The usability of deposit and withdrawal slips for individuals with mental retardation in Taiwan

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ABSTRACTS

The purpose of this study was to investigate the usability of the deposit and withdrawal slips for individuals with mental retardation in Taiwan. This paper first described the current state of the deposit and withdrawal services in Taiwan to individuals with mental retardation. The person with mental retardation often tried hard to adapt himself/herself to the existing deposit and withdrawal slips. This paper addressed the difficulties faced by users with mental retardation in comprehending the contents of the deposit and withdrawal slips. The investigation into the low usability showed no consideration for meeting the demand of users with mental retardation. Thus, this paper proposed a new design of the deposit and withdrawal slips that are adapted to users with mental retardation. The design approach was based on the principle of Universal Design. This paper finally offered some conclusions and suggestions for future work.

Keywords: mental retardation, universal design, usability

INTRODUCTION

Depositing and withdrawing money from a bank account are essential for personal budgeting and money management. To accomplish the deposit and withdrawal tasks, the user must type or print data in the space provided below each item in the deposit and withdrawal slips. Withdrawal slips and Bank cheques require a natural language spelling of an amount, as well as the amount itself.

The Post and all banks offer deposit and withdrawal services. All men should be served with justice. Very few individuals with mental retardation benefit from the use of the services. Individuals with mental retardation are underserved and frequently misunderstood. The Post and all banks never understand and anticipate what problems individuals with mental
retardation face when filling in the deposit and withdrawal slip. Currently, the services usually do not consider the demand from individuals with mental retardation. Due to the lack of services and supports to assist the individuals in bank depositing and withdrawing, hence they may be prevented from accessing money.

A recent survey of the current studies indicates that data on usability and accessibility of the slips for individuals with mental retardation is nonexistent. In designing the deposit and withdrawal slips, usability and accessibility of the slips for users with mental retardation should not be ignored. This paper addresses the difficulties commonly encountered by people with mental retardation when they try hard to fill out the slips. Some of the difficulties are due to the cognitive barriers to use the slips, some are due to the barriers the slips itself create. The barriers hinder people with mental retardation from engaging in independent living activities. The slips need to be redesigned as accessible to users with mental retardation as other common elements of society; moreover, be adapted to as many users and user conditions as possible.

**COGNITIVE BARRIERS**

The deposit and withdrawal slips are now in widespread use. The first thing to use it is to take and identify the right slip. One may make a check of the title of the slip. However, it is difficult for people with mental retardation, having severe to profound mental retardation especially. The slips seem look alike. They have the alternative of coloring of slip. The deposit slip and the withdrawal slip are omni-colored by red and black respectively. It would help the differentiation between the deposit and the withdrawal slips.

The content of the deposit and withdrawal slips involves solely text. Those users with mental retardation may face difficulties while reading and understanding the textual labels and content of the slips. They could not identify with the points of the slips. In addition to reading, filling in the deposit and withdrawal slips does rely on math, spelling, and writing skills, and remembering multi-step tasks. They may not recall all the steps and may jumble the steps. These skills are beyond the ability of most people with mental retardation as well. For those users, the cognitive load is high due to mental condition.

**BARRIERS THE SLIPS CREATE**

To date, the conventional form of the slips has never changed for the Post and all banks in Taiwan. Users with mental retardation may be unable to use the deposit and withdrawal slips with the same ease as the public. It revealed that the current design of the deposit and withdrawal slips does not fit users with mental retardation. The design problem for the slips needs to be reexamined.

The fast socioeconomic development in the past decades results in a change in the currency
Taiwan money has a decimal system. In the past, the monetary units of New Taiwan Dollar (NTD) include “角” (read as: jiao, which is one-tenth of a dollar) and “分” (read as: fen, one-hundredth of a dollar). While due to the rapid progress at socioeconomic level, the units “角” and “分” are no longer fit to use in practice. The smallest unit of NTD nowadays is “元” (read as: yuan, a dollar), but “角” and “分” are still printed on the slips. The existence of the ineffectual units may confuse users with mental retardation.

The way to fill out the amount of money in the deposit slip and the withdrawal slip differ from each other. To write a nine-digit number, the deposit slip provides a row of small blank grids with corresponding units of NTD. A depositor has to fill in each small blank with a decimal digit. Nevertheless, the withdrawal slip provides one more long blank space. To withdraw money from a bank account, a withdrawer has to fill in the two blank spaces with the same amount in figure and the uppercase Chinese characters separately. Additionally, for users’ handwriting reference if necessary, the shape of the uppercase Chinese character for the numbers zero to nine can be found in the margin of the space provided below the item about the amount of money.

There are two ways of expressing numbers in Chinese, the uppercase and the lowercase. The uppercase Chinese characters have more strokes and are more complex than the lowercase in the Chinese number system. For example, “貳” (read as: er) and “二” (read as: er) express number two in the uppercase and the lowercase Chinese character respectively. While writing in the lowercase Chinese characters, the addition of strokes will cause the wrong amount of money. The uppercase is a formal way of expressing numbers in Chinese to prevent such alteration. It is required to fill out the amount of money with the uppercase Chinese characters in the withdrawal slip. However, the requirement causes high cognitive load for users with mental retardation.

In addition to the uppercase Chinese characters, the user has to write the Chinese character “整” (read as: zheng) of many strokes to end filling out the amount of money. However, by “整” we mean “sharp” when telling the time. For example, we say “Three o’clock sharp”. The meaning of the character “整” might seem confusing to users with mental retardation.

The abbreviated word “原留印” (meaning, to affix one’s seal) is not a common Chinese usage in our daily lives. The additional footnote to the word may be unclear to the mass population, not to mention to be understood by the target population.

METHOD

This study has been conducted in a “problem-oriented” manner to explore the usability and accessibility of the slips. We dealt with the design problem on the principles for Universal Usability. The new design attempted to be adapted to users with mental retardation. In our pilot test, the subjects were forty mildly to moderately mentally retarded students in special
education programs in Taiwan. After field interviews, we elicited the personal experiences of some students.

RESULTS

We found that over 32% of the subjects had no capacity for fill out the deposit slip, and over 89% of subjects had no capacity for fill out the withdrawal slip, see the figure below.

In this section, we describe several of the errors in the deposit and withdrawal tasks for the participants.

- Some users are unable to recognize the consequences of their choice of deposit and withdrawal slips even though the slips are omni-colored.
- The Chinese word “小寫” (lowercase) is misworded in naming the item to fill out the amount of money with Arabic numerals in the deposit slip. To be precise, the item name should be “數字” (amount in figures), rather than “小寫”.
- The symbol 0 in the two rightmost grids “角” and “分”, printed on the deposit slip, may confuse users with mental retardation. Further, the smallest unit in NTD is no longer “角”, but rather “元”. The two grids can be eliminated.

With consideration of the cognitive or intellectual characteristics of the target population, it is necessary to redesign deposit and withdrawal slips in ways that minimize the skills and abilities required to fill out the slips. We give some recommendations and guidelines for
designing universally accessible slips.

- Near the title name of the deposit slip and the withdrawal slip, add easily understandable icons or labels where they will help give a sense of what the slip is about at a glance.
- Provide easily understandable labels or symbols for the items in the slip, such as “局號”, “帳號” (account number).
- Highlight proper words in the slip.
- Supplement steps and descriptions of how a slip is used with graphics to facilitate comprehension of the context.
- Put prompts in order in the margin of the space provided below the item.
- Ensure the high reading understandability of the icons, graphics, labels, or symbols used.
- Keep steps to fill out the deposit and withdrawal slips intuitive.
- Keep the content layouts on a slip of paper as simple as possible.
- Avoid unnecessary items and fields, the item “新設戶” (meaning, to open a bank account) and “提款後結存” (meaning, the balance on an account) for example.
- Provide blank spaces enough to write data in the slip, such as an account (in the bank).
- For withdrawing, allow filling in the blanks with digits with uppercase Chinese characters.
- In writing numbers, adopt a more flexible place-value notation system in which each position may be represented by a unique symbol or by a limited set of symbols.
- Provide a row of small blank grids instead of a long blank space, to guide users with mental retardation to fill out the amount according to Chinese number units.
- Provide the possible symbols for the words for a hundred “佰” (read as: bǎi), a thousand “仟” (read as: qiān) and ten-thousand “萬” (read as: wàn), to help users with mental retardation associating Chinese number units and digits. Suggest the inclusion of symbols to help make uppercase Chinese characters “壹” (meaning, one) to “玖” (meaning, nine) more comprehensible.
- Use plain words instead of abbreviations and terminologies.

DISCUSSION

The target population may benefit from the proposed design. The design accommodates to the cognitive or intellectual limitations. The design would help decrease the amount of time required from teachers, staff or family members to assist in the task of filling out the slip, and enable individuals with mental retardation performing the same task as their peers; and further, it would enhance independent money management skills. Other potential benefits of the
proposed design for individuals with mental retardation include: decrease dependency on others to perform a routine task, enhance self-determination, and promote societal inclusion.

CONCLUSION

This section offers conclusions and some future works. The usability and accessibility of deposit and withdrawal slips for users with mental retardation were inspected and discussed. Acting on the recommendations mentioned above will help make deposit and withdrawal slips more comprehensible and accessible. The proposed design can improve, enhance self-determination, and promote societal inclusion of an individual with mental retardation. The slip design may also create access improvements for other users with cognitive impairments and learning difficulties. More works on the assessment of the proposed design for further improvement need to be undertaken. Other future works are to persuade the Post to change into the proposed newly designed slips and promote the new slips in the Post toward true comparable universal usability.

REFERENCES

