

# Literature Review: Access Visual Communication for Deaf

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## ABSTRACT

The development of mass media to obtain information needs to be supported by providing accessibility for the deaf. Easy access with the principle of equality in diversity and responsiveness to the needs of persons with disabilities in public services. The purpose of accessibility services is to provide convenience in listening, receiving, and understanding the delivery of information easily with certain media, but it is not optimal and comprehensive. Through a qualitative approach, data were collected from various kinds of literature regarding the accessibility of information media for the deaf. The literature search was conducted through Google Scholar, ScienceDirect, Springerlink, Mendelej, ACM Digital Library, Proquest, IEEE Xplore, Researchgate, and Semantic Scholar. The provision of accessibility as accommodation for obtaining information for the deaf already exists in various public services, dominated by the provision of sign interpreters, subtitles, and the development of immersive technology products to accommodate information acquisition. Therefore, the fulfilment of the right to obtain information and knowledge must continue to be developed with collaboration and cooperation to provide more friendly and useful accessibility with professional resources.

**Keywords:** *Accessibility, Visual communication, Deaf.*

## 1. INTRODUCTION

The development of the mass media in providing information and knowledge through the help of information technology. Media is an intermediary tool that can provide messages to message recipients. Mass media as a form of advancement in information and communication technology, through the growing mass media, allows information to spread easily to the public. Information in any form can be accessed easily and quickly so that it affects the perspective, lifestyle, and culture of a nation. The role of the mass media in providing actual information that can be consumed by the general public certainly needs to pay attention to accessibility services for ease of listening, receiving, and understanding the delivery of information.

Media features operate as a learning resource. This can attract students' attention, speed up the educational method and improve the standard of education. Hamalik declared that media's utilization within the teaching and learning method arouses students' need for brand new interests, resolutions, stimulation of learning, additionally as giving psychological influence to students. Media as a tool for the process of delivering messages has a broader understanding than just physical

form [1]. It can be concluded that learning media is something that can convey messages, stimulate the thoughts, feelings, and desires of students or others so that it can encourage the teaching and learning process from direct observation or the results of translation (interpreters/sign language interpreters).

Through media's existence as one of the supporters in fulfilling the right to obtain access information. One of the benefits of accessibility is as a tool [2]. The tool is intended as a path to a goal that has been selected and set. Media accessibility must also include access to creation, namely access to equipment, funding, and job opportunities allow people with sensory disabilities to create audio-visual products that can provide a more inclusive and empathic audio-visual experience [3]. The need for information has prompted the public to place the media as one of the necessities of life. The presence of information technology through the internet or online media is welcomed by everyone. However, it is necessary to provide services that are accessible for people with deaf disabilities in obtaining information through mass media such as the news from television, public services, and health. The role of accessibility here can be used as a medium that makes it easy to get a goal by way, road, media, and a certain strategy. The

implementation of accessibility for people with deaf disabilities has been developed in several parts of the world, with an emphasis on each sector and certain intermediary media.

The implementation and fulfilment of the rights of persons with disabilities are based on a. Respect for dignity; b. Individual autonomy; c. Without discrimination; d. Full participation; e. Human diversity and humanity; f. Equal opportunity; g. Equality; h. Accessibility; i. Developing capacities and identities of children; j. Inclusive; and k. Special treatment and more protection (chapter 2 of law Indonesia number 8 of 2016). One of the principles of implementing and fulfilling the rights of persons with disabilities is accessibility. Accessibility is the fulfilment of adequate accommodation. Measures are taken to modify and make appropriate adjustments to ensure the enjoyment or exercise of all human rights and essential freedoms for persons with disabilities on an equal basis.

Government services include service providers for persons with disabilities. Following the provisions of rules and regulations, public providers are required to provide services which are easily accessible to people with disabilities. This accessible access is based on the principle of equality in diversity for people with a disability and is responsive to their needs (government regulation Indonesia number 42 of 2020). It is also explained in government regulation number 42, article 17 , paragraph 2. Education, teaching, work and business, housing, communication and information, environment, health, as well as social services are even included in the scope of services.

The fulfilment of rights must also provide technology that is easily accessible. Accessible technology to support adequate accommodation should at least be equipped with the following facilities: audio, braille tactile signs, and informational or visual cues[4]. The provision of services (assistance, translation, and assistance) in these public service places also needs to be carried out by professional experts or those who have received special training in public services for persons with disabilities. The existence of each individual has essentially been given convenience by the state by providing adequate accommodation through existing accessibility provisions. However, the fulfilment of communication access for the deaf in various circumstances. Therefore, the role of communication media becomes necessary to be studied in providing information, knowledge, and new things.

**2. METHODS**

**2.1. Selection Criteria**

Literature searches are conducted through google scholar, science direct, springerlink, mendeley, acm

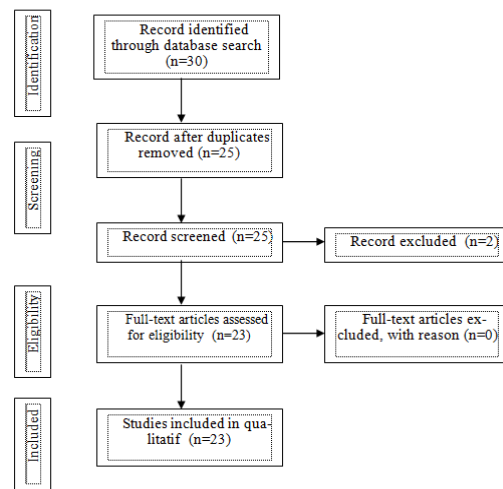
digital library, proquest, explore, researchgate and semantic scholar. The keywords used are accessibility, media, deaf, and interpreter. Searches were conducted in march-may 2021.

**2.2. Procedure**

Abstracts in the literature obtained from electronic searches and according to keywords are then read to determine whether they match and match the criteria determined by the author. After selecting the abstract, the next step is to read the literature and analyse it. The literature analysed has criteria to be met, namely published between 2013 and 2020, and discusses providing access to communication through the delivery of information and communication media for the deaf.

**2.3. Analysis Procedure**

The recording was carried out on the selected literature, including information about the author, year of publication and research location, subject characteristics, research objectives, measurements, intervention design, and findings. Then the data obtained were compared, while the intervention design and the literature results were analyzed. A descriptive analysis was conducted to extract information from each literature. The process of searching and reviewing the literature can be seen in Figure 1.



**Figure 1** Process of searching and reviewing the literature

At the identification stage, 30 pieces of literature were obtained which were quite relevant to the research topic. Furthermore, screening is carried out by selecting and eliminating articles that are not suitable, articles with the same content and 25 literatures are obtained, which will be reviewed except for 2 kinds of literature. After that, it entered the stage of assessing the feasibility of content and literature that met the research qualifications, namely 23 literatures.

### 3. RESEARCH RESULTS

Summary table of the review on Table 1.

**Table 1.** The review studies

No	Author	Purpose	Research design	Sample
1	Fresco-Romero Pablo (2018)	Supports media accessibility for people with and without disabilities who require audio-visual content.	Correlation descriptive	
2	Mustarjudin (2017)	Assessing the effectiveness of sign interpreters in Mosque Khutbahs	Descriptive	N=11
3	Yustikaningrum, Rima Yuwana (2020)	Fulfilling the right to access information of deaf friends in Indonesia in the constitutional court	Qualitative and quantitative	
4	Hapsari, Dwi Novi et.al., (2018)	Produce a good augmented reality product to supplement the sign language module.	Rnd lee & Owens	N=38
5	Hastomo Aji, Muhammad Reza (2020)	Compcommitting the law of notary positions in Indonesia (UUJN) with the notarial department of Japan (Kōshōninhō) act in the case of notary public find a deaf community as its clients.	Normative jurisdiction	N=2
6	Sridiasti Ayumar et al. (2019)	Knowing the influence of nutrition education with BISINDO-based lecture methods and booklets on nutrition knowledge, attitudes and practices in deaf SLB Youth in Semarang	Quasi experimental with pre-post test group design.	N=27
7	Azmir Miranda, et al. (2019)	Measuring the effectiveness of BISINDO in evening news Trans7 in the deaf community of Bali, a community that conducts BISINDO socialization	Quantitative, direct reciting	N=30
8	Alys Young, Rosemary Orman dan Jemina Napier (2019)	Know the impact of working relationships between listening and deaf people who use sign language	Qualitative	N=8
9	Landa, R. L., & Clark, M. D. (2018)	Obtained certification for Interpreter Education Program (IEP) at American Sign Language (ASL) through Language Assessment Literacy (LAL) and taxonomy bloom.	Qualitative	
10	Hommes, R.E., Borash, A.I., Hartwig, K. et al (2018)	Determine American Sign Language (ASL) translators' perceptions of communication barriers between visually impaired and hoh patients and healthcare providers.	Survey	N=146
11	Montagud, Mario; Orero, Pilar; Fernández, Sergi (2020)	Shared access service (captions, audio descriptions and sign language) with vr360 content	Research and development	
12	Caitlin McKeown dan Julia McKeown (2019)	Propose a model that explains three impede that hearing impairment students face when learning online: Barriers to learning management systems (LMS), course material, and material communication	Research and development	
13	Xiaoyan Xiao & Feiyan Li. (2013)	Uncovering the gap between the intent of the program maker and the reality experienced by deaf viewers, as well as examining possible differences in modalities in the quality of perception	Survey	N=336
14	Pierre Schmitt (2017)	Know the model of discourse space in art and media	Literature review	
15	Anirban Sengupta; Tausif Mallick; Abhijit Das (2019)	Convert hand gesticulate based on the electronic device in the form of Bluetooth gloves	Research and development	
16	Rating C.J., Kuntze M. (2016)	Socialize optimal language in natural sign language, and the majority spoke	Qualitative	

No	Author	Purpose	Research design	Sample
		language for deaf children.		
17	Freitas, César & Delou, Cristina & Amorim, Gildete & Teixeira, Edilene & Castro, Helena. (2017)	Analyzing the opinions of Brazilian translators working at the federal institute of education, science and technology in the northern region of Brazil in the academic success of students as well as in the process of inclusion in society	Qualitative-quantitative by using a questionnaire with structured and unstructured questions	N=11
18	Kelly Mack et al. (2020)	Learn deaf cues on social platforms, which focus on sharing social content and the barriers deaf face	Interview and survey	N=60
19	Roberto Borrino, Marco Furini, and Marco Roccetti (2009)	Discover, acquire, modify, and enrich social media content for presentations through tv sets, so that people with technological, sociological, or physical disabilities can enjoy social media and can participate in the social media revolution with SOMFA (social media for all)	Research and development	
20	Brent N. Shiver and Rosalee J. Wolfe (2015)	Know the effect of using captions and transcribing on online media on television or video	Interview	N=115
21	Duarte C., Fonseca M.J. (2019)	Review existing access services, with subtitles, sign language, and audio descriptions to ensure all have equal access to produced content	Literatur review	
22	Matthew Seita. (2016)	Assess features and translation quality that appeal to deaf viewers	Evaluation method	
23	Yi-Hao Peng et al. (2018)	Know the use between speech bubble visualizations and prototype over traditional captions for deaf and deaf-hard hearing conversations	Interview and co-designed	N=8

### 3.1. Deaf Accessibility

Accessibility is defined as something that can be used to do and or get something. Furthermore, in Article 1 paragraph of Law No. 8 of 2016 on Persons with Disabilities, it is explained that: "Accessibility is an ease provided for Persons with Disabilities to realize equality of opportunity." Based on the above provisions, accessibility for disabilities is provided to support activities for those disabilities to live a life of the same standards and qualities as other communities.

Concerning the right of persons with disabilities in obtaining public facilities, here are some of the arrangements under the Disability Law:

1. Obtain accessibility to utilize public facilities;
2. Obtain the right of public services, persons with disabilities are entitled to assistance, translation, and provision of facilities that are easily accessible in public service places at no additional cost;
3. In disaster conditions, persons with disabilities are entitled to accessible rescue and evacuation facilities and facilities and get priority, facilities, and facilities that are easily accessible at the evacuation site; and
4. The right to express, communicate, and obtain information of persons with disabilities, including the right of one of them is to use and obtain information and communication facilities in the form of sign language, braille,

and augmentative communication in official interactions.

Accessibility is a decent accommodation. Measures were taken by providing special needs and appropriate compensatory services to ensure the enjoyment or implementation of all human rights and essential freedoms for all human beings, including persons with disabilities, on an equal basis.

Fulfilment of rights must also provide technology that is easily accessible. Technology that is easily accessible to support adequate accommodation is equipped with at least the following facilities: audio, braille tactile signs, and information or visual cues. Supported by Maksum Research that service effectiveness digital information tends to be determined by the level of need users and availability of accurate information, speed and accuracy in service especially determined by the availability of access facilities[5]. So that the provision of services in public service places also needs to be carried out by professional experts or who have received special training in public services for persons with disabilities. The scope of services includes education, teaching, work and business, housing, communication and information, environment, health, social security, energy, banking, transportation, natural resources, tourism. And other strategic sectors[6]. This service is an effort to support accessibility for people with disabilities.

Based on Population Survey Data Inter-Census 2015 foreign conducted by the Central Statistics Agency, around 8.56 per cent or as much as 21.84 million residents, Indonesia, are the Contributors disabilities. Fulfilling Proper Access Will Make the fulfilment of the needs of persons with disabilities. The fulfilment of accessibility and job training has been carried out by one of the companies, PT. Indonesian Parakerja with Disabilities Can, with its superior feature, is learning Sign Language (Bisindo) basic through video media with various functional materials that have received approval from the Center Indonesian Sign Language (Pusbisindo) and The Deaf Welfare Movement Indonesian (Gerkatin)[7]. This application is intended for companies that will employ the deaf and parents and special school teachers to create an inclusive environment without a communication barrier. Through one of these breakthroughs, it is a form of developing accessibility for the deaf and the presence of translators on television broadcasts, live programs, subtitles, virtual technology reality, etc. These various accesses have their respective roles and benefits, which are dominated by visual communication.

### **3.2. Visual Communication Media**

Communication comes from the English language "communication" comes from the Latin "communications", which means sharing or belonging together. Communication is a process of exchanging information between individuals through a system of symbols, signs, or behaviour. Communication criteria that are effective, efficient and aim to include six supporting characteristics to say good communication and successfully achieve the goals of communication and social interaction[8]. These characteristics are explained:

1. Communication is a process; communication as a process entails a series of actions or events. Within the same timeframe, there are stages that are also related to one another.
2. Communication is an intentional effort and has a purpose in the sense that communication is an activity that is carried out consciously on purpose and following the goals or desires of the perpetrator.
3. Communication requires the participation and cooperation of all actors involved in successful communication activities. If one or more people are involved in the communication, the agency pays the same attention to the topic at hand.
4. Communication is symbolic, which means that it is an action that is carried out through the use of symbols. The most common symbols used in human communication are verbal language in

the form of words, sentences, numbers, or other signs.

5. Communication is interactive; communication necessitates two actions, namely giving and receiving; these two actions must, of course, be balanced and proportionate.
6. Communication penetrates the time and space factors, meaning that the participants or actors involved in communication do not have to be present at the same time and place with the existence of various communication technology products such as internet telephony and others which will become a factor of space and time which is no longer a problem in communicating.

The criteria for effective communication above refer to providing the delivery of good and appropriate information as needed. The communication used by the deaf is dominated by symbolic communication. Communication that involves visual media is shown through symbolic communication that occurs with the deaf, including the use of text translated into Indonesian Sign Language (BISINDO), photos and videos for various purposes, and the use of emoji[9]. Deaf has its language to communicate in face-to-face communication, namely sign language. This language is usually combined with hand, arm, and body gestures and facial expressions to express their thoughts. It hinders the creation of effective communication. The difference in language use between deaf and hearing people also makes deaf people a minority, so communication media creates two-way communication relationships by involving proper access.

### **3.3. Sign Language Interpreter**

Sign language interpreters who are often referred to as interpreters or sign language interpreters (JBI), are translating the speaker's language into sign language and vice versa, from sign language to non-sign language. A sign language translator is a person (hearing or deaf friend who can interpret sign language directly, precisely, and accurately, who has received sign language interpreter education from deaf organizations recognized by the local deaf community [10]. The development of communication for the deaf has been started since 2000. The role of Sign Language Interpreter began to develop in line with the Agreement on the Rights of Persons s with Disabilities as outlined in the Convention on the Rights of Persons with Disabilities (CRPD), Law no. 2011 concerning the ratification of the CRPD, and in 2016 Law Number 8 of 2016 has been enacted which emphasizes the rights of persons with disabilities to use sign language, sign language translators as accessibility.

In Indonesia, there is no official standardization from the government regarding sign language

interpreters. Someone is said to be a sign language interpreter when they are considered fluent in different sign languages and can communicate well with the deaf [10]. Indirectly, the sign language interpreter has not referred to the standards and requirements of professionalism based on scientific considerations of translation and interpreting experts. This sign language translator is not certified.

Through the Translation Expertise and Professional Services Group, efforts to recognize the role of JBI, the Language Development, and Development Agency through the Translation Expertise and Professional Services Group held a Pre-convention Workshop on the Draft of Indonesian National Work Competency Standards on 6-12 June 2021 at the Novotel Hotel, Mangga Dua Jakarta. The activity discussed five pre-convention texts, namely RSKKNI Deaf Sign Language Interpreter, RSKKNI Conference Oral Interpreter, RSKKNI Listening Sign Interpreter, RSKKNI Community Oral Interpreter, and RSKKNI General Text Translator. The SKKNI will be used as a reference to regulate the level of competence required by a professional with the principle of openness. The draft of the resulting standard of expertise applies to anyone [11].

Therefore, the criteria as JBI also need to be considered and studied in depth. JBI criteria can now be used as a reference of Gerkatin Sign Language Interpreting Service Center (PLJ) (Welfare Movement Tun a Deaf Indonesia). Meanwhile, the criteria for becoming a sign language translator according to the United Nations are as follows:

1. Meet the standard of sign language competence
  2. Comply with the code of ethics
  3. Have a good attitude
- [10].

#### **4. DISCUSSION**

The results of the library study show that accessibility in the fulfillment of deaf or hearing impaired disabilities is present in various public services. These services are provided so that people and people with deaf disabilities can obtain information together for equality and equality of information acquisition. The existence of such intermediary media makes information and knowledge easy to access, which is by article 16 paragraph 2 of government regulation no. 42 of 2020 that it is necessary to have easy access based on the principle of equality in diversity for people with disabilities.

The provision of accessibility for the deaf is also a variety of ways and forms, a form of accessibility that has been obtained quite a lot since 2017 in one of the national television broadcasts in the trans 7 afternoon editorial event and has been since 2010 in the

international television broadcast dominated by sign language providers or translators [12]. Sign interpreter (JBI) or also known as sign language interpreter (SLI), is a profession to help the deaf in translate words or sentences into the form of hand gestures so that the information submitted can be received by the deaf [13]. Mustarjudin's research explains JBI's role in Friday prayer sermons at Universitas Islam Negeri Sunan Kalijaga mosque has not been said to be effective due to JBI positioning, writing access, and lack of sign language skills from JBI.

The use of accessibility for the acquisition of information through mass media used in addition to using JBI with BISINDO, there are also other accesses developed in providing information, knowledge, and public services such as; augmented reality products, BISINDO-based lectures, and booklets [14], the use of subtitles or audio scripts [15], electronic hand gesticulation in the form of bluetooth gloves and speech bubble visualizations [16][17], as well as prototypes of other translator products developed in various countries. The use of accessible media has been widely found in various activities or activities such as mass media television broadcasts [12], learning activities [4][18], health services [19][20], social media accessibility [21], worship activities [22], online course for deaf [4], legal assistance in the constitutional court [23][24] and performing arts events [25]. The provision of this service will facilitate the equalization of information in diversity through the audio-visual [3].

Assessment service for sign language translators in america by obtaining a legal certificate. Assessments used with LAL. Language assessment literacy (LAL) stands for "the acquisition of knowledge, skills, and principles of test construction, test interpretation and use, test evaluation, and classroom-based assessment [26]. This means that the assessment of literacy and language skills is an acquisition of steps, skills, and principles of construction tests, interpretation tests, usage tests, evaluations, and classroom-based assessments. So that the assessment is done in a thorough manner. Another assessment is used to determine the ability of sign interpreters through bloom's taxonomy assessment with six stages [26]. First, starting from the lower level, is remembering. The recall includes items such as the following: list, explanation, or naming. The second level is understanding. This type of assessment is t for the interpretation of scripted tasks, including viewing the story and reproduction of the story, which demonstrates the ability to paraphrase and retell. The third level in bloom taxonomy is application. It is necessary to apply knowledge to utilize information, knowledge, skills, or techniques in new situations. The fourth level of blooms is analysis, to break information into its parts sequentially, and the fifth level of bloom taxonomy is evaluation, and this needs to provide feedback as a validity value. Creativity

ranks highest in cognitive processing in bloom taxonomy as ability development.

A survey on the effectiveness of using JBI was conducted in China. The survey findings explain that low understanding of sign language is currently interpreted in television programmes[27]. Given the fact that the difficulty of understanding mainly from the use of Chinese signs by the deaf from rural China, where educational resources are low and literacy rates are lower to face a much greater challenge. Another problem is that they are too fast in gesturing while their ability to understand sign language varies. The translator position is filled with teachers from local hearing schools, who are usually selected for their pleasant appearance and are considered relevant.

In post-survey interviews of 18 translators, the only translators who came from not a special school teacher background were three graduates of Zhengzhou University, which provides a sign language translator training program, who were hired to become JBI. Solutions for deaf well-being with residual hearing can be educated to truly understand the problem and enable deaf people to participate in the creation of programs aimed at them, making it appropriate and useful.

Knowing the effect of using text and transcripts on online media on television or video [28], Knowing the use of speech bubble visualization and prototypes over traditional texts for deaf and deaf conversations [17], Shared access services (text, audio description, and sign language) with VR360 content [29]. All of which create shared access services (text, audio description, and sign language). Studying deafness cues on social platforms, focusing on social content sharing and facial deafness barriers [30]. Therefore, the provision and availability of this service will facilitate the distribution of information in diversity through audio-visual [3]. The role of the interpreter is also needed to assist in gaining access to communication and information. Certification and Professional Interpreter[26] can help to access deaf get more information in mass media, live events, or other activities.

Collaborative and collaborative efforts in providing public services for people with hearing impairment certainly need to involve the active role of stakeholders, beneficiaries, and of course, supported by the right media as a form of providing appropriate accessibility for obtaining information every year. The use of mass media in the digital era is a solution that has begun to be developed with immersive technology as an effort to establish communication and social interaction.

## 5. CONCLUSION

The provision of accessibility as an appropriate medium and accommodation in obtaining information and knowledge of deaf people in various public services

has been carried out with the dominance of sign language translators[31], subtitles[29], [32], and also the latest assistive technological developments[33] that can accommodate such acquisition of comprehensive information. The selection of professional JBI through assessment and certification[26] needs to be realized in Indonesia so that the provision of public services is accurate, useful, and can be accessed effectively. Therefore, the fulfilment of the right to obtain information and knowledge must continue to be developed collaboratively and mutually beneficial for the creation of communication relationships, synergistic social interactions. The provision of visual access can be developed for all mass media activities that are broadcast publicly; augmented reality with sign language or subtitles will make it easier to describe the understanding of meaning in a situation and condition. Thus, using technology-based social media, informative writing, visualization will make it easier for the deaf to find and get access to information and communication.

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