, the remaining letters of the alphabet, five very common words and nine common letter combinations are formed (line 3 and 4, fig. 1). A braille letter is supposed to be in lower case. By putting the capitalization indicator (dot 6, see line 7, fig.1) in front of a letter the letter is changed to uppercase. Putting two capitalization indicators in front of a word results in an uppercase word.

German braille is very similar to the English version in regard to the transcriptions of the letters a through z (fig. 2). But differences exist as German has some letters that do not exist in English and some combinations of letters that are found in English do not exist in German (e.g. “wh”) while others are written differently (e.g. “sh” and “sch”). Consequently, the sign for “the” in English results in the sign for “ß” in German while the German “sch” would translate to “wh” in English.

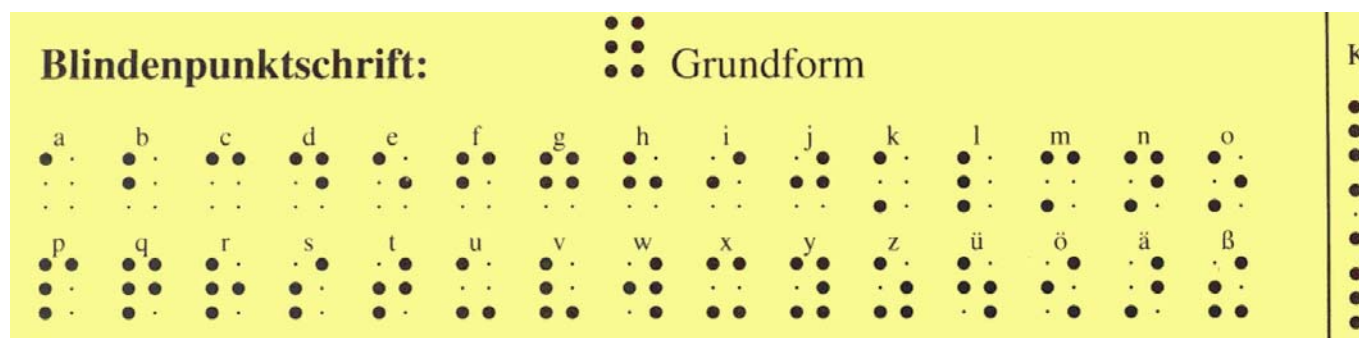


Fig. 2: German braille (<http://www.braille.at/blischri.htm> )

Other languages differ in a similar way from English braille. This has, therefore, to be kept in mind when transcribing texts in languages other than English as students learn English braille already in junior high or, in the near future, even in elementary school. So they are already quite familiar with English braille when they enter higher education.

The dots of braille need to be of a certain size. If they were too small, it would be impossible to distinguish the different patterns. Therefore, braille writings are very bulky. One page of inkprint on A4 size paper translates into about four pages of braille on B5. To reduce the bulkiness of braille a lot of contractions using one or more cells have been developed in addition to those in line 3-6 (fig. 1). For instance, the braille symbol for the letter “k” stands for the letter “k” only when it is in contact with other letters within a word. If it stands alone between two blank cells or a blank cell and a punctuation on either side “k” stands for “knowledge”. Likewise, the letter “d” is a contraction for the word “do” if it is not in contact with other letters. Adding dot 5

before the sign of the letter “d” represents the word “day”. Texts using none of these contractions are called grade 1. Here, capitalization, numbers, and punctuation are represented with the correct braille symbol.

Grade 2 texts use various contractions and are the most commonly used. Saving of space in comparison to grade 1 is about 20 % (Durre, 1996). But, as can be seen in fig. 3, even though each word, except for “a”, in that sentence uses a contraction, the braille printing is still larger than the already large inkprint version of the same sentence. Hence, even when using grade 2 one page of an inkprint will equal to about three braille pages.

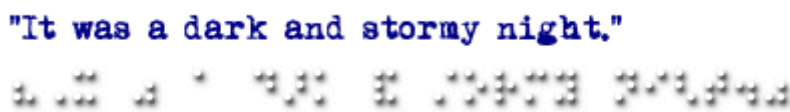


Fig 3: Example of braille grade 2 writing (<http://www.brailier.com/shop.htm> )

As braille has its own rules for formatting, spelling, and punctuation, translation software is needed to change a text file into a braille file. For printing such a file, a braille embosser has to be connected to one of the computer’s printer ports. The printing is done by embossing the cells in horizontal lines from left to right. The text is read by moving, usually the index finger, over these lines. The reading speed of a person with blindness is highly related to the age of onset of blindness (Sampaio and Philip, 1995; Trent and Truan, 1997) but variations depend as well on the purpose of the reading task (Knowlton and Wetzel, 1996). Expert braille readers use both hands for scanning which enables them to increase their reading speed substantially (Davidson *et al.*, 1992; Simón *et al.*, 1996). However, the average reading speed even of an expert reader is much lower than the reading speed for a sighted person (review given by Denninghaus and Hupfeld, 1987) as the identification of written characters by touch takes more time than by sight (Simón and Huertas, 1998).

Writing braille can be done using a slate and a stylus, a typewriter or a computer. The slate consists of a board and a grid. Paper is inserted between these two, thereby splitting the paper into small rectangular cells and the stylus is then used to create the dots. Because the dots are made from the underside of the paper, writers begin at the right side of the page and end the line on the left. The words are written mirror-inverted, because the paper has to be turned around for reading. Both, using slate and stylus or typewriter have the big disadvantage that only people with knowledge of braille are able to read the texts. A computer, on the contrary, can be

combined with a refreshable braille display (or braille line) and an embosser to enable the reading of text in inkprint as well as in braille.

### III. Formatting of texts

#### A. Use of symbols

Although contractions can reduce the bulkiness of a braille text, when starting to learn a foreign language, grade 1 is preferable as contractions complicate the learnability of the target language. Furthermore, for languages that have a more phonetically oriented writing system, like Italian, Spanish, or German for example, grade 1 writings can help students to recognize the pronunciation of the words. In my opinion, grade 2 should, therefore, not be introduced before, at least, an intermediate level has been reached so that the students are familiar with the spelling and have already acquired a substantial vocabulary in that language.

This might be seen differently if a person with blindness is living in a foreign country where, of course, most written material will be available only in grade 2. In this case, the ability to read will be severely limited due to a lack of knowledge of contracted braille. Writing using conventional print is, however, facilitated if grade 1 has been learned prior to going to that foreign country (Guinan, 1997). But this is a special situation that won't be found very often here in Taiwan and with which the students can deal when going abroad. In general, students will attend a foreign language class as part of their curriculum and the teaching of grade 2 should, therefore, be left to the higher levels of instruction, which at present are reached only at university level in the case of English. Here, it is then the task of the teacher or the resource teacher – if there is one – to find textbooks written in grade 2. The above mentioned Resource Center for Blind and Visual Impaired Students at Tamkang University or the Teachers' Training Program for Visually Impaired Students of National Tainan Normal Teachers College, to give some examples, should be able to produce them. But with the introduction of second foreign language instruction at high school, the introduction of grade 2 of other languages at university level may as well become necessary in the future.

One problem that teachers face in Taiwan, when transcribing foreign language texts is the complicatedness of Chinese characters and the amount of homophones in the Chinese language. This results in a totally different system for Chinese braille and renders the use of computer software for transcriptions, developed in other countries,

useless (see Huang, 1993; Ke, 1993). The program available here is not defined for languages other than Chinese and English. Although translation programs for other languages can be purchased from abroad this is, as well, a cost factor. The number of mainstreamed students with visual impairments at one school is normally not very high so that the school, whether high school, university, or any other kind of institution, might not be willing to purchase such a program.

Another problem is that none of the programs is able to translate texts into braille that consist of the foreign language in question and a Chinese translation, as in the case of a glossary, for example. Furthermore, the student is unable to write a text using both languages. This could be useful, for instance, when doing a translation exercise or when the student wants to write some comments or some explanations in Chinese next to a sentence or a paragraph in the target language.

For a blind person it wouldn't be a problem to learn the differences in the alphabet of, for example, German, but the program used here in Taiwan would translate the German braille to an inkprint version that uses the transcription rules for English, resulting in quite a lot of misspellings. Thus, for a sighted person the text would become difficult to decipher even if the braille display would be correct in German. This is due to the differences in the codification of letter combinations or common words in the two languages (see fig. 1 and 2). The following example may clarify this:

braille display:	Wenn ich Zeit hätte, würde ich euch schreiben.
inkprint:	Wenn ith Zsht hartte wourde ith ghth whrshben.

Even for someone without any knowledge of German it is obvious that this might not be easy to understand. Therefore, I transcribed all texts using the English braille version and applying the official rule for the replacement of the letters "ä", "ö", "ü" and "ß" by "ae", "oe", "ue", and "ss". At the same time I provided my student with a version of the German braille system in order to make her aware of these differences.

## B. Problems arising from the layout and solutions

In an inkprint version the layout of the text is done for visual effect. It is designed to please the eyes. But for a blind reader the design of an inkprint version may be very difficult to understand. The following example of a layout may give you an idea:

Writing the text in a column may be very useful to make certain aspects clearer for a sighted reader

but the blind reader may miss a relevant part of the text by assuming that there is nothing else written in that line if the number of empty spaces between columns is too large and the text in the column at the left is meaningful.

Consequently, the use of columns should be avoided as much as possible and if there is no alternative found, the spaces between the columns should be kept as small as possible. Regardless, there should be a notice for the student to inform him or her of a following separated text.

Another aspect that has to be kept in mind is that a sighted person can find a passage in the text more easily than a blind person. If, for example, the teacher refers the students to a passage several pages back in the book, sighted students skip most of the text searching only for the headline of this passage with their eyes. The braille edition of a textbook, however, comprises several pages for the page the teacher asked the students to look at. After the page is located, the headlines have to be found. As blind students have to pass over every word at the beginning of a line with their fingers in order to find the passage in question, they will need much more time than sighted students.

As braille has a physical rather than visual nature, format standards are utmost important in braille and are crucial for finding a specific passage in the text in a shorter time. Although blank lines should be avoided in a normal text, e.g. between paragraphs, in order to reduce the size of the text, their systematic application has proved to be very efficient in regard to this problem. For example, searching for a specific inkprint page when using the computer is quite easy by using the search option. When using an embossed version of the text the page has to be found scanning at least some letters of the first word at the beginning of each line. Indicating the page number in the text by p, for page, followed by the page number of the inkprint version makes sure that the page number is not confused with the number of an exercise. Leaving a blank line before and after the inkprint page indicator allows the student to scan for one line of writing sandwiched in between two blank lines. This proved to be faster than scanning for the page indicator alone.

As each inkprint page results in several braille pages, each braille page should have a page indicator containing braille page number and inkprint page number in one corner of the page. If the inkprint text is contained in four pages of braille text the letters a, b, c, and d should be added after each inkprint page indicator. This will also



show the student if this braille page contains the beginning, a middle part, or the end of the inkprint page. Thus, the indicator 26-6c would translate to braille page number 26, indicating that it contains the third braille page of page 6 of the inkprint version. If an inkprint starts in the middle of a braille page this can, for example, be indicated by 27-6d/7a, which means that page 7 of the inkprint version starts somewhere on page 27 of the braille version.

Finding a specific passage of text in a minimum amount of time is equally relevant in the case of exercises. Here, it is even more important that the blind student can find the respective passage in the exercise fast enough to follow the class. If too much time is spent for searching, too much information will get lost for the blind student or too much time for the whole class will be wasted if the teacher decides to wait for the blind student to find the passage in question. In this case, the student will not only feel uneasy but as well feel to be a burden for his or her fellow classmates, something that should be avoided. The following example from the German textbook I used in class (Hieber, 1986 p 27), where the different conjugations of you (singular, plural, and polite form) have to be practised can clarify this problem:

3 Konjugation du \_\_st, ihr \_\_t, Sie \_\_en

Partner 1 Partner 2

1. Dino Botta Monika Mai
2. Herr Wild Frau Ito
3. Frau Ito Herr und Frau Wild

Partner 1

Woher komm\_\_  
 Wo wohn\_\_  
 Was mach\_\_

Du
Ihr
Sie

Was studier\_\_  
 Was (sein) \_\_  
 Wie heiß\_\_

du
ihr
Sie

Partner 2

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

For a sighted student due to the layout it is very easy to understand who should be partner 1 and who is the corresponding partner 2, which questions should be asked by whom and the different forms of you that should be used. For a blind student, however, such a layout would be very confusing as the whole text is read only in one dimension – from left to right. Too many explanations from the teacher would be needed in order to understand this layout and the fingers would have to scan back and forth and up and down in order to find the different passages. All the exercises were, hence, rewritten and the following rules were worked out:

1. The text has to be written as a plain text file without the use of any symbols.
2. The layout has to be standardized as much as possible.

3. Every braille page has to be numbered with a braille page number and an inkprint page number should be added if necessary as in the case of textbooks. Letters are added to the inkprint page number when the transcribed braille text results in more than one page.
4. Texts have to be written in lines. No columns should be used.
5. No line should exceed 44 cells (blanks included), as this is the maximum amount of braille cells that the embosser prints out in one line. When counting letters in one line it should be kept in mind that capital letters and numbers need one and uppercase words two additional cells. Chinese characters even need up to three cells each.
6. The number of an exercise is written alone in one line after a blank line in order to facilitate orientation in the text.
7. If a sentence in an exercise exceeds 44 cells, the second line can be indented by two spaces so that the student can easily skip this line when searching a specific position in the text.
8. As the combination of xxx is recognised in braille more easily than \_\_\_, \_\_\_ is replaced by xxx whenever the student has to insert a word, a phrase, or an ending of a word.
9. If the student has to make a selection, all the possibilities given in the exercise are written in parenthesis.
10. In exercises “P. 1” or “P. 2” are placed in front of each sentence to indicate person 1 or person 2, respectively.
11. Line breaks or blank lines are inserted only if the finding of a position in the text or the orientation in the text can thereby be made easier.
12. Indenting of one position is used whenever this will help in finding the beginning or ending of a specific section of the exercise.
13. An example is given whenever necessary.
14. Repetitions of text are used if this facilitates the finding of a position in the text.
15. In exercises where the answers are given for the students to check their knowledge, these answers are given in the next line with a symbol (ccc) in front to indicate the beginning of the answer. This enables the student to pause and think about the answer before checking.

The application of all these rules led to the following layout of the same exercise:

3	rule 6
Konjugation du -st, ihr -t, Sie -en:	
P. 1: Woher kommst du?	rules 10, 13
P. 2: Aus Wien.	
a) P. 1 = Dino Botta,	
P. 2 = Monika Mai	rules 5, 7
P. 1: Woher kommxxx (du, ihr, Sie)?	rules 8, 9, 10
P. 2: xxx.	
P. 1: Wo wohnxxx (du, ihr, Sie)?	rule 14
P. 2: xxx.	
P. 1: Was machxxx (du, ihr, Sie)?	
P. 2: xxx.	
P. 1: Was studierxxx (du, ihr, Sie)?	
P. 2: xxx.	
P. 1: Was (sein) xxx (du, ihr, Sie)?	
P. 2: xxx.	
P. 1: Wie heissxxx (du, ihr, Sie)?	
P. 2: xxx.	
b) P. 1 = Herr Wild, P. 2 = Frau Ito	
c) P. 1 = Student,	
P. 2 = Dino und Monika	rules 5, 7
d) P. 1 = Frau Ito,	
P. 2 = Herr und Frau Wild	rules 5, 7

An exercise for checking knowledge (Hieber, 1986 p 17):

(task)

Herr Wild komm\_\_ aus München.  
 Er arbeit\_\_ in Tokio.  
 \_\_\_\_ lernt Japanisch.  
 \_\_\_\_ heißt Yoko Ito.

(answer)

-t  
 -et  
 Er  
 Sie

was transcribed following rules 1, 8 and 15:

Herr Wild kommxxx aus Muenchen.

ccc -t

Er arbeitxxx in Tokio.

ccc –et

xxx lernt Japanisch.

ccc Er

xxx heißt Yoko Ito.

ccc Sie

Another example from the same textbook (Hieber, 1986 p 16) where sentences have to be formed in the same way as the arrows indicate using one phrase of each column:

1 Kombination

Ich	er	Thomas
Sie	Sie	Sie
Heißt	lerne	er
Kommen	wohnt	aus Italien
Was	machen	aus Wien
Wie	heißt	in Bonn
Wo	kommt	Deutsch

In order to make this understandable for the blind student, an example is given (Beispiel: Ich lerne Deutsch. rule 13). The words of the first column are given to make it easier for the student to find the next set of combinations. The words of the second and the third columns are written in parenthesis to indicate that one phrase of each parenthesis has to be chosen (rule 9). Each parenthesis starts in a new line (rule 11). They are indented one space in order to find the beginning of each column faster (rule 12) and both parentheses are repeated after each phrase of the first column (rule 14). If the phrases in one column exceed 44 cells the next line is indented two spaces (rule 7). As with every exercise the number of the exercise is written in an extra line to facilitate orientation (rule 6). The transcribed text has, thus, the following layout:

1

Kombination:

Beispiel: Ich lerne Deutsch.

Ich

(er, Sie, lerne, wohnt, machen,  
heisst, kommt)

(Thomas, Sie, er, aus Italien, aus  
Wien, in Bonn, Deutsch).

Sie

(er, Sie, lerne, wohnt, machen,  
heisst, kommt)

(Thomas, Sie, er, aus Italien, aus  
Wien, in Bonn, Deutsch).

Heisst

(er, Sie, lerne, wohnt, machen,  
heisst, kommt)

(Thomas, Sie, er, aus Italien, aus  
Wien, in Bonn, Deutsch).

Kommen

(er, Sie, lerne, wohnt, machen,  
heisst, kommt)

(Thomas, Sie, er, aus Italien, aus  
Wien, in Bonn, Deutsch).

Was

(er, Sie, lerne, wohnt, machen,  
heisst, kommt)

(Thomas, Sie, er, aus Italien, aus  
Wien, in Bonn, Deutsch).

Wie

(er, Sie, lerne, wohnt, machen,  
heisst, kommt)

(Thomas, Sie, er, aus Italien, aus  
Wien, in Bonn, Deutsch).

Wo

(er, Sie, lerne, wohnt, machen,

heisst, kommt)  
(Thomas, Sie, er, aus Italien, aus  
Wien, in Bonn, Deutsch).

These transformations enlarge the text substantially but other parts of the book that contain few text are compressed so that the braille version comprises about 300 inkprint pages compared to the 224 pages of the original textbook. This is too large for the braille program to process the file. In addition, the braille edition when embossed contains about 1000 pages. Therefore, each lesson was saved as a single file and embossed seperatedly. Thus, the student only has to carry the file containing the lesson that is needed when attending class.

The whole textbook was divided in two parts, so that the first part, containing lessons 1 through 8 and comprising the range of an entire school year, were already available in September of 2000 for the new school year (Luo, 2000), while lesson 9 through 15 together with a word index and a manual written for the braille edition were completed in 2001 (Luo, 2001a and Luo, 2001b). The publisher of the original textbook, Hueber Verlag, Ismaning, granted copyright for the braille edition, which is available from the Resource Center for Blind and Visually Impaired Students at Tamkang University ([anderson@batol.net](mailto:anderson@batol.net)).

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## 為視障生製作外語課程點字教科書

羅珮瑄\*

### 摘 要

視障生參與講授課所使用之課文，均須以點字版做成。除中文點字書外，在台灣之視障生尚有英文及日文之點字書可供其上課使用。然而在德文或其它外語之教科書方面，卻很難找到團體為其進行改寫工作。為使視障生亦能涉獵其它外國語文，故本論文旨在研究如何有效改寫課文。

為方便讀者易於瞭解課文改寫為點字體時，其可能出現的問題，因此本文首先介紹點字體。其次本研究藉由一德文教科書之課文改寫為點字體之諸案例中，指出改寫問題所在，並進一步提出解決方案。此外，作者在課文改寫過程中，自己創設之規則，文中將併同介紹，俾供有心為視障生改寫課文者之參考。

**關鍵詞：**視障生、共同上課、點字、特殊教育學校、外語課程

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\*逢甲大學外語文教學組專任副教授，德國哥廷根大學博士。