

The Study of Status and Needs for Instructional Media of Blind Students from Upper Elementary School in Thailand

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Abstract—The objectives were to survey the status of instructional materials applied in classroom of students who are blind or visually impaired and to collect their opinion and requirement. The population was students with visual impairments in elementary and middle class sampling by multi-stage from 8 schools located in 4 regions of Thailand. The data was collected from 2 schools in each region using semi-structured interview by teachers or parent. The open-ended questionnaire was related to their opinion in subjects and instructional materials. The data from 156 respondents were statistical summarized using frequency and percentage, showing that Mathematics is an important subject for higher education but difficult to understand which could be solved by repeated review. Although braille books are good for blind students, they prefer real materials/objects to improve their understanding. All student samples need 3-D materials for tactile aids and auditory aids to enhance their learning especially for geometry.

Index Terms— Blind student, Elementary school, Instructional media

I. INTRODUCTION

All blind people had the complete physical and mental potentials. They needed to learn and practice, including being treated with care, attention, and assistance from the society in several aspects, especially in the education being able to live in the society like any normal people and to have knowledge from studying necessary for their occupations being able to earn their living. But, they were different from people in general about learning with special requirement because the blind people cannot learn by sight. Learning from listening only may not sufficient for the good understanding of several contexts. Learning arrangement provided for perception of the blind people will depend on the remaining senses that were hearing or auditory sense, kinesthetic sense, smelling, and tasting. Among the remaining senses, the auditory sense (tactile) and kinesthetic movement (kinesthetic) were the most used senses for the blind people or use of several types of touches at the same time [1]. Therefore, an increase in learning channel from media of listening and touching will

lead to better learning for the blind people. What subject was the problem with studying for the blind people and what kind of media that the blind students liked most, leading to the blind students' learning and clear imagination for high potential development of learning and teaching of the teachers and the blind students. The objective of this research was to study the status and needs for instructional media of the blind students in upper elementary education level in Thailand as the direction.

II. METHODOLOGY

This research was qualitative data collecting from 156 persons of the blind students in upper elementary level and secondary education level through multi-stage sampling. The sample size was fixed by purposive random using the data of the number of the blind students in Grade 5-6 and secondary education (Grade 7-9) as shown in “the report of data on jointly-studied disabled students categorized by education level, gender, type of disability” of Bureau of Special Education Administration, Office of the Basic Education Commission for Academic Year 2015 [2]. Since there were total 1,204 students in 5 education levels, the sample group size was used at least 10% of total as in case of population in thousands, resulting in the minimum number of 120 students. The survey area was selected through purposive sampling in 4 regions of Thailand that were the North, the Central, the South, and the Northeast Regions. At least 30 students per region were acquired by simple random sampling from 2 provinces in each region totaling 8 provinces and 1 school was chosen from each province to provide total 8 schools.

The instrument used for gathering data was semi-structured interview with the total 3 parts comprising. Part 1: Inquiry about the status of questionnaire respondents, Part 2: The status and needs for using the instructional media, and Part 3: Additional suggestions from open-ended question. The researcher, the teacher, and the parents conducted the interview as the prepared questionnaire and recorded the answering data. In the interpretation, several types of data analysis were used. The data of choosing the answer was analyzed by frequency distribution and percentage calculation. The data from filling in the blank, and the open-ended question were analyzed through content analysis method by gathering opinion and suggestion mentioned in the questionnaire for systematic data category. The description and flowchart were then presented to be clarified.

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III. RESULTS AND DISCUSSION

The results were concluded into 3 parts, namely the status of questionnaire respondents, the status and needs for usage of instructional media, and additional suggestions from the open-ended question as follows:

A. The status of questionnaire respondents

From the number of questionnaire receiving, the respondents were the blind students in upper elementary level or Grade 5-6 and secondary education level (Grade 7-9) for the total 156 students. The data of questionnaire respondents was categorized into region, gender and education level, as shown in Fig. 1-2.

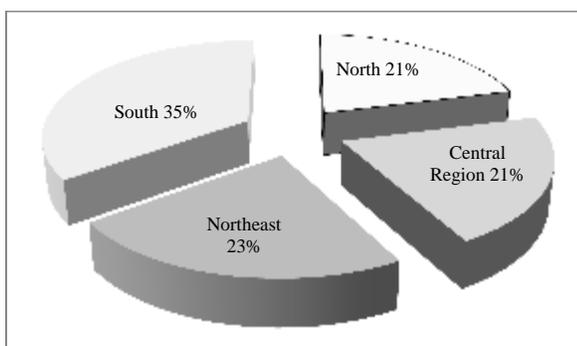


Fig. 1. Flowchart for percentage of sample group categorized into 4 regions of Thailand.

Fig. 1 shows that the sample group for the total 156 blind students was distributed throughout 4 regions of Thailand. Mostly, the questionnaires responded by 54 students as 35% of total were sent back from the schools in the South region. Secondly, there were 36 students as 23% of total sending from the Northeast region. For the North and the Central regions, there was equal number of 33 students each or 21% of total.

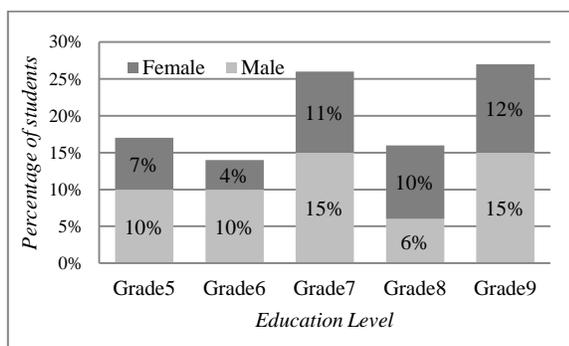


Fig. 2. Flowchart for percentage of sample group categorized into gender and education level.

Fig. 2 shows the education level of sample group for the total 156 blind students that most of them were studying in secondary education level. Mostly, there were 43 students as 27% were studying in Grade 9. Secondly, there were 40 students as 26% were studying in Grade 7. Thirdly, there were 27 students as 17% were studying in Grade 5. There were 24

students as 16% in Grade 8 and 22 students as 14% in Grade 6. The sample group of male students was more than that of female students.

B. The status and needs for instructional media

From the study of the status and needs for using the instructional media of the blind students in Grade 5-6 and secondary education level (Grade 7-9), the data was concluded as shown in Fig. 3 – 6. From the open-ended question, the opinion and need of the blind students was asked toward the subject of 8 learning groups as the following questions and the results were shown in Fig. 3.

- Specify the important subjects for higher education.
- Specify the difficult subjects that they have little understanding or can't understand.
- Specify the subjects that they can have more understanding if they can touch and listen to the detail description.
- Specify the subjects that need to produce the tactile and audio media.

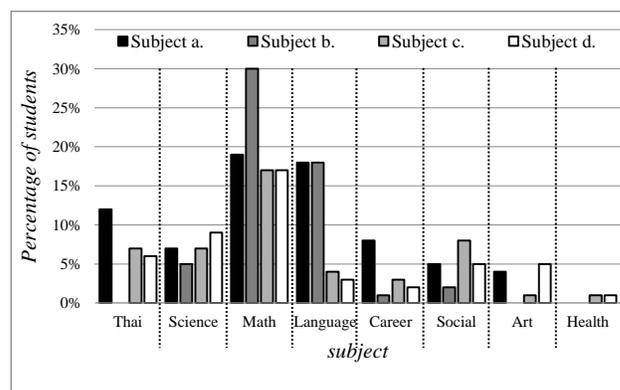


Fig. 3. Flowchart for the opinion and need of the blind students towards the subjects of 8 learning groups.

Fig. 3 shows that most of the blind students had the same opinion towards Mathematics as the first rank being important to studying in the higher education level. It was the subject with their less understanding or without their understanding. In case the blind students can learn by touching and listening, they may have better understanding. Mostly, Mathematics was the subject that needed the media production, which was complied with J. Chaiyadech [3] who said that the blind students had less understanding of the Mathematics subject because most of its contents were rather "abstract" pattern for the visually impaired students. From the study of several psychologists, there was the same conclusion that learning of the visually impaired students will be "concrete" pattern. In the same content, the students in general use their eyesight for perception of picture, symbol, sign, and process being organized to be "thinking process". However, the visually impaired students cannot use their eyesight for their perception of these things. The visually impaired students needed the media, material, and equipment different from the students in general for their perception through the remaining senses such as embossed image media, braille media, model media, real object media, etc.

For questions about the problem solving methods when the blind students did not understand the lessons in the classroom,

the check list in questionnaire were as following items and the top 5 rankings of item are shown in Fig. 4.

- Reviewing the lessons by themselves repeatedly until understanding
- Asking for advice from the teacher
- Asking for advice from their friends
- Searching internet for lesson reviewing
- Searching braille book for additional reading
- Etc.

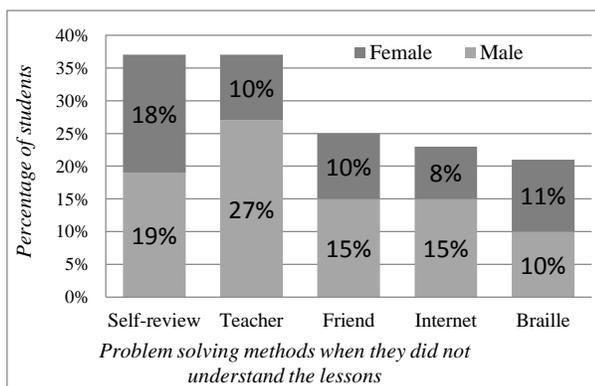


Fig. 4. Flowchart for the top 5 rankings of the problem solving methods of the blind students when they did not understand the lessons in the classroom.

Fig. 4 shows that most of male and female blind students at 37% chose the problem solving methods when they did not understand the lessons in the classroom through asking for advice from the teacher and reviewing the lessons by themselves repeatedly until understanding. This indicated that the teacher had influence in enhancing their learning. If there are the media supporting to their self- reviewing, the students can have more understanding out of the classroom. The male blind students at 27% used the problem solving solution when they did not understand the lesson by asking for advice from the teacher while 19% of them reviewed the lessons by self-reviewing repeatedly. The female blind students at 18% used the problem solving method by self-learning of lessons repeatedly until reaching of their understanding. Therefore, the media for self- reviewing supporting to understanding of the blind students will be considerably useful, which needed further design and development.

For questions about the subjects they prefer and understand, the media types were listed for chosen and the results are shown in Fig. 5.

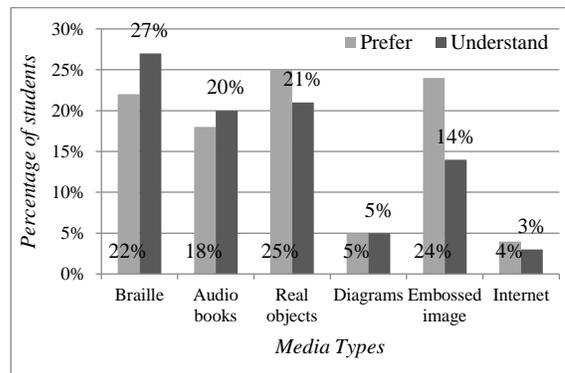


Fig. 5. Flowchart for the opinion of the blind students towards their preferred media types and the media enhance their understanding.

Fig. 5 shows that the media type that the blind students mostly prefer was the real objects. They prefer the embossed image more than Braille book, audio book, and diagram respectively. Mostly, the blind students thought that the best media for their understanding of contents was Braille book. And then, they were real objects, embossed image, and diagram respectively. The results were complied with the research of S. Neamjun [4] who indicated that the visually impaired people were satisfied with audio book in the medium level. Since the audio media had only reading voice, emphasizing on the clear pronunciation and the quality of voice, they then pay attention to only contents from listening. Therefore, the blind students did not prefer this media but use to improve their understanding of the lesson content.

For open-ended questions about the important features of appropriate media for the blind students, they suggested several styles of media they need. The number of the blind students that had the same opinion was sum to form into 5 media groups according to the important features, as shown in Fig. 6.

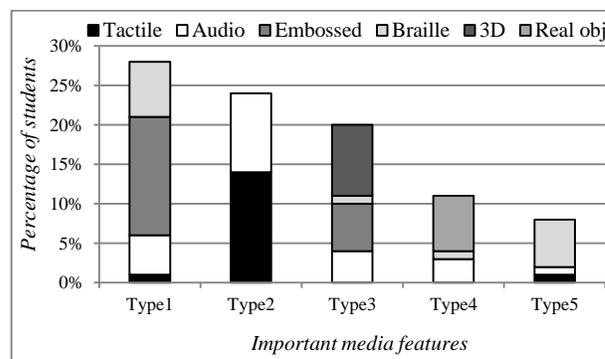


Fig. 6. Flowchart for the important features of appropriate media for the blind students

Fig. 6 indicated that the important features of media should be used for the blind students were mixed media which is combination of tactile media, audio media, embossed image, braille, 3D or real object. In conclusion, there were 5 types of mixed media ranking by importance as follows:

Type 1: The media should be included of the embossed image being able to touch mainly, together with the voice and braille giving description, suggested by 28% of respondents.

Type 2: The media should be able to touch mainly including with the voice, suggested by 24% of respondents.

Type 3: The media should be 3-dimension mainly, together with the embossed image, the voice and the braille giving description, suggested by 20% of respondents.

Type 4: The media should be the real objects mainly, together with the voice or the braille giving description, suggested by 11% of respondents.

Type 5: The media should be the braille mainly giving description, together with the voice being able to touch, suggested by 8% of respondents.

The data indicated that the above 5 types of mixed media had both touching and perception of data by listening and reading. There was data input through the remaining physical organs of the visually impaired person in order to receive the data similar to the normal person, which complied with the research of P. Satitvittayanand [5] who found that the blind children were satisfied with Fairy Tales Book with embossed image greater than Fairy Tales Book with the braille giving description only. According to the research from P. Pijukkana et al. [6]. They reported that the effective media used for the visually impaired students should be mixed together by adjustment of teaching method, media, and several types of equipment to be complied with the different needs and capability of each student.

C. Additional suggestions from open-ended question

a. Suggestion from the students

From gathering the suggestions being mentioned in the questionnaire of the blind students in Grade 5-6 and secondary education level, it can be analyzed for data category and conclusion as follows:

- The blind students needed modern technology to support their potential in living similar to the normal people, i.e. the pen that the blind people can write the normal alphabet letters with the memory or the program to remember the word or the voice of the speaker, the copier being able to convert the normal document to be the braille book for the blind people, the automatic car being able to drive by itself when recording the data of destination including the image-recording camera, etc.

- The blind students needed the aid supporting equipment for their daily lives as the normal people without depending on others, i.e. the car provided for the blind people's driving, the white cane with the sound indicating the position and direction, etc.

- The blind students needed the media to increase their skills in listening, speaking, reading, and writing the important fundamental contents, i.e. print media from several publishers, keyboard of braille to be used with computer, reading equipment of normal book by putting in the fingers, the book being able to explain immediately after complete reading without understanding, the eyeglasses provided for the blind people for reading the normal book or the eyeglasses with the voice, the book reading machine, etc.

b. Suggestion from the teachers

- Mathematics was the subject that approximately 95% of the blind students cannot study as there was no embossed image supporting to that subject, i.e. geometry, graph, geometric shapes, etc. The blind students also cannot remember the braille code that was too difficult for them to read and understand. The

specialized teachers were then required for additional teaching because many braille codes of mathematics were difficult to remember.

- The produced media should be used for practice of skills in reading, writing, listening, and speaking especially for the modern mobile real objects that are compatible with the program for the blind people.

IV. CONCLUSION

The results from this study showed that the blind students have education arrangement same as the normal students in Thailand, according to the Basic Education Core Curriculum [6]. The compulsory subjects were divided into 8 learning groups. In the opinion of blind students, Mathematics was the important subject for the higher level of education but it was difficult to understand. They may have better understanding if they learn the Mathematics by touching corporate with listening. Therefore, Mathematics is the subject they needed most for production of instructional media. The types of media that the blind students liked most were the real objects, followed by embossed image and Braille books, respectively. The types of media that the blind students can understand the content most was braille books, followed by the real objects and audio book, respectively. Therefore, the media should be the real objects being found or used in daily life. In case of the media are not convenient for teachers to use in the classroom such as the living things which are too large or too expensive. The teacher can use the media with same characteristic as the real objects or the embossed image in order that the blind children can learn by touching and listening instead of the sight of the normal children. These media types with natural description voice or the braille for additional description can increased the effectiveness in learning of the blind children.

V. IMPLICATION OF FINDINGS

The data in this survey can be used to develop the instructional media as the following purposes:

- a. To enhance understanding and learning of the blind students in the difficult subjects.

- b. To produce the instructional media suitable for the blind students in the types of media, subject, and contents, as the requirement of blind students.

- c. To select the important contents which were problem or difficult to study for the blind students in order to directly solve the problems.

- d. To consider the suitable types of media for the blind students in the aspects of the preferred media and the best practical media.

- e. To develop the quality of life for the blind people according to the suggestion and requirement of the blind children.

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