Pictogram Icon as a Learning Media for Deaf Students in Visual Communication Design

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ABSTRACT

In 2022, the total number of deaf or deaf students studying at Sahid University Surakarta will be 14 students. The government itself has mandated the right to education for children with special needs as regulated in Article 54 of Law Number 39 of 1999 concerning Human Rights, namely: Every child who is physically and/or mentally disabled has the right to receive special care, education, training and assistance at cost. state, to guarantee life in accordance with human dignity, self-improvement, and ability to participate in the life of society and the state. The obstacle so far has been communication in delivering material from lecturers to deaf students. This is because: 1) 90% of deaf students in Visual Communication Design cannot read written sentences that are too long. Deaf students of Visual Communications Design are accustomed to using hand sign language, namely a visual language that emphasizes the ease of moving hands, not the order of sentences based on SPOK, 2) The digital application used by deaf students to translate the lecturer's voice does not function properly. This is because sentences/words often appear that do not match what the lecturer in the course said. The aim of designing pictogram icons as a learning medium for Visual Communication Design students is that deaf students can understand and understand information about lectures and can carry them out well, so that deaf students are formed who are able to compete in society. To achieve this goal, the Innovation Development method is carried out using the Lee & Owens Model method which produces pictogram icons which can help simplify verbal and written language into visual language.

KEYWORDS

icon; pictogram; learning media

1. INTRODUCTION

Inclusive education in Indonesia began to be developed since the beginning of 2000. Primary to secondary education schools are the main goal in implementing inclusive education. This is based on the circular letter of the Director General of Basic Education, Ministry of National Education No. 380/C.C6/MN/2003 dated 20 January 2003 concerning inclusive education which contains the provisions of organizing and developing in each district/city at least 4 (four) schools consisting of: elementary school, middle school, high school and vocational school. Inclusive education is a teaching and learning process in an educational unit that provides opportunities for people with disabilities to get the opportunity to study together with non-disabled people. This also happens to deaf students in the Visual Communication Design study program, especially at Sahid University, Surakarta.

In 2014 Sahid University Surakarta opened opportunities for deaf and hard of hearing people to pursue higher education. And the Visual Communication Design and Interior Design study programs that have accepted these students include 4 deaf/hard of hearing students in Visual Communication Design. However, starting in 2020, communication problems emerged in delivering material from lecturers to deaf students. Especially when delivering lecture material in class. This is because: 90% of deaf students in Visual Communication Design cannot read written sentences that are too long. Especially those using the SPOK pattern. They are used to using sign language from Pusbisindo (Pusat bahasa Isyarat Indonesia/Indonesian Sign Language Center) which does not pay attention to SPOK patterns, but is based on the rhythm of hand movements. And they are used to using basic words and words that are often used, which tends to read in writing as meaning denotation rather than connotation. Meanwhile, in the Visual Communication Design lecture material, there are many terms/loan words from foreign languages. This means that much of the lecture material in the Visual Communication Design study program is not well understood by deaf students in the Visual Communication Design study program, especially at Sahid University, Surakarta. So that it can hinder the deaf student in carrying out lecture assignments.

The aim of this research is that deaf students can understand and comprehend information regarding lectures, especially regarding terms/loan words from foreign languages and can carry them out well, so that deaf students can be formed who are able to compete in society. This also means that lecture material presented using visual language can be useful for deaf students, namely: a. arouse student motivation and interest, b. Facilitate data interpretation and condense information, c. Make it easier for students to carry out design, animation, photography or film creation assignments.

Theoretical approach combines visual communication design theory with accessibility principles. The main theories that will be used include semiotic theory and the formation of icons and pictograms and visual learning design theory used in compiling pictogram icons as a medium for conveying lecture material. 2. User Needs Analysis by conducting a user needs analysis involving in-depth interviews and surveys of deaf students to identify specific needs regarding visualization of the material needed for learning. 3 Co-Design is a design process that involves deaf students and JBI (Juru Bahasa Isyarat/Sign Language Interpreters) in making the design. This is useful for ensuring that the resulting pictogram is relevant and effective for the user.

This research has the potential to enrich understanding of the use of pictogram icons in educational contexts, especially for deaf students as a form of visual communication which

has the potential to be an effective learning medium for deaf students. The results of this research can also encourage more inclusive policy making in higher education institutions, especially in the field of visual communication design. This is because findings showing the effectiveness of pictogram icons as a learning medium can serve as inspiration for integrating this method into the visual communication design curriculum. This research also encourages designers to pay more attention to the needs of users with hearing impairments which can become the basis for further development of pictogram icons that are not only aesthetically functional but also inclusive and easy to understand by all groups, including deaf students.

2. METHODOLOGY

In solving the problems posed using qualitative research methods. This is where research looks for cause-and-effect relationships by looking at the symptoms, conditions and social phenomena that occur. The research method will be carried out in several stages, including;

a. Data source

This research is about icons and pictograms in the form of infographics as a visual strategy for lecture material for students and will use resource persons who are people/figures who are considered experts in the field of visual icon language, sign language as well as respondents from several deaf students in the Visual Communication Design study program, Sahid University, Surakarta. Library sources will come from research journals related to infographic icons and other related written data.

b. Data collection technique

The observation process coincides with the interview process by systematically recording events, behavior and objects seen. Interviews with icon designers and Sign Language Interpreters were conducted to identify visual types and characters that are easy to understand and understand and attract interest in reading. Deaf/hard of hearing students were interviewed to find out their perceptions and conceptions about visual language.

c. Data validation

Data validity in qualitative research uses data triangulation to ensure the objectivity of the research results (H.B.Sutopo 2002: 78). Data triangulation is the use of various types of data to see more sharply the relationship between various data to prevent errors in analyzing the data. Triangulation method by finding intersections/meetings/similarities between observation data, interviews and literature.

d. Data analysis

The research uses an interactive analysis technique using three variables. Regarding literature study data, observations, and interview results, namely data presentation, data reduction, and drawing conclusions. Interaction analysis is carried out in order to obtain objective results and obtain similarities in the statements of several sources in order to look for intersections or relationships in the data from three sources to obtain a common thread from the data obtained by using emic research to find the common thread, namely based on knowledge and experience of the perpetrator or user.

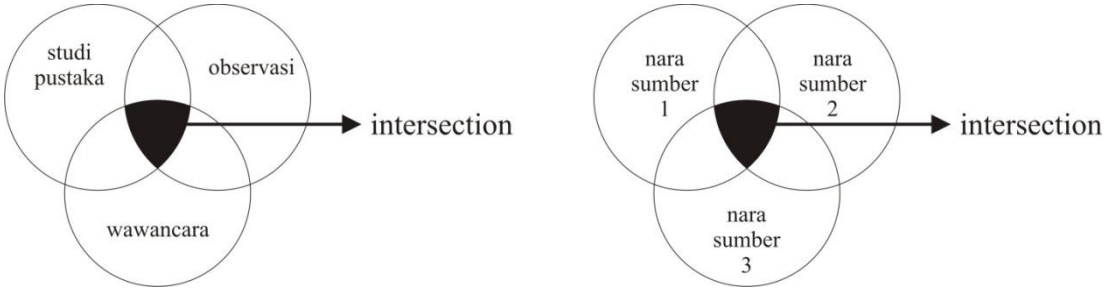

Figure 1. Interactive analysis model
(Source: Evelyne, 2021: 6)

3. RESULTS AND DISCUSSION

Design is work that emphasizes functional aspects that attract attention and are easy to understand. Visual communication design works prioritize visual elements as a medium for communicating with users. Therefore, it requires visual language as a communication medium. This visual language is closely related to signs. The signs displayed are in accordance with the knowledge possessed by the user. Therefore, a special approach is needed in visual modeling, especially for learning media for deaf/deaf students in the Visual Communication Design study program, Sahid University, Surakarta. There are several things to pay attention to when developing a visual strategy for learning media for deaf/deaf students in the Visual Communication Design study program, Sahid University, Surakarta, as follows:

3.1. Function of Icons as Learning Media

The visual design used as a learning medium is a visual display, namely a sign that is able to represent a word. This is because the problem of deaf/hard of hearing students in the Visual Communication Design study program, Sahid University Surakarta is that they do not or do not understand long sentences and only understand basic words. The basic words here are words without connotative affixes and endings.

Data from 15 deaf/hard of hearing students in the Visual Communication Design study program, Sahid University Surakarta who are still active with their hearing ability level in dB (decibels) according to Winarsih (2007), grouped into several categories, namely:

Table 1. Table of deafness level of deaf/deaf students

	Man	**Woman**
Hearing loss 15-30 dB		
Hearing loss 31-60 dB		1
Hearing loss 61-90 dB	2	1
Hearing loss 91-120 dB	5	2
Hearing loss is more than 120 dB	3	1
Total	**10**	**5**

Source: 2018-2022 observation results

Loss of 15-30 dB, mild hearing losses or mild deafness; ability to perceive normal human speech sounds. Loss of 31-60 dB, moderate hearing losses or moderate hearing loss; the ability to perceive human speech sounds is only partial. Loss of 61-90 dB, severe hearing losses or severe deafness; the ability to perceive human speech sounds is non-existent. Loss

of 91-120 dB, profound hearing losses or very severe hearing impairment; the ability to perceive human speech sounds is completely absent. Loss of more than 120 dB, total hearing losses or total deafness; the ability to perceive human speech sounds is completely absent.

Based on table 1, it is known that 14 students had a loss of 61 dB to more than 120 dB, so this made them have problems understanding written sentences as follows:

Table 2. Table of levels of deaf/hard of hearing students

Kesulitan	Man	Woman
Understanding SPOK sentences		1
Paragraph written sentences	2	1
The word means denotative	8	2
Words with Connotative Meaning		1
Total	**10**	**5**

Source: 2018-2022 observation results

Based on table 1, it is known that 14 students had problems understanding sentences in paragraph form which had a SPOK pattern and had a connotative meaning. D Denotative meaning is the real meaning, the meaning that corresponds to what is written. Meanwhile, connotative meaning is an implied meaning or a figurative meaning. Deaf/hard of hearing students are accustomed to reading signs/signs visually. Whether reading lips, reading body language or reading hand signals. However, of the 15 deaf/deaf students in the Visual Communication Design study program, Sahid University, Surakarta, only 8 understand how to communicate well using hand sign language. Thus, this creates another model of visual communication media that can provide an understanding of lecture material that can be seen, read and studied repeatedly. A visual display that can replace a word or sentence in one visual display. One way is to visualize icons. Icons are representations/translations of words/sentences that have similarities/similarities (Batista et al., 2019). Icons enable people to understand information effectively (Andang & Puji Prabowo, n.d.).An icon combined with several symbols or signs will form a pictogram. Pictograms can make boring information or material more interesting and easier to remember. Pictograms are used to visualize data, presentations and information more easily to understand (Rahmah & Kusmiyarsih, 2023).

3.2. The basic concept of forming icons as a learning medium

Problems in understanding lecture material for deaf/hard of hearing students in the Visual Communication Design study program, Sahid University, Surakarta due to obstacles in understanding the material in written form with paragraphs and SPOK structure. This requires a visual display of icons that can translate a word/short sentence in one visual display.

For example, in data analysis material. Data analysis is the main thing used in developing the concept of Visual Communication Design. Data analysis is mandatory in every design or design of visual communication. In data analysis, there is segmentation which functions to find the character of the target consumer, USP (Unique Selling Preposition) which functions to find differentiation and ESP (Emotional Selling Preposition) which functions to generate the desired emotions in the minds of consumers regarding the product or message conveyed through visuals.

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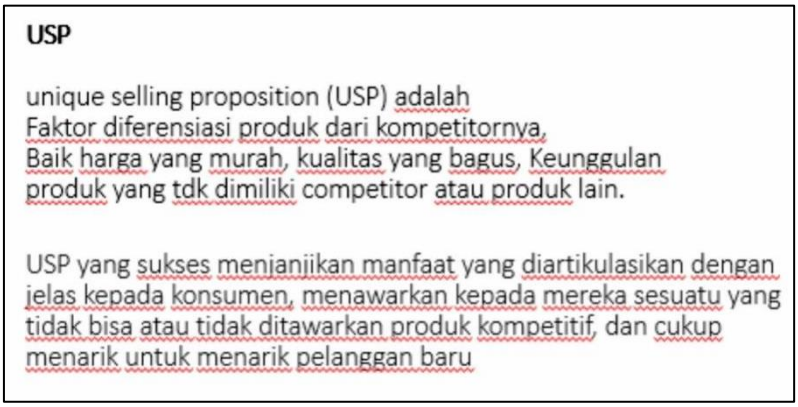

Figure 2. Visual Communication Design lecture material about USP
(Source: Evelyne, 2020)

However, deaf students who are used to using sign language, which is a visual language, will find it easier to understand if the definition of the data analysis section uses visual language or pictures or illustrations.

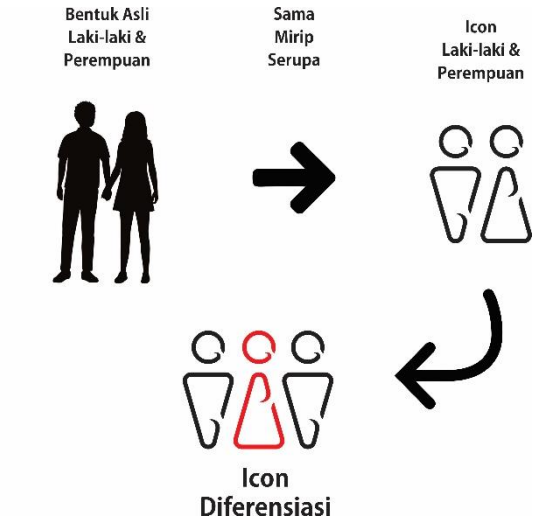

Figure 3. Differentiation Icon Design for USP Material
(Source: Evelyne, 2020)

The material in Figure 3 is simplified by using visual language, namely in the form of icons, focusing on the core material regarding USP, namely the differentiation/difference of the product from its competitors, which contains product advantages and promises of benefits that competitors do not offer. And the icon shape to explain the USP becomes:

Figure 3. Form of content about USP
(Source: Evelyne, 2020)

3.3. Configuration of visual elements that form learning media

Based on Figure 2 above, it shows that 100% is dominated by writing. The illustrations/pictures on the slide do not help explain further the presentation of the writing in paragraph form on the left.

Based on this, for deaf/deaf students it is necessary to simplify the content of the material on the slides. This simplification is done by selecting words/sentences with core information. So, make sentences that are not too long but informative and do not cause misunderstandings. Therefore, this form of simplification uses a pictogram form which focuses on illustrations/images.

Simplifying sentences in the form of icons arranged into pictograms by reducing the number of words and focusing on the core information to be conveyed, bolding important words and using sans serif fonts/letters. The use of sans serif fonts/letters is because the character of the sans serif type is impressive, flexible, relaxed and easy to read when arranged in long sentence form (Wang et al., 2018). And to avoid discomfort, eye fatigue and stay focused when reading the words/sentences displayed, the font size used is 18pt – 20pt. This is done so that the function of using typography in completing textual word elements can improve cognition and understanding of the message. (Poon, 2021) The use of typography can also have the effect of understanding information well by paying attention to design principles, thereby displaying visuals that are not only attractive, but also pay attention to comfort in reading which is able to generate a sense of trust in the information conveyed (Thiessen et al., 2020) relevant information.

4. CONCLUSION

This research can make a significant contribution to the field of education and visual communication design by developing innovative and accessible pictogram icon-based learning media. This is because it involves deaf students in the design process, so it is hoped

that it can produce more effective and inclusive learning media to improve the quality of learning in a way that suits the needs of deaf students in the Visual Communication Design study program. Further research can be carried out to explore the use of pictograms in other courses or study programs. Apart from that, research can also focus on developing more comprehensive evaluation methods to measure the effectiveness of this learning media.

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