The Academic Learning Process: Deaf and Hard Hearing of Polytechnic Students Share Experiences in a Phenomenological Study

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Abstract

The number of Deaf and Hard Hearing students coming to the polytechnics has been increasing for the past years. The problem is that they may not have the benefits of a Deaf and hard of hearing culture in the polytechnic as compared to pre-tertiary life. The aim of this paper was therefore to explore their experiences in their academic learning process on a polytechnic campus. Appropriately a phenomenological approach to the study was chosen. The main data collection was an in-depth interview. After analyzing the data through a rigorous coding system, four categories were adopted in presenting the results. The results showed that though they had some challenges, their cognitive elements pointed to potentially good students given that some appropriate measures are taken by the polytechnics and the ministry of education. Some theoretical and practical implications for research were put forward at the tail end of the study.

Key words: Deaf and hard hearing students, social cognition, phenomenology, Ghana, polytechnics.
1. Introduction

The number of deaf and hard of hearing (DHH) students in the polytechnics in Ghana has been increasing for the past years. In the Koforidua Polytechnic for example, ten of such students had been admitted as at the end of December, 2015. The problem is not the numbers because when expressed in percentage terms, the ten of the total number of students is minuscule. The issue is that their pre-tertiary educational conditions are different from that of tertiary conditions. For example, the schools for the DDH in Ghana are resourced with the necessary materials and appropriate staff unlike that of tertiary. Therefore, DDH may not encounter the kind of culture which befits them. Thus the aim was to explore their experience on a polytechnic campus. This paper is the first of its kind in the sense that it has never been done in the kind of context.

Hearing students have the benefits of all the four preferences of learning, namely: visual, aural, read/write and kinetics (VARK) as posited by Fleming (2001).

The DHH do not have the benefit of one of the four preferences, that is, audio. Thus, there are cognitive differences in the DHH and the Hearing which can affect their language comprehension, literacy and learning (Marshark, 2015). According to him the cognitive differences are likely to be in the area of memory, visual information processing, concept learning and knowledge organization. In Ghana there are special schools for the Deaf in all the regions. The schools are staffed with teachers who use the appropriate methods and materials in teaching the Deaf. According to the officials of the School for the Deaf in Koforidua (in Ghana) most children who are deaf are sent to the schools in their early age. The ten students in the polytechnic were no exception. They all attended the special school for the deaf before joining the polytechnic. The issue is that the teachers in the polytechnics in Ghana do not have the appropriate skills in teaching the DHH.

Writing an article based on the topic *social cognition and theory of mind* in *Communication Considerations A to Z™*, Doctor Brenda Schick took the position that

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1 Communication Considerations A to Z™ is a series from Hands & Voices
Deaf and hard-of-hearing students are at risk for delays in social cognition. Also skills in social cognition affect social interaction. As well, skills in social cognition can affect academic learning.

1.1 The problem statement and motivation for research

The DHH have a limitation in the learning process as compared to the Hearing. The Hearing have all the benefits of the learning preferences whilst the DHH lack one in a learning environment. Yet they have to compete with the Hearing in the same learning environment for good grades. Given the circumstances we were motivated by the need to discover the strength of the DHH in the learning process.

1.2 What is DHH?

Deaf and hard of hearing has a technical definition. The American National Standards Institute (1989) gives the following indicators as the level of deafness.

- 15-30 dB HL, mild hearing loss
- 31-60 dB HL, moderate hearing loss
- 61-90 dB HL, severe hearing loss
- >90 dB HL, profound hearing loss

Thus a deaf communicator may not necessarily be completely deaf. Such person may be described as hard of hearing. Goss (2003) illustrates it better that if a phone is ringing, a person with mild hearing loss is likely to notice it after some time, a person with a moderate hearing loss may need assistive listening devices (hearing aids, amplifiers, FM systems) to hear it, a person with severe hearing loss can hear it only with the help of assistive listening devices, and a person with a profound hearing loss may not hear the phone even with assistive listening devices.

1.3 The purpose of the study

The purpose of this article was to describe the experiences of DHH Students in the learning process in the polytechnics, using the Koforidua polytechnic as a case study. The study was narrowed to a learning process that affects academic work or performance. It might be an event, activity, procedures, systems or any other factors that has a bearing on the DDH’s learning process. It is important to do this study in order to get a deeper understanding about the phenomena and thus suggest practices and policies based on tertiary education. Also, this work will fill a gap in the scholarly literature.
The rest of the article follows in the order of: formulation of research questions, the methodology, the analysis of results, discussions and conclusions.

1.4 Research questions

The following central research questions were addressed:

1. What are the experiences of DDH in the Academic learning process?
2. What contexts or situations influence or affect DDH’s academic learning process?

This was followed by the following procedural questions (Creswell (2007 p 110).

1) What statements describe these experiences?
2) What themes emerge from these experiences?
3) What are the contexts and thought about these experiences?
4) What is the overall essence of the experience?

1.4 Review of the relevant literature

1.4.1 Aims of the literature review

The major aim of the paper was to get a good understanding of the experiences of the DDH in the learning process. To better understand the structure of the subject (Hart, 1998) we adopted theoretical frameworks relating to the processes and development of learning.

1.4.2 Relevance of theory

Theories provide complex and comprehensive conceptual understandings of things that cannot be pinned down: how societies work, how organizations operate, why people interact in certain ways (Reeves, 2008). Creswell (p 131, 2003) added that theory is used by qualitative researchers as a broad explanation for behavior and attitudes, and it may be complete with variables, constructs, and hypotheses. We add that they may also provide priory themes for qualitative studies. The three major theories used in assisting us to better understand the phenomena, were Social Cognition, Learning Domains and Ecological Theory.

1.4.3 Social Cognition (SC)

Reeves (2008) posit SC as our ability to understand the attitudes, beliefs, values, desires, and knowledge of others. Khan et al (2014) views SC as consisting a wide range of cognitive abilities that are critical for social functioning (for example, ability to recognize social cues, deduce mental states of others, evaluate social context, and
understanding emotions). Pijenborg et al (2009) cited Brothers, (1990) as having defined SC as mental operations underlying social interactions, which include the human ability and capacity to perceive the intentions and dispositions of others. They also identified Theory of the Mind and Emotion Perception as two aspects of SC. They cited Couture et al (2006) as having defined Emotion Perception as the ability to infer emotion from facial expressions, vocal inflections, or a combination of both. They in turn cited Premack & Woodruff, (1978) as having defined Theory of the Mind as the ability to infer mental states and to understand that they can be used to predict others behavior.

1.4.4 Learning Domains
Learning domains are the areas in which learning takes place. The literature on learning domains is credited to the works of Benjamin Bloom and his research team. They identified the cognitive, the psycho motor and the affective domains.

1.4.4.1 Cognitive Domain
This learning domain is obtained from instruction and is associated with the intellect of the student. Bloom (1984) identified steps in the cognitive domain as follows:

1) Knowledge through remembrance of the past
2) Comprehension through understanding the meaning of words
3) Analysis through breaking of the information remembered and understood into parts
4) Synthesis through putting together the information broken into parts and
5) Evaluating through using standards and criteria to judge the value of the information synthesized.

He concluded that an instructor should have a good knowledge and understanding of the cognitive domain of learning, so that s/he can build more effective learning plans and utilize the students thinking process in order to encourage them to learn the information and apply that knowledge acquired.

1.4.2.2 Psychomotor domain
The psychomotor domain (also known as kinesthetic learning) is obtained from one’s ability to physically operate the object or move the body to perform or accomplish tasks. It is associated with the use of the
brain, senses and body to learn. Akin to
cognitive learning the domain involves a
process as follows:

1) Firstly, observing the skill or activity
being performed
2) Imitating by copying the skill,
movement or activity in a step by step
approach
3) Manipulating through some initial
number of trials and perfecting and
4) Naturalizing the very last stage where
the student performs the tasks
perfectly all the time

Bloom (1984) concluded that a good
understanding of this domain is necessary
because the instructor can demonstrate the
skill to the students first who will then be
expected to practice the skill until they reach
perfection.

1.4.2.3 Affective domain of learning

This approach focuses on the preferences,
perceptions, attitudes, feelings and values of
the student. This approach is very unique in
the sense that whilst the others (Cognitive
and psychomotor domains) focus on a group
of students, this affective domain focuses on
the individual student. In his works on
taxonomy of learning, Bloom (1984)
identified five levels of affective learning as
follows:

1) Receiving where the student receives
the information of the concept of say,
values
2) Responding where the students is
expected to respond or acknowledge
the concept and alter behavior
appropriately
3) Valuing where the individual is able
to show, through an evaluation, that
s/he has internalized the concept. In
other words, the concept has become
part and parcel of him
4) Organizing, by way of comparing and
contrasting the different values or
concept exhibited by the different
students.
5) Finally, a full adoption of the new
concept

Bloom concluded that because affective
learning takes place in the mind, it is
important that the instructor looks for subtle
changes in the students in order that affective
learning can be effectively monitored.

1.4.3 Language, SC and Learning
Research shows that language provides a great deal of raw material for the development of social cognition and theory of mind (Reeves, 2008). de Villiers et al (2000) cited by Brenda Schick, Jill de Villiers, Peter de Villiers & Bob Hoffmeister (2000) attempted to determine whether deaf Children were equally delayed in tasks that used language and those that didn’t. It also explored what aspects of the children’s development might be related to their understanding of the mind. The study included 176 children with a profound hearing loss representing three groups: 86 children being educated orally (53 with hearing aids, 33 with cochlear implants), 41 deaf children with hearing families learning American Sign Language (ASL), and 48 deaf children with deaf families exposed to ASL from birth. Unlike most previous studies, all children using ASL were tested by deaf adults who were native signers of ASL, and interpreters were not used. Not surprisingly, the deaf children with deaf parents performed much like hearing children, while the children with hearing parents were significantly delayed in their understanding of a Theory of Mind.

The results also show that the deaf children who were delayed in Theory of Mind were equally delayed in both the verbal tasks and the tasks that required minimal language. Research on the development of Theory of Mind skills with children who have limited access to language shows us the powerful role language has in developing fundamental social and cognitive skills (de Villiers et al, 2000). There is a connection between SC and Academic learning. Reeves (2008) cited reading as one of the skills in SC which are essential to learning. Astington and Pelletier (1996) suggests that there may be a relation between children’s level of Theory of Mind development and their ability to learn by instruction and collaboration. They suggest that Theory of Mind understanding is also linked to the development of scientific thinking and critical thinking.

For Deaf people the mode of communication is the sign language. The Ghanaian Sign language (GSL) therefore remains the main medium of communication among deaf and hard of hearing people in Ghana. It is the means by which they receive and give out information (Nortey, 2009). With the Sign Language, the reception of what is said, viewed, felt and thought of or spoken is through the use of the eye and gestures of hands and body. Sign language is a basic natural language for the deaf, especially for
those who were born deaf. It is the means besides reading, by which the world of the deaf can be explored by the hearing and that of the hearing by the deaf (Nortey, 2009). The issue of language clearly is one that is woven throughout our understanding of cognition, learning, and the development of deaf children. More implicit is the assumption underlying efforts to promote integrated education for deaf students that, once communication barriers in the classroom have been removed, teaching and learning processes for DHH and hearing students should be much the same (Marshark, M. & Hauser, P. 2008).

1.4.4 Ecological theory
The Ecological theory is credited to Urie Bronfenbrenner. Bronfenbrenner argues that in order to understand human development it is important to consider the whole ecological systems in which growth occurs. Most researchers see this theory as one that looks at a child’s development within the context of the system of relationships that form his or her environment. Bronfenbrenner’s theory defines complex “layers” of environment, each having an effect on a child’s development. Four types of environmental systems are specified. These are the micro, meso, exo and macro system levels.

Referring to Bronfenbrenner’s work, *The ecology of human development*, the Microsystems layer, the smallest of the contexts in which the child is embedded, is made up of the environment where the child lives and moves. The people and institutions the child interacts within that environment make up the Microsystems. Examples are immediate family members, childcare and school teachers and peers, and perhaps neighborhood play area, depending on the age of the child; school, and religious institutions or spiritual groups may be part of the system. The younger the child, the smaller the number of Microsystems. The Microsystems are set in the mesosystems layer.

The mesosystems layer relates to the interactions the people in the Microsystems have with each other – as parents interact with childcare providers, or as neighbors interact with each other, for example. The child is not directly involved with the mesosystems, but nevertheless is affected by them.

The exosystem layer is a wider context as it relates to the broader community in which the child lives. Examples of what is in the
The macro system – this layer may be considered the outermost layer in the child’s environment. While not being a specific framework, this layer is comprised of cultural values, customs, and laws (Berk, 2000). The effects of larger principles defined by the macro system have a cascading influence throughout the interactions of all other layers. For example, if it is the belief of the culture that parents should be solely responsible for raising their children, that Culture is less likely to provide resources to help parents. This, in turn, affects the structures in which the parent functions. The parents’ ability or inability to carry out that responsibility toward their child within the context of the child’s Microsystems is likewise affected. The chronosystem – this system encompasses the dimension of time as it relates to a child’s environments. Elements within this system can be either external, such as the timing of a parent’s death, or internal, such as the physiological changes that occur with the aging of a child. As children get older, they may react differently to environmental changes and may be able to determine more how that change will influence them.

1.5 DHH and the Disabilities Laws of Ghana

In Ghana, accent to human rights declaration led to the passage of the Persons with Disability Act 715 passed in August, 2006. In 2006 Parliament implemented the ‘Persons with Disability Act’, which aims to provide a legal framework for persons with disability in Ghana.

By passing the Act Ghana seeks to do the following:

i. Fulfill a constitutional obligation of enacting laws to protect and promote the rights of people with disabilities

ii. Fulfill Ghana’s international obligations

1.5.1 Contents of the Act

It is made up of 61 clauses which are grouped into the following sections:

i. Rights of persons with disability

ii. Employment of persons with disability

iii. Education of persons with disability
iv. Transportation  
v. Health-care facilities  
vi. Miscellaneous provisions  
vii. Establishment and functions of National Council on Persons with Disability  
viii. Administrative and Financial provisions  
We focused on the aspects of the act which affects education, as follows:  

1. **Education of a child with disability**  

16. (1) A parent, guardian or custodian of a child with disability of school going age shall enroll the child in a school.  

2. A parent, guardian or custodian who contravenes subsection (1) commits an offence and is liable on summary conviction to a fine not exceeding ten penalty units, or to a term of imprisonment not exceeding fourteen days.  

2. **Facilities and equipment in educational institutions**  

17. The Minister of Education shall by Legislative Instrument designate schools or institutions in each region which shall provide the necessary facilities and equipment that will enable persons with disability to fully benefit from the school or institution.  

3. **Free education and special schools**  

18. The Government shall  

1. Provide free education for a person with disability, and  

2. Establish special schools for persons with disability who by reason of their disability cannot be enrolled in formal schools.  

4. **Appropriate training for basic school graduates**  

19. Where a person with disability has completed basic education but is unable to pursue further formal education, the Ministry shall provide the person with appropriate training.  

5. **Refusal of admission on account of disability**  

20. (1) A person responsible for admission into a school or other institution of learning shall not refuse to give admission to a person with disability on account of the disability unless the person with disability has been assessed  

by the Ministry responsible for Education in collaboration with the Ministries responsible for Health and Social Welfare to be a person who clearly requires to be in a special school for children or persons with disability.  

A person who contravenes Subsection (1) commits an offence and is liable on summary
conviction to a fine not exceeding fifty penalty units or imprisonment for a term not exceeding three months or to both.

6. Special education in technical, vocational and teacher training institutions
21. The Minister of Education shall by Legislative Instrument designate in each region a public technical, vocational and teacher training institutions which shall include in their curricula special education, such as:
1. Sign language, and
2. Braille writing and reading

7. Library facilities
22. A public library shall as far as practicable be fitted with facilities that will enable persons with disability to use the library.

2 Methodology
2.1 Philosophical assumption
It is in order that researchers make known their philosophical assumptions in qualitative studies. This is so that readers would understand the rhetorical and methodological approach to the study. In addition to such assumptions as ontology and epistemology, Creswell (2009 p 61) upholds the view that researchers must bracket out (epoche) their own experiences when conducting a phenomenological study. Bracketing is the first step in the process of data analysis in phenomenological studies (Moustakas, 1994). Our philosophical assumptions are clearly that of qualitative research.

2.2 Participants
Participants were all the DHH registered as students on campus. They numbered ten in all (Male 3: Female 7).

2.3 Data collection procedures
2.3.1 Initial Informal interview
This was the first step in the data collection procedure. An informal meeting with all the participants on individual basis was held on campus. This meeting also involved their interpreters. The motive was to establish a bond of relationship with the participants. We also took the opportunity to educate them about the motive, purpose and aims of the research. The two central questions were explained to them. An informal interview was also held with their parents and wards through mobile phoning to obtain their consent. We gathered some very useful information about the participants from this interview; including the fact that they have good writing skills.
2.3.2 In-depth interview through the use of questionnaires

This was the main data source. Participants were asked to answer the two central research questions via the writing of a composition. We felt that this arrangement was the best especially after having had a good impression about their writing skills. They were given a month to complete the assignment.

2.4 Data analysis

We followed the steps (albeit adapted) suggested by Creswell (2009, p 89).

- We read through the written transcripts several times to obtain an overall feeling for them
- We identified significant phrases or sentences that pertained directly to the experience
- We formulated meanings and clustered them into themes common to all of the participant’s transcripts
- We categorized the themes under 4 headings
- We integrated the results into an in-depth, exhaustive description of the phenomenon
- We validated the findings with the participants and included the participants’ remarks in the final description.

2.5 Reporting structure

The presentation of the report included significant statements, the themes and their meanings. These are the philosophical ontological implications for practice as far as qualitative research is concerned (Creswell, 2009 pp 17).

3. Results

Based on the interview notes, we coded the responses under the following categories:

3.1 Learning style

The learning style is the way that the DHH prefers to learn. All the students mentioned the taking down of notes as their preferred style of learning. Whilst 8 mentioned a combination of notes taking and group work, 7 mentioned that they used the internet as a support. One significant statement was “I learn through a note taking; that is when we are in class. I write them down and revise and also search for more information about it in the internet”. For another, “the internet is a blessing because it serves as a supplement learning source especially when my attention in class is hindered by some human factors during class sessions”.

Available online: http://edupediapublications.org/journals/index.php/JSMaP/
None played any active role in group work, because, in the words of one student, “interpreters are not around during group studies to help us”.

3.2 Learning barriers
The learning barriers are those conditions that disable the learning process of the DHH students. One major impediment was in “ineligible writings (in vivo) on the board. “I make double losses whenever this particular lecturer is teaching: loss of hearing and lose of sight. His writings are horrible so much so that I have to depend on my other colleagues for notes”. 5 of the students described as disruptive the practice where some students tended to ask questions “too many times.” “Because I depend on my interpreter such practices tend to slow down my abilities to pick things fast” was a statement which appeared to represent that of the 5 students.

All the students complained about the lack of the sign language as a barrier to learning. “We have come from an environment where all teachers used the sign language. The situation here is unaccommodated, very, very. The changeover experiences were worse. I am just struggling to overcome this experience. Where are the facilities as we have them in the laws? The polytechnic is doing its best by providing an interpreter but what about the government agencies such as the ministry of education? Nobody seems to care”.

3.3 Social life impediments
The students described social life impediments as those factors which impede their active participation in social activities. All cited the lack of sporting programs for the disabled, whilst 7 mentioned that they felt being left out especially during public gatherings such as conferences, symposiums and staff-students meetings. “It seems they forget that we need interpreters as well during such meetings”. For 3 of them, their sporting talents are going waste in the absence of sporting activities for the disabled.

3.4 Relationship with other students and staff
For all of the students, relationships with the other students is cordial. They get a lot of support from other students by way of sharing of notes and during group assignments. “The way of thinking about me is positive. That is what I make out from my colleagues. Bertha (not real name) would always approach me and ask if I had any problem during the last class session”. “Whenever my interpreter does not come, my
colleagues always make an attempt to help me. Some know a little of the sign language and that is an asset to me”. “Some of the lecturers seem to bother about our plight whilst others are not bothered. I must say that I appreciate this research work that you are doing with us: it shows that you are concerned about the problems that DHH face and that is refreshing”. “Except for our non-inclusion and non-recognition of DHH on campus during certain activities like sports; the general social atmosphere here is cordial”.

4 Discussions of results and implications
4.1 Social cognition amongst DHH
It is worthy of note that The DHH in the Koforidua Polytechnic has a significant level of social cognition, in qualitative terms. Their abilities to evaluate the social context (Khan et al 2014) such as their learning preferences and the identification of the barriers in the environment, in which they study, are demonstrated in the study. Our understanding of the social context in which they had those experiences was aided by the ecological theory. The implications are that the DHH are capable of achieving academic excellence through the domains of learning. In fact, Reeves (2008) and Astington and Pelletier (1996) testified this in their works. They also established a clear link between Social Cognition to the development of scientific thinking and critical thinking (an aspect of cognitive domain of learning). We hypothesis therefore that:

\[ H: \text{The DHH will compete favorably with other non-DHH students when the right conditions for learning are made for the DHH} \]

4.2 Practical implications
We suggest some of the idyllic conditions under this heading as follows:

4.2.1 Meeting up Special needs of DHH
Some authors have suggested the acquisition of cochlear implants, speech reading computer programs, computer assisted note taking, to improve the hearing capacity of the DHH. We add that the employment of Professional and reliable interpreters for DHH must also be considered. Such Interpreters employed in working in educational settings, such as the polytechnic need to have specific knowledge of academic content as well as knowledge of child development.

Seal (1998) offers a description of the educational interpreter’s position. Among other responsibilities related to the actual process of interpretation, she recommends
that interpreters be able to “assist with other
duties as determined appropriate by the
educational team” (Seal, 1998: 23).

4.2.2 Special attention and monitoring of DHH
Special attention and monitoring of DHH students using the affective learning approach, in addition to the other domains of learning, such as cognitive learning and psychomotor learning is suggested. At this point we suggest that DHH students enroll on the more technical programs such as engineering and hospitality. It is our thinking that they will be more at home with the psychomotor learning domain. A Polytechnic-family of DHH partnership in managing assessment, and placement of DHH students is suggested here.

Our position is supported by Luckner, (2002) who posits that students are required to live a relatively supportive educational system, which usually includes trained special education professionals and specialized services, for the dynamic and unsheltered world of adult living, which typically does not provide the same level of services or support. To better meet the challenges of everyday adult living, professionals, and families along with adult service providers, state agency representatives, community members, and faculty at postsecondary institutions need to work together to develop, implement, monitor and evaluate transition plans that help individuals who are deaf or hard of hearing lead personally fulfilling lives.

Also there is the need for provision of transition services The transition from school to postsecondary education or the world of work, as well as managing adult responsibilities and living independently, represent a major challenge for many individuals who are deaf or hard of hearing (Danek & Busby, 1999). We associate ourselves with the views taken by these authors and add that the involvement of the students counseling department of the Polytechnic is called for here.

4.2.3 Recognition of DHH culture on campus
Like most communities, DHH culture is supposed to share patterns of beliefs, values, behaviors, social customs, and knowledge that represent characteristics of the community and define the culture. There are ways of bringing them together. It is suggested here that the IT department of the polytechnic creates a website especially for
DHH or a virtual forum for them where they can chat amongst each other.

Another way of bringing them together is by creating central points of programs specializations in the polytechnics for DHH students. For example, Koforidua might be made a specialist point for offering Programs in secretary-ship and management for all DHH students in Ghana. In that case the numbers will be sufficient to justify a special hostel accommodation for only the DHH. Creating a DHH culture through this is highly achievable.

4.2.4 Impact of the disability laws on polytechnic students

The students recognize that the Koforidua Polytechnic is doing its best in offering the best services to them. Some aspects of the laws are being implemented by the polytechnic. However, the provision of some of the additional services suggested here will ensure that the impact is well felt by the DHH.

Some aspects of the laws remain to be felt by the DHH. Most of these are expected from the ministry of education, such as the provision of full facilities (section 2 sub-section 17 of the act).

4.2.5 Teaching tips for teachers of DHH

The following teaching tips have been culled from a write-up by an Educational Counseling and Disabilities Services (ferris.edu) which ends our recommendations for practice, as follows:

- Keep instructions brief and uncomplicated as much as possible. When repeating instructions, repeat exactly without paraphrasing.

- Clearly define course requirements, the dates of exams, and when assignments are due. Provide advance notice of any changes.

- Present lecture information in a visual format (e.g., chalkboard, overheads, PowerPoint slides, handouts, etc.).

- Use more than one way to demonstrate or explain information.

- When teaching, state objectives, review previous lessons and summarize periodically.

- Make instructional on-line course materials available in text form. For that material which is graphical in nature, create text-based descriptions of material.
Repeat the comments and questions of other students, especially those from the back rows. Acknowledge who has made the comment so students who are deaf or hard of hearing can focus on the speaker.

When appropriate, ask for a hearing volunteer to team up with a student who is deaf or hard of hearing for in-class assignments.

If possible, provide transcripts of audio information.

Allow several moments extra for oral responses in class discussions.

In small group discussions, allow for participation by students with hearing impairments.

Face the class while speaking; if an interpreter is present; make sure the student can see both you and the interpreter.

If there is a break in the class, get the attention of the student who is deaf or hard of hearing before resuming class.

People who are deaf or hard of hearing often use vision as a primary means of receiving information. Captioned videos, overheads, diagrams, and other visual aids are useful instructional tools for students with hearing impairments.

Be flexible: allow a student who is deaf to work with audiovisual material independently and for a longer period of time.

Assist the student with finding an effective note taker from the class.

Provide hand-outs (preferably electronically) in advance of lectures and seminars.

Ensure key notices e.g. regarding cancellations or re-scheduled classes, are also announced in ways that are accessible to deaf or hearing impaired students.

In lecture/discussion classes, take care over seating arrangements and encourage people to take turns to speak. Work with the student on strategies to help them participate fully and find out if they wish any other adjustments.

Circular seating arrangements offer students who are deaf or hard of hearing
the best advantage for seeing all class participants.

- When desks are arranged in rows, keep front seats open for students who are deaf or hard of hearing and their interpreters.

- Make field trip arrangements early and ensure that accommodations will be in place on the given day (e.g., transportation, site accessibility). Provide plenty of warning so a personal assistant or adaptive equipment can be arranged as appropriate for laboratory work and field trips.

- A health and safety assessment for the student may be necessary in certain situations, and should be carried out beforehand. 'Reasonable adjustments' must be considered in the light of any perceived risk.

- Individual induction to laboratory or computer equipment may be helpful.

5 Conclusions
We were motivated by the need to produce this paper because of the increasing number of DHH in the polytechnic. Background information on the DHH suggested problems in their learning processes. Based on this we used an appropriate method of research, namely a phenomenology to explore their experiences in the process. The theoretical background information attested to some of the problems as well as helping us to understand them. The findings suggested that though they face problems in their learning process they have the potential to match the academic performance other non-DHH students, especially when given the right environment for learning. Thus we placed a hypothesis, based on this finding, at the tail end for future research.

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