

The Deaf and Graphic Design Education: Figuring the Challenges of the Sign Language Interpreter

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Abstract: This paper stems from preliminary observations of hearing-impaired students and interpreters at the Department of Graphic Design in the University of Education, Winneba. The study examines the challenges faced by the department's sign language interpreters with mixed backgrounds interpreting graphic design courses. The helper and facilitator models guide this study theoretically. Adopting a qualitative approach with a case study method, data is gathered from two interpreters through a face-to-face interview. Data is further analysed using thematic data analysis. With supportive pieces of evidence, some challenges faced by interpreters were identified. Interpreters without graphic design background were found to process some unqualified information; the lack of the adaptation of visual cues, unavailability of structured concepts for interpreter use, unavailability of note-takers, the lack of recognition of the hearing-impaired by some lecturers and fast-paced lecture delivery were also identified. However, the study recommends an initiative of lecturers inquiring about hearing-impaired students at lectures to affect pace of lecture delivery, the provision of note-takers, the addition of visual cues in lecture delivery, and the design for structured concepts to be used by the department due to the practicality of courses offered. Moreover, this improves the pace of lecture delivery in the practice of inclusive education.

Keywords: Graphic Design, Hearing Impaired, Sign Language Interpreter, Challenges

1. Introduction

Communication is a critical aspect of everyday human interactions. These interactions are done via verbal or non-verbal forms of communication. However, the non-verbal forms of communication between the deaf and the normal-hearing individuals can be complicated in most environments. The educational settings are no exception, especially when both Deaf and normal-hearing individuals (students) are educated together in the classroom [1, 14]. Deafness is a "hearing impairment which is so severe that the individual is impaired in processing linguistic information through hearing, with or without amplification which adversely affects educational performance. In this regard, a sign language interpreter acts as a bridge between the instructor (lecturer) and the deaf student to deliver information [3]. Communication needs of deaf students and the teaching practices in a typical oral-only classroom are potential difficulties with inclusive education. In Ghana, the Deaf has the right to pass through education just like every

other individual without any deficiency (special needs). Their rights extend to the expectation of their needs and human, linguistic and educational rights, which is respected and supported by educational authorities in Ghana.

The University of Education, Winneba (UEW) also offers inclusive education opportunities for prospective students through Special education to equip them with practical knowledge and skills to teach pupils and students with special educational needs (SEN) in special and inclusive schools.

The Department of Graphic Design (DGD) under the School of Creative Arts at UEW provides students (deaf and normal hearing individuals) to be trained in Graphic Design. Preliminary observation at the Department of Graphic Design revealed that deaf students are provided with sign language interpreters to assist them at lectures. In most cases, interpreters from another department (Department of Special Education (DoSE)) are received to interpret Graphic design lectures. However, some of these interpreters lack the knowledge and experience in Graphic design. The rippling

effect encountered in their interpretation of lectures reflects low examination and projects scores compared to their hearing peers. Again, some interpreters are also unsure with Graphic design terms and meanings, leaving the Deaf students with uncertainty only to watch fellow students who can hear busily listening and making notes. This confirms the studies of Jacobs [4] and Spradbrow & Power [5], whose similar studies identified that deaf students do not receive as much information from classroom lectures as their hearing peers.

Per these observations and an interest to promote and make better inclusive education in Ghana, it becomes vital to think through all aspects of inclusive education. This, with which sign language interpretation and their related challenges is no exception. This study gives attention to sign language interpreters contextually to understand their role and encounters, especially at the DGD, with interpreters of mixed learning experiences in the practice of inclusive education. The study sought to investigate the challenges of these interpreters who are relied upon during lectures to channel information to the hearing impaired students. This study is essential as it explores how the interpreters fathom and communicate with deaf students during lessons at the Department of Graphic design at UEW. From this perspective, their challenges would be revealed as the necessary inputs to help educate the deaf, and the typical hearing individuals pursuing Graphic design would be explored. This goes a long way so both normal hearing and hearing-impaired (HI) students can equally benefit in their education to becoming graphic designers and enhancing the dynamics of practising inclusive education.

2. Theoretical Dimension

2.1. Graphic Design Learning Module

Ibrahim, Alias & Nordin [1] puts forward the Graphic design learning module as an integrated module equipped with learning resources to study graphic design. The module is used by most Design institutions and primarily is also adopted by DGD at UEW. The Graphic Design Learning Module aims to develop a practical understanding of the essential graphic language tools, principles, theories and practices of the visual communication design process, including composition, colour, typography and image. Aspects of type and image for graphic design covers varied visualisation processes underpinned by principles of visual communication. It enables the student to experiment with mark-making, image production, photography and printmaking.

Media and Communication Technology courses orient students studying Graphic design in the use of software in the production of page design for web and print, providing the opportunity to research and develop practical computing skills in the use of industry-standard software like Adobe Photoshop, Adobe Illustrator, Adobe Dreamweaver, Adobe InDesign etc.

Integrated Graphic Studies allows students to apply and articulate the concepts and theories learned in earlier modules

to explore and develop their creative pathway. It requires the selection of interests to consolidate a pathway through the course. For example, at the DGD at UEW, students can select from three tracts; Advertising, Multimedia and Graphic design. Focusing on these tracts leads to the module's internship segment to prepare students for the world outside what they practice in school.

2.2. Model Perspectives: The Interpreter's Role

In search of a supportive theory or framework to support this study, it was discovered that less attention is given to interpreters of specific disciplines and their challenges. Theories in that regard were almost non-existent. From a different viewpoint, in an attempt to understand the interpreter's challenges, the interpreter's role was studied using selected interpreting models to analyze the interpreter's role. This is intended to give a richer view of the phenomenon under investigation. Dodzik [6] asserts that adopting interpreting models for interpretive studies is relevant to helping analyze the work, separate the investigator from work to being investigated, and help us talk to each other. That is the source to the interpreter and the Deaf. The Helper Model and Facilitator Model finds a theoretically accepted understanding of the interpreter's role and, hence, is considered for this study.

2.3. The Helper Model

The helper model expounded by Berge & Ytterhus [7] identifies the interpreter as a helper for the deaf/HI person. The idea that deaf persons could use an interpreter to represent themselves was also based on the assumption that they needed help interpreting their views and that of the normal hearing individuals. The rights of the deaf person were then limited. In response, sign language communities demanded that interpreters be made available to provide unbiased information and services to the deaf community. Most interpreters were codas, clerics, or social workers [8]. Despite the limitation of this model at the pre-professional stage, the interpreter per this context is positioned as a helper. Therefore, in the failure to provide help, a challenge is imminent, especially on the side of HI individuals. Despite the limitation of this model at the pre-professional stage, the interpreter per this context is positioned as a helper. Therefore, in the failure to provide help, challenges would be eminent, especially on the side of HI individuals.

2.4. The Facilitator Model (The Bi-lingual Model)

The facilitator model was introduced at the end of the 1990s. However, the model's perspective emphasizes that various strategies are at the interpreter's disposal, and the most effective strategy is not given. The interpreter's evaluations of what is said and done will influence their mediation. Therefore, the interpreter is neither invisible nor neutral, and their presence will affect the participants' dialogue [9]. The model again indicates that the interpreter's responsibility is connected to language mediation and coordination of interaction [10]. From this exposition, it is

clear that the interpreter is a language mediator. However, a mediation that relies on what the interpreter will sign and do should be factored with knowledge of the message or instructions received to interpret. Although the fundamental aspect of specific knowledge can be interpreted, deeper insights, expressions, and focus on language could result in an optimum understanding of the message delivered to the Deaf. Possible mediation challenges can arise if these details are not given the attention it deems.

2.5. Literature Review

2.5.1. Constraints of Deaf Students in Higher Education:

Sign Language Interpreter Account

Carrerforce [11] Identifies the Deaf as people who have a hearing impairment, usually identifying themselves as part of the Deaf community. They are likely to use formal sign language as their first language. Some scholars Ibrahim, Alias & Nordin [1] and Yahya-Isa [12] acknowledge that Deaf students tend to study in higher institutions. However, there are some constraints faced. Amongst them are; the inefficient technology used for learning, negligence of deaf students, learning styles, and the sign language interpreters who are not experts in some particular fields. This brings to account that sign language interpreters add to the number of constraints that hinder the Deaf from pursuing their academic dreams. However, the constraints put forward by the authorities are researchable in exploring the complexity of the findings revealed from their study [13]. For example, Lang [13] shares that on the ticket of constraints identified sign language interpreters (who are not experts in a chosen field of study) to process somewhat or unqualified information to the Deaf who might be prepared to study. Such conditions explored present a flesh to the current body of literature on interpreters and deaf students learning pursuing programs of study in higher institutions. In practice, Ibrahim, Alias & Nordin [1] and Saide et al. [14] acknowledge that the interpreter should interpret the language presented for the hearing impaired. However, interpreting services are from volunteers and individuals who might not be available for a more extended period for teaching and learning situations usually results in a poor understanding of the content and context of learning.

In a study, Saide et al. [14] used a highly skilled interpreter and Deaf students whose grade point average was comparable to that of hearing peers. Tests of immediate recall of short-term lecture content indicated that the deaf college students correctly answered about 84% as many items as the hearing students. Significant differences favoured the hearing group in five of the six subtests. Contrary to a different study by Lang et al. [15], it was revealed that deaf college students learning Science through a skilled interpreter scored approximately twice as high as those learning through an unskilled interpreter. It can be suggested from the studies that there is a dire need to evaluate the relationship of interpretation to learning. DeGroot [16] and Winston [17] draws attention to familiarity with the content of a study to lead to more appropriate sign selections and fewer

misinterpretations of a lecturer's lecture emphases. In addition, an interpreter knowledgeable of the specialized vocabulary and proper names associated with a particular discipline may be more accurate and facile in conveying the presenter's information.

2.5.2. The Deaf and Graphic Design Education

Easterbrooks & Stoner [18] assert that deaf people are visual learners and should be taught visually and aesthetically by nature. In analysing the term Graphic Design, Graphic design is a branch of visual art that concerns communication with the public. It encompasses visual images such as letters, photographs, symbols, colours, and drawings [19]. Through Graphic design education, the individual becomes a Graphic designer who employs these visual images in creating various communication media to inform, educate, warn, advertise or give information about products and services. The exposition revealed by Adom [19] recognises Graphic design as a communication medium that visually presents itself. In the case of Deaf being visual learners, as acknowledged by Easterbrooks & Stoner [18], education in Graphic design can then contend that the Deaf could see and adhere for better comprehension in studies in Graphic design education. The recognition of the absence of auditory feedback essential for speech becomes the most handicapping means to students who are deaf and therefore require visual teaching [20]. It suggests that students who are deaf could learn to rely on visual cues for information.

3. Methodology

The nature of the phenomenon investigated called for an in-depth understanding of interpreters' perspectives to denote their challenges. This initiated the idea of adopting a research approach that aims to support the basis of unveiling in-depth. Per this context, Myers [21] identifies the qualitative research approach as adopted to help researchers understand people and the social and cultural contexts within which they live. However, a case study as a qualitative method of investigation was chosen considering the purposeful interest of the study in a particular department. The case study is of interest to this study. A case study's adoption makes possible the identification of variables, structures, forms, and orders of interaction between the participants in the situation [22].

Data were obtained from two interpreters from the Department of Special Education and the Department of Graphic design (DGD) at UEW. The sample was selected purposively based on their direct knowledge of the inquiry. Data was gathered from responses through a face-to-face structured interview aided with an interview guide. Palmer & Bolderston [23] explain interviews to offer the possibility of gaining insight into the interviewee's world and a deeper understanding of the nature or meaning of the interviewee's everyday experiences.

According to Vaismoradi & Snelgrove [24], qualitative data analysis requires all sorts of data materials to be transferred to textual format as transcription and are read

several times to achieve the sense of a whole, to explore the central meaning behind the data and trace back-related ideas for understanding hidden concerns in the data. The researcher focused on bringing himself close to the data by transcribing raw data, highlighting main ideas as codes related to the phenomenon. This leads to the generation of categories and, finally, themes through constant comparison of the codes.

4. Results

The results from analysing data from the interview were presented under themes as follows;

4.1. Interpreter Perspective on Graphic Design Courses

The theme's essence was to establish an acceptance by the interpreters that Graphic design courses have dimensions of being interpreted. This position was necessary because it institutes the underpinning reason for Graphic design courses being interpreted for the HI to acquire helpful information and skills in their training to become graphic designers. From this perspective, adopting pseudo names, Gody, a graphic design graduate and sign language interpreter at the DGD (first interviewee), revealed by sharing that;

"Yes, Graphic design courses can be interpreted. So me being an interpreter now like this, I have exposure to the courses. I can sign the majority of what lecturers say because I first have an in-depth understanding of the courses. I sign these in concepts to the HI students."

Moha, the second interviewee from the Department of Special Education (DoSE) who also signs at the DGD, shared his view. It was noticed that Moha's basis of accepting that design courses could be interpreted was based on his understanding which he signs in concepts to the HI student;

"Yes, design courses can be interpreted. It would depend on who is interpreting. What I do is that I use my understanding to interpret. So at a point where I don't get what the lecturer is saying, that is me not understanding, I have to pause and ask the lecturer what he means for me to sign."

A key finding revealed from the two base categories of sign language interpreters at the department is that design courses can be interpreted. However, exposure and in-depth on the subject discussed by the instructor is required for understanding to sign. On the take on personal understanding of what the lecturer is saying as expressed by the interpreter from DoSE, a link was identified from responses in inquiring if interpreting Graphic design courses calls for first having a background in the Graphic design field. It was to form grounds to accepting Moha's view. Moha was explicit as he indicated that;

"Not necessarily a background, but an idea on what design is. For example, while signing for the course Brand and Corporate Identity course, we got to a part that had to do with finance. Thus how to budget for etc. and the issue of costing came in at that point that was my first time signing for the department. But when we got to this section, it felt like I already knew what we were talking about. Nevertheless, even

at the start of the lecture, I did not know it was Brand and Corporate Identity."

Gody from DGD also revealed profound findings establishing his inputs from foundational studies at Senior High Schools (SHS). Gody believes that several subjects studied at SHS expose the deaf to many signed concepts, thus from the elements and principles of design to its use in the rendering of artistic works. The intense exposure to this foundation communicated through sign language in concepts helps the HI student connect with artistic reflections. From a common background for the interpreter and the HI student, sign language becomes manageable and comprehensible. The HI students can quickly reflect and understand concepts when used in sign language. Gody from DGD was very emphatic as he shared that;

"It is very important for a sign language interpreter to first understand Graphic design before proceeding to sign for the hearing impaired. I believe that background is required, and it helps you, the interpreter as well. The foundations at the Senior High, especially in Visual Arts, are much depended on at the tertiary."

Moha's did not accept to have a background necessarily. He was further probed to seek to find out his basic understanding of Graphic design. Moha, from his response, had a different viewpoint of what Graphic design is as an area of study. He, however, indicated that Graphic design is an area that has specific terminologies. He went further to indicate that Graphic design is not about the English language. Additionally, Moha shared that he finds Graphic design to be Science and Information Technology (IT).

"To me, Graphic design is Science in a way. The Science of IT and Art combined but for other courses, for instance, Basic Education is mostly English. Graphic design courses I have interpreted mostly have many terminologies. A word may be mentioned, and you know that oh maybe focus means attention. Then in Graphic design, while signing for a photography course and they say focus and at that point is not about attention but has to do with a state of the function of a camera's lens."

From these interpreter perspectives, it can be put forward that these two interpreters exist on different tangents on how they understand Graphic Design as an area despite performing a typical sign language interpreter job. However, Gody's viewpoint as an interpreter and graduate in Graphic design is understood to give him an upper hand in first understanding what lecturers say in depth before signing to the HI students. Gody shared that,

"Graphic design courses can be interpreted; however, the know-how of the interpreter matters in the area of providing sign language assistance."

Gody's input exposes interpreter selection as a direct challenge for the HI students to deal with. From an extreme position, this is sensed to trigger interpreter challenges. This finding supports a finding of Lang [13] shares that sign language interpreters who are not experts in a chosen field of study to process somewhat or unqualified information to the Deaf who might be prepared to study.

4.2. Sign Language Interpreter Challenges

In identifying some challenges expressed by the interviewees of this study, it was identifiable that the sign language interpreters' challenges were centred on lecturers and the HI students. Interpreters expressed a worrying and dissatisfactory observed situation they encountered at lectures. Gody, our first-person interviewee, voiced out about the pace of delivery of lecturers. In a worrying mood shown, Gody lamented;

"hmm sometimes eerh how some lecturers move. Their speed in the lecture delivery, well I don't think they remember we are part of the class. You know, for the Deaf, their words are like broken English like 'go, come', 'go, come' so after all his sayings you need to need to quickly put all together summarize to get the idea and sign for the Deaf. Usually, when it happens that way, you cannot catch up as an interpreter."

This concern was reiterated by Moha, the second interviewee from DoSE, who gave some dynamics to the observed challenge. Moha averred that some lecturers do not regard them, thus both interpreters and HI students. In an attempt to talk with some lecturers who would either talk fast or not speak that loud to be heard to interpret, upon request, they come closer and usually talk for a while, but within a few minutes, they revert to their fast-paced lecture delivery.

"Doc, Sir, he comes closer to where you are with the hearing impaired students and goes back in a few minutes. Some make you feel you are worrying them as you prompt them of their speed of delivery. You only try to adjust. That is, what you hear is what you sign."

Another concern put forward by the interpreter, Gody, was the nature of some lectures that fail to add visual cues to complement teaching and learning. He narrated how some courses could have some aids such as videos, diagrams, images, or PowerPoint presentations that could have been used to help the hearing impaired. The input from Gody is in line with Easterbrooks & Stoner [18], who agree that deaf people are by nature visual learners. Hence, without these aids, it becomes difficult for interpreters almost to interpret the many words in concepts to share with the HI student. Gody was of the view that;

"Over the years signing for the hearing impaired, I have realised most of them are slow in terms of understanding. So even if you explain, some get confused, and they will be asking questions after you interpret. And of course, lecturers don't wait for us so that the HI students would miss out. But if there are visual cues, it makes understanding quiet faster. It informs how I interpret, making it easier for the hearing impaired students to get what am saying and what is being signed about."

Moha revealed another challenge centred on the department's inefficiency in furnishing sign language interpreters with semester courses details. Indicating this is for both current and future courses handled at the department, Moha's expression of this challenge suggested their feeling as interpreters. From the communication, he feels they are not inclusive in the teaching setup of the department. Moha again was explicit as he lamented that;

"we as interpreters have a challenge with the changing of courses among us. That tells it all... like we are not active staff like everyone around. So you can be called to interpret any course at any time. Sometimes, you are called and quickly you have to organise yourself and deal with the situation. Sometimes you feel this is above you (sorry to say) but you are requested so you should be there... you have no idea for current or later courses for other semesters to interpret. How do you even deliver?"

Moha from DoSE also indicted a critical challenge as sign language interpreters' unavailability of structured concepts. He was of the view that most institutions that practice inclusive education have structured concepts. Thus, all interpreters know and understand an accepted language (signed concepts) within the community they find themselves in. Moha revealed he had not encountered any as he was not aware of such. Moha went further to indicate the inclusion of note-takers to make notes for the HI students.

"I am not aware as an interpreter if we have concepts known to this community of sign language interpretation in this university. I have my own way of signing every word being said at a lecture. So, today am interpreting for Antoinette with my known concepts for certain words. Now tomorrow, another interpreter comes in to sign for the same person, and he creates his own signs. Usually, what happens is that while the lecture is ongoing, the HI student (s) and myself, as an interpreter, will be disagreeing on my signed concepts from the lecture. Some will argue. Usually, the HI student misses out, especially as there is no note-taker for the HI student to cover up what he/she missed."

The submission made by Moha suggests that interpreters adopt certain signed concepts best known to themselves and students to boost their level of comprehension to lecture delivered. To Moha, this tends to offer flexibility for interpreters to interpret lectures easily.

5. Discussion

The present study was designed to investigate the challenges of sign language interpreters from DGD at UEW. The study emphasized sign language interpreters as skilled and certified professionals who convey information to HI students and are relied upon during lectures. On this supportive basis, the study specifically focused on how the interpreters communicate with deaf students and the challenges encountered that hinder their functioning. This study, from its finding, discovered that interpreters without graphic design background were found to process some unqualified information to HI students. This was evident from the submission from the interpreter who had no graphic design background yet interprets Graphic design courses. This finding further supports the idea of Wilcox & Shaffer [25] who draws attention to sign language interpretation. Wilcox and Shaffer [25] identify words and signs to have an inherent meaning. That is something that they always mean. Accordingly, Wilcox and Shaffer [25] hold the view that an interpreter only has to decode the inherent meaning of a

word/sign and then re-code that meaning in words/signs from another language. In keeping with this, the task of an interpreter is to interpret what somebody has said. Comparing this to the finding in the discussion, it suggests that an interpreter who does not know much of a particular field (in this case without a design background) could process somewhat unqualified information to HI students. An interpreter here may not fully decode the inherent meaning of a word used (which could be a graphic design term) by an instructor and re-decode that meaning into a sign. It is appreciable to know that content knowledge is highly valued by deaf students and teachers. Interpreters should function as a bridge to relay the knowledge. In addition, the accuracy and effectiveness of interpreting may depend on content knowledge [15]. Therefore, that absence permits the building of similar 'real space blends' with types of common knowledge [26], which might not be a true reflection of words used.

Another finding of this study reveals the lack of adaptation of some lecturers' visual cues, affecting how the HI students receive information. This finding corroborates the finding of Easterbrooks & Stoner [18], that deaf people are visual learners and should be taught visually and aesthetically by nature. Again, the present finding seems to be consistent with other research of, which found deaf students to have similar interests to hearing students. The research exposes the challenge this current study reveals. Thus, possibly to be resolved as a need of the HI students. The students from the study valued professors who were well-versed in the course material and used visual materials that communicate expectations and assignments, lecture at a good pace, make sure students understand, challenge students' thinking, and emphasize important information in the class [27].

Interestingly, this finding from Lang [27] is consistent with other findings of this study. Particularly with revealed challenges on fast lecture delivery by lecturers and unavailability of structured concepts for interpreter use. Lang [27] submission found HI students to expect a good pace of lecture delivery, the provision of structured concepts to ensure students understand lectures delivered to challenge students' thinking.

6. Conclusions and Recommendations

This study sought to investigate the challenges experienced by sign language interpreters at the Department of Graphic Design in the University of Education, Winneba. Identifying the challenges stems from observation on the inclusion of sign language interpreters from other departments (Department of Special Education) concerned with the training of students to offer special attention to students with special needs. The study revealed that the interpretation of Graphic design courses is dependent on the interpreter's knowledge looking at the practicality of the courses. It was discovered that some interpreters who do not know the field of Graphic Design process somewhat unqualified information to the HI students. A challenge revealed was the non-inclusion of visual cues in lecture delivery by some lecturers, which becomes an

abstraction to the HI students especially noting that these HI students are visual learners who depend on visual cues and their integration in inclusive education. Issues of fast-paced lecture delivery by lecturers, interpreters lacking course materials and details, unavailability of structured concepts developed to be used by the department, and the non-existence of note-takers were among challenges revealed by the study.

From these findings, however, it is recommended that; the institution in its practice of inclusive education should properly integrate the services of sign language interpreters for various academic departments. Specifically, for the DGD, there is a need to team up the DGD and DoSE to draft and adopt some form of concepts to be used specifically for the department's interpreters based on the nature of courses handled. If done, this will be in the effort of maintaining consistency in the delivery of sign language.

Additionally, sign language interpreters can share teaching materials and tutorials to understand upcoming lectures properly. The interpreters should be adequately integrated into the teaching setup to be aware of current and future courses to be interpreted.

Lecturers should make an effort to find out if their HI students in various lectures handled. This initiative would inform lectures of the present HI students and inform lecturers on their delivery pace, especially knowing the lecture is interpreted. Again, it would inform lecturers to be repetitive in the delivery of lectures. In accepting sign language interpreters to attend the lecture with note-takers, which is also a recommendation, repetition of lecture contents would help the note-takers make enough notes for the HI students.

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References

- [1] Ibrahim, Z. Alias, N. & Nordin, A. B. (2016). Needs analysis for graphic design learning module based on technology & learning styles of deaf students. *Cogent Education*. 3, 1–14.
- [2] Saide, S., Ramadhani, S. S., & Indrajit, R. E. (2015). Improving Creativity of Graphic Design for Deaf Students Using Contextual Teaching Learning Method (CTL). Retrieved: October, 23, 2021, from https://www.researchgate.net/publication/325943027_Improving_Creativity_of_GraphicDesignfor_Deaf_Students_Using_Contextual_Teaching_Learning_Method_CTL
- [3] Kigotho, L. W. (2016). Barriers faced by students with hearing impairment in inclusive learning environment, a case of the University of Nairobi. (Published Master's Thesis, University of Nairobi, Kenya). Retrieved from: <http://erepository.uonbi.ac.ke/bitstream/handle/11295/98908/Kigotho>.

- [4] Jacobs, L. (1977). The efficiency of interpreting input for processing lecture information by deaf college students. *Journal of Rehabilitation of the Deaf*, 11, 235–247.
- [5] Spradbrow, G., & Power, D. (2000). Slipping through the cracks? The support needs of hard of hearing students in a university program. Paper presented at the 19th ICED Congress, Sydney, Australia, July.
- [6] Dodzik, C. (2013). Interpreting models. Retrieved: October, 23, 2021, from https://www.slideshare.net/CynthiaDodzik/interpreting-model-s-2?from_action=save.
- [7] Berge, S. & Ytterhus, B. (2015). Deaf and hearing high-school students' expectations for the role of educational sign-language interpreter. *Society, Health and Vulnerability*. 1-26.
- [8] Bar-Tzur, D. (2019). Interpreting Service Models. Retrieved: October, 20, 2021, from <http://wp.lps.org/sshacke/asl-interpreting/interpreting-service-models/>.
- [9] Napier, J. (2002). Sign language interpreting: Linguistic coping strategies. Coleford: McLean.
- [10] Roy, C. B. (2000). Interpreting as a discourse process. New York, NY: Oxford University Press.
- [11] Carrerforce. (2009). Describe and use visual strategies for communicating with Deaf and hearing impaired people. Retrieved: October, 23, 2021, from <https://hsdc.org/services/deaf-101/>.
- [12] Yahya-Isa, S. (2004). Against all odds. Penang: Forda Printing. Sdn. Bhd.
- [13] Lang, H. G. (2002). Higher education for deaf students: research priorities in the new millennium. *Journal of Deaf Studies and Deaf Education*. 7 (4) 267–280.
- [14] Saide, M., Rahmat T., Hsiao, L. W., Okfalisa., and Wirdah, A. (2017). "Knowledge sharing behavior and quality among workers of academic institutions in Indonesia". *International Journal of Business and Society*, 18 (2), 353-368.
- [15] Lang, H. G., Biser, E., Mouseley, K., Orlando, R., & Porter, J. (2002). Tutoring in higher education: perceptions of deaf students, tutors and teachers. Manuscript submitted for publication. <https://academic.oup.com/jdsde/article-pdf/7/4/267/9835869/267.pdf>.
- [16] DeGroot, A. M. B. (1997). The cognitive study of translation and interpretation: Three approaches. In J. W. Danks, G. M. Shreve, S. B. Fountain, & M. K. McBeath (Eds.), *Cognitive processes in translation and interpreting* (pp. 25–26). Thousand Oaks, CA: Sage.
- [17] Winston, E. A. (1995). An interpreted education: Inclusion or exclusion? *Gallaudet Research Institute Occasional*. 94 (2) 55-62.
- [18] Easterbrooks, S. R., & Stoner, M. (2006). Using a visual tool to increase adjectives in the written language of students who are deaf or hard of hearing. *Communication Disorders Quarterly*, 27 (2), 95–109. doi: 10.1177/15257401060270020701.
- [19] Adom, D. (2017). Graphic design for senior high schools. Retrieved: October, 23, 2021, from <https://www.researchgate.net/publication/317177158>.
- [20] Obosu, G. K, Adu-Agyem, J. & Opoku-Asare, N. (2013). The use of visual art forms in teaching and learning in schools for the Deaf in Ghana: Investigating the practice. *International Journal of Innovative Research and Development*. 2 (5) 408-422.
- [21] Myers, M. D. (1997). Qualitative research in information systems. *MIS Quarterly*. 21 (2) 241-242.
- [22] Rebolj, A. B. (2013). The case study as a type of qualitative research. Available from: https://www.researchgate.net/publication/265682891_The_case_study_as_a_type_of_qualitative_research [accessed Oct 28 2021].
- [23] Palmer, C. & Bolderston, A. (2006). A brief introduction to qualitative research. *The Canadian Journal of Medical Radiation Technology*. 16-18.
- [24] Vaismoradi, M., & Snelgrove, S. (2019). Theme in Qualitative Content Analysis and Thematic Analysis. *Forum Qualitative Sozial orschung / Forum: Qualitative Social Research*, 20 (3). <https://doi.org/10.17169/fqs-20.3.3376>.
- [25] Wilcox, S. and Shaffer, B. (2005). "Towards a cognitive model of interpreting." In Terry Janzen (ed.) *Topics in Signed Language Interpreting: Theory and Practice*. Amsterdam/Philadelphia: John Benjamins Publishing Company. 27–50.
- [26] Liddell, S. K. and Vogt-Svendsen, M. (2007). "Constructing spatial conceptualizations from limited input: evidence from Norwegian Sign Language." Amsterdam/Philadelphia: John Benjamins Publishing Company. 173–194.
- [27] Lang, H. G., Mckee, B. G., & Conner, K. N. (1993). Characteristics of effective teachers: A descriptive study of perceptions of faculty and deaf college students. *American Annals of the Deaf*, 138, 252-259.