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META-SYNTHESIS OF SAMPLING METHODS USING CODING STRATEGIES AND SOCIAL MEDIA FOR DEAF AND HARD OF HEARING NURSING STUDENTS

by

TIMBERLY ROBINSON

DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

DOCTOR OF EDUCATION

2016

MAJOR: EVALUATION AND RESEARCH

Approved By:

Advisor Date

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DEDICATION

*To my mother,
Your investment in time
with me at the library did not go to waste.
The library became my physical refuge.*

*A place where I saw myself,
a place of solitude.
Discipline allowed me to create
that same quietness and stillness
in other environments,
where it becomes easy to hear direction
for steps leading to the next journey*

Thank you Reobia—
Our paths will meet again
Your chariot came sooner than anticipated
About a year after I began this five-year excursion
If I remember correctly, which I do, indeed

I still have much work to do
And hopefully this assignment
Will be one of many
that will allow my Master to say,
Well done, good and faithful servant

Tim

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Thank you Donna Carol Maheady and Marcie Johnson for sharing your resources. Without the anonymous survey participants, the time of project completion would have been much longer. Social media provided an informal introduction with members of the Deaf and Hard of Hearing community. Thank you for sharing your story through video.

One of the highest honors a student can experience is to sit in the same circle of accomplished academic scholars who have a heart to give. To the members of the Dissertation Committee, I am forever grateful for your frankness about my initial proposal. Without your candor, this paper would have not emerged. *Dr. Sawilowsky*, you exude a high standard of excellence that is contagious. A quality that I hope to maximize as I transform into an individual with oversight of students. Thank you professor, for always going that extra mile. *Dr. Coulter*, thank you for your willingness to always share lessons learned and taking me under your wings as a very short notice. *Dr. Feleta Wilson*, thank you for sharing your story. During times of wanting to abandon the process and return to a comfortable, non-challenging regimen, I remembered your story. *Dr. Tonso*, your passion and rigor in teaching courses in ethnography ignited a torch in me that had been deeply rooted, but not surfaced. I immediately knew that I was on the right path to do research that I had long desired. Michael Quinn Patton, thank you for writing the excerpt about the first qualitative education study on Daniel. That passage inspired and confirmed part of my existence on earth. Terrence and Michael Robinson, never lose sight of your purpose. It will carry you through life's difficult moments. Trust in God, Be led by Holy Spirit and be not afraid to use the name that is higher than all things, Jesus.

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PREFACE

Purpose in life is not chosen, it is predestined. The path to seize destiny is not smooth. It is bumpy with thorns. Many become distracted. Burdens of life weigh others down. Injuries will cause some to forfeit the race. Others will overcome. They will bring forth fruit. Their stories must be told. They are the Extreme or Deviant sample.

CHAPTER 1: BACKGROUND

Background

Three hundred nine million people reside in the United States of America and ten million citizens were classified as Deaf and Hard of Hearing (D/HH). An estimated four million hearing individuals were employed in healthcare jobs (U. S. Census Bureau, 2010a) in comparison to approximately fifty-two thousand D/HH individuals. The majority of jobs held by D/HH were in non-professional roles such as nursing/psychiatric home-health aides which represented an estimated 23% of the D/HH healthcare workforce (Building Pathways to Health Care Careers, 2012). In an effort to learn more about the transition from higher education into professional healthcare roles, this qualitative study is aimed to understand the culture of the Deaf and Hard of Hearing community by using multiple coding strategies to compare and evaluate experiences between D/HH current or alumni nursing students and D/HH students in non-nursing fields to develop underlying patterns in data (semantic domains) as the framework for determining value received by D/HH nursing students from use of electronic, physical, and labor resources, in addition to, exploring means of communication and perceived patient safety risks.

In 2010, the birth of an aggressive strategy began to emerge aimed to increase the number of D/HH individuals in professional healthcare fields. A task force was formed with partners from Gallaudet University, Rochester Institute of Technology (RIT) National Technical Institute for Deaf, University of Rochester Medical Center, and Rochester General Health System. Other invited partners were from institutions which included the University of California and the University of Arkansas. Members were comprised of faculty and chairpersons from disciplines including audiology, communication (English, cultural and creative studies), education, innovation and technology, natural sciences (biology/chemistry/physics), health services (public

health, nursing); medicine (surgery/community outreach, family medicine, obstetrics/gynecology, genetics); American Sign Language and interpreter.

Committee members met nine times during an eighteen month period between fall 2010 and spring 2012. Three goals identified by the task force committee were to (1) gain insight upon review of occupational and educational trends from quantitative data; (2) gather qualitative data; then (3) use quantitative and qualitative data to compile objectives with a target date of 2022 to achieve. Methods used to gather information included three focus groups and 49 interviews between task force members and individuals of influence, referred as the gatekeepers, consisted of deans and a corporate vice president of organizational training to identify their concerns related to schooling and employment for D/HH students and employees.

Topics at the forefront included having adequate resources available to help institutions and employers correctly interpret necessary requirements to provide various types of accommodation support that will not have a negative budget impact. The dynamics of the workplace environment require interaction with colleagues and there is not a wealth of research available on this topic nor sufficient longitudinal data to monitor career growth for D/HH employees. Academic personnel particularly at the level of lecturer in higher education are equally baffled about the degree of accommodation requirements and mentioned insufficient advanced knowledge to plan for the classroom arrival of a D/HH student at City University. Noble (2010) who lectured in adult nursing and development communicated with colleagues through *CitySpace*, a “virtual discussion board” (p. 1) to discuss encounters with D/HH students.

Hospital Environment with Deaf Professionals

Safety must also be addressed since hospital equipment and emergency systems rely on alarms to alert staff by sound of imminent danger. The sentiment of desiring more information to better understand the types of accommodations needed to enhance communication between hearing and non-hearing practitioners in critical roles is a legitimate concern of perspective medical hospital personnel. Hospital officials bear the burden to ensure patients under the care of a practitioner needing special arrangements to perform tasks in life-threatening situations can deliver quality services with minimum negative effects.

Acute care and ambulatory environments are demanding and present unique challenges for D/HH professionals. Hauser, Finch, and Hauser (2008) described a complex relationship between an OB/GYN physician and a designated interpreter. A designated interpreter differs from a general interpreter because specialized skills and language is needed in the specialty area. Insight into daily working conditions needed to accommodate the D/HH medical professional were discovered from examination of a designated interpreter's role in the OB/GYN environment. Areas of interest included positioning of the interpreter during physician and patient encounters for pelvic and breast exams in addition to the delivery room.

In a hospital setting the designated interpreter must communicate patient information discussed between members of the medical team to ensure the patient's quality of care is not at risk. Deaf physicians rely on the designated interpreter to understand acronyms used in "sign-off" (Hauser et al, 2008, p.152) language between shifts with the leaving medical team and the onboarding personnel. Terminology is specialized and the designated interpreter adapts to culture to know which terms to sign with letters like TVH in substitute for creation of a new sign to interpret *Total Vaginal Hysterectomy*. Another acronym to sign with letters is S-R-O-M instead

of signing for the term *Spontaneous Rupture of Membranes* or signing letter: HCT as opposed to hematocrit used in laboratory discussions. Abbreviations used in one discipline are not synonymous in other departments like AMA means advanced maternal age in obstetrics but in internal medicine it means *Against Medical Advice*.

The range of responsibilities for the designated interpreter span beyond interpretation of communication between practitioners and patients. A designated interpreter may serve as a planner assigned to obtain speaker notes prior to the D/HH physician attending a lecture that could last beyond sixty minutes. If available the designated interpreter should arrange to receive a copy of the lecture content to become familiar with the information prior to signing during the lecture. To reduce tiredness, the recommendations are to use several interpreters to rotate signing lectured materials every “fifteen to twenty minutes” (Hauser et al, 2008, p.157). The gender of the interpreter matters for answering phones on behalf of the deaf professional. Manufacturers do produce specialized equipment to accommodate unique communication telephone needs like dual headsets that permit an interpreter to listen in addition to D/HH person.

Designated interpreters are not exempt from compliance issues specifically related to surgery. Attendance of universal precaution training (i.e., drying hands and remaining sterile) upholds occupational safety laws and increases patient safety. The deaf professional relies on his or her designated interpreter during surgery. As noted with the classroom environment several key personnel are in the surgery room. The interpreter must be strategically stationed because others also are positioned nearby like the scrub technician to hand physicians instruments.

Interpreting any communication by the anesthesiologist and others related to medication, vital signs, fluid volume, or blood loss benefits the deaf physician. To speak during surgery surgeons used a hood mask with fans, battery-operated which generates noise. The surgery

environment is difficult for a designated interpreter to hear all conversations discussed between surgical team members. For this scenario, the head/attending physician has a microphone within the mask and a receiver is within the mask of the interpreter; yet communication between other team members was still heard. The designated interpreter may be requested to perform surgical tasks such as passing or holding surgical instruments. Issues related to liability may surface if the interpreter is not a hospital employee. Hospitals may not be under legal obligations to pay for incidents caused by an interpreter if he or she is a contractor.

There are many dimensions to onboarding a deaf professional as a team member of the workforce in a medical setting. Either human resources or a clinical administrator may need to conduct a detailed workflow analysis to understand the types of accommodations needed. Also in regards to whether there were any negative effects on patient service, it might be worthwhile for ambulatory and acute settings to address this issue within the patient experience survey.

Short-term recommendations potentially of value to employers and D/HH individuals include expanding accessibility into professional healthcare fields by furnishing information to potential employers about effective methods to decrease communication barriers and obtain more trained individuals fluent in highly technical subject areas to interpret. Continuous exposure to the community about healthcare professional opportunities is essential in addition to conducting more research in an effort to develop curriculums in education and on-the-job.

The Law: A Need for Interpretation

A legal representative from the Office of Civil Rights division also participated in the Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community meetings which was appropriate given the discourse surrounding language in the American Disability and Rehabilitation Acts. Even in the United Kingdom inconsistency lies within interpretation of

language in the Equality Act 2010 which aimed to address several anti-discrimination acts related to equal pay, fairness pertaining to employment involving public and private services where people are not excluded based on race, sex, or disability.

Even with the best intent, altered types of support services are delivered to D/HH students in higher education. This is not necessarily a negative outcome given that each student has distinctive needs. Another factor to consider hinders upon the degree of services offered to a D/HH student at previous schools could impact current needs in higher education (Saunders, 2012).

Insight into some of the challenges encountered by deaf and hard of hearing students were expressed by two D/HH faculty at Gallaudet. From personal accounts, challenges to secure jobs within specialized field of training were caused by inability to secure internship noted by temporary pharmacology instructor still in pursuit of a pharmacy license after years of challenging and threatening the board of pharmacy with a lawsuit for refusing to grant certification due to inability to pass oral English language requirements. A similar experience was noted by a psychology Assistant Professor who was unable to secure practical internship hours. Reaching the pinnacle of securing employment in a healthcare field is a major accomplishment even though obstacles continue to arise related to post-licensure educational requirements. One physician indicated that achieving a minimum of 50 hours annually of continuing medical education coursework presented a challenge after paying for travel to attend a conference only to discover upon arrival that certain sections were closed.

Specific tools used to enable D/HH students to better grasp information communicated within classrooms include: American Sign Language (ASL), transcription services, hearing assistant technology, note taking services, speech-to-text services, interpreters, cochlear implants

and remote live captioning. One system called FM has been described as inexpensive in comparison to other devices and it works by attaching a small transmitter and microphone to the teacher then radio waves flow to the cochlear implant or hearing aid of the student. Other sound is blocked and the limitation is preventing sound generated by anything or anyone else in the classroom (Stover and Pendegraft, 2005).

Additional services like transcription and captioning incur hourly rates and expenses can be costly when considering total expenses per student. To accommodate these types of needs for D/HH postsecondary students require funds and debates continue about whether universities and employers are responsible for these type of expenditures. The position statement by the National Association of the Deaf (NAD) declare that higher educational institutions and vocational rehabilitation services must furnish support services whether in the form of technology and/or labor resources such as note takers to help D/HH students (NAD Government Affairs and Law Center, 2002).

Court cases occurred between students and universities to attest this issue. One case in particular settled on September 4, 2013 related to the obligation of a medical school to furnish a D/HH student with interpreting and captioning services. The verdict in favor of the medical student represented by the law firm of The National Association of the Deaf required Creighton University to provide adequate services to the student. The verdict indicated a violation of "...communication access under the Rehabilitation Act and the ADA" had occurred (Foster, 2013).

Each case is relevant since approximately 1.2% of four million healthcare employees in the United States are deaf and the percentage is smaller for D/HH persons employed in professional healthcare classifications (see Chart 1, Appendix). Interpretation of the law is

complex which is one of the reasons why a commentary was printed on Pepperdine University's website in an attempt to define reasonable accommodations based on reprinted materials from Higher Education and the ADA: Issues and Perspectives, (DAIS, 1997):

In the context of higher education, it is easier to define what is not reasonable and assume that if the accommodation needed does not clearly fall under those guidelines, it is probably reasonable! There are three kinds of accommodations that are not considered reasonable: (1) It is not a reasonable accommodation if making the accommodation or allowing participation poses a direct threat to the health or safety of others; (2) It is not a reasonable accommodation if making the accommodation means making a substantial change in an essential element of the curriculum (educational viewpoint) or a substantial alteration in the manner in which you provide your services; and (3) It is not a reasonable accommodation if it poses an undue financial or administrative burden. (Jarrow, J., n.d.)

Above mentioned lawsuit cases and the article cited by Jarrow were used as examples to reiterate that concerns of higher education admission officials are fair related to clarification of unclear policies.

The National Association of the Deaf acknowledged the effort needed for engagement between various entities (i.e., state, federal government and agencies) to ensure accommodations for D/HH students are fulfilled. Financial funding may be available towards accommodations at higher institutions pending D/HH students qualify and all criterion are met. Documentation of the disability must be filed with appropriate agencies which is another reason accommodations for students may not be timely.

The National Association of the Deaf also acknowledged lack of clarity concerning procedures in which support services are paid. Another reason why agencies, universities, and the government need to coordinate appropriate arrangements for D/HH students. Congress did amend the Rehabilitation Act in 1998 to provide guidance for entities mentioned above to utilize Interagency Agreements in an attempt to outline responsibilities of sole or shared delegated costs

for the purpose of preparing documentation ahead of time to avoid roadblocks and loss time for the benefit eligible D/HH student (NAD Government Affairs and Law Center, 2002).

The United States Department of Education, National Center for Educational Statistics (NCES) surveyed a sample of 1552 eligible institutions from 4265 postsecondary institutions in November 2009 and 1417 responded. Published results revealed that thirty-seven percent of institutions “indicated the extent to which the person or office responsible for providing support services to students with disabilities worked, either formally or informally, with the state vocational rehabilitation agency regarding students with disabilities, by institutional characteristics: 2009” (U. S. Department of Education, 2011, minor caution indicated with interpreting results).

A degree of caution was noted by data compilers of the U.S. Education Department (2011) report; yet of the 1417 institutions sampled, twenty-seven percent responded didn’t know if main website “*follow established accessibility guidelines or recommendations for users with disabilities*” (p. 15). Eighty-nine percent of respondents implement required accommodation features during building updates or new construction. Sixty-four percent of respondents allow faculty and students to participate during project planning to discuss accessibility features.

More than half (53%) of respondents have procurement policies that promote the purchase of assessable products (i.e., technology). Forty-six percent responded to providing “regular training opportunities to faculty about ways to make instruction more accessible to all students” (p.16). This indicates that 2-year and 4-year institutions are attempting to use collaborative approaches to address needs of students with disabilities in general. Reasons that “hinder the implementation of Universal Design features at their institution to a moderate or major extent” (p. 17) include resistance of faculty to change teaching style, cost of technology,

lack of resources to train faculty and staff in addition to cost of renovation to incorporate universal designs.

Labor Market

Nursing leads the professional career path for employing the largest percentage of Deaf and Hard of Hearing individuals as Registered Nurses (RN), Licensed Practical Nurses (LPN) and Licensed Professional Nurses. Twenty-three percent of total D/HH employees (52,857) within healthcare labor market are nurses which represents an estimated 12,157 persons. The median salary for a Licensed Practical Nurse and Licensed Vocational Nurses is \$41,540 per year and the median salary for a Registered Nurse is \$65,470 (United States Department of Labor, 2012).

By year 2022, the American Association of Colleges of Nursing (Rosseter, 2014) predict a shortage of one million registered nurses (RN) based on projections by the Bureau of Labor statistics. Fifty percent of the shortage of RNs is attributed to the increased influx of patients as a result of 2010 healthcare reform and a generation of Baby Boomers retiring. More than fifty percent of registered nurses currently employed are fifty years of age or older. Nursing schools across the United States may not be able to meet demands due to inadequate amount of faculty, clinical preceptors and student placement sites.

These challenges have resulted in thousands of nursing applicants not accepted into programs (Rosseter, 2014). Qualified D/HH nursing applicants still have to compete with other nursing students in the pool related to high grade point averages in science courses and be able to convince faculty members during an in-person interview that he or she is the best candidate which reiterates the importance of having the community educated about the needs and also abilities of the D/HH.

Top areas in healthcare (Building Pathways to Health Care Careers, 2012) with the highest percentage of employed D/HH individuals (N=52,857) in comparison to four million hearing employees designated by parenthesis () include: nursing/psychiatric/home health aides 23% (16.4%); registered nurses 16% (20.4%); counselors 7.5% (5.1%); social workers 6.9% (6.2%); licenses practical nurses/licensed vocational nurses 5.3% (5.0%); physicians and surgeons 4.0% (6.2%); clinical laboratory technologists and technicians 2.0% (2.5%); pharmacists 1.4% (1.8%); dentists 1% (1.2% hearing); massage therapists 1.2% (1.1%); emergency medical technicians and paramedics 2.0% (1.2%).

To gain more knowledge about educating students in higher education classified as Deaf and Hard of Hearing required reviewing data from Gallaudet University located in Washington, D.C. The university was founded in 1864 to develop programs for individuals with hearing loss even though approximately five percent of hearing students are accepted into an entering class. The Act of Congress, and “its charter was signed by President Abraham Lincoln” (Gallaudet, 2014). Gallaudet University regularly collects survey information on children and youth in the United States. Based on 2011 survey data collected on thirty-seven thousand nine students ranging in age from six to eighteen years and older, additional insight was gained pertaining to areas related to various levels of hearing loss, genetic factors, types of school settings, and demographic information pertaining to ethnicity, age, and language spoken.

The primary method of communication used to teach students was *spoken language* (53%) followed by *sign language only* (27.4%), *sign supported spoken language* (12.1%) also called SIMCOM and spoken language with cues (5.0%) based on results listed for 37,351 students submitted by institutions to compile national statistics (Gallaudet, 2011). Less responses (N=36,480) were reported for another question about frequency of sign usage in the home.

English was listed as the primary language used in the home (82%) out of 36,920 respondents then Spanish (21.9%) followed by American Sign Language (5.8%). Seventy-one percent of students' parents did not regularly sign in the home. Interestingly the same report indicated that approximately 77% of D/HH students (N=37,065) have hearing parents (p, 5).

The U.S Census Bureau (2010) estimated total population size within nation was 308,745,538 with a minimum of ten million (N=10,825,695) D/HH persons. Eighty-four percent of the D/HH population was identified as *white alone including Latinos* in comparison to 73.8% of hearing individuals. Black or African American alone was 7.9% and 12.8% hearing persons; Asian alone 2.4% D/HH and 4.8% hearing persons; American Indian alone 0.8% D/HH and 0.6% hearing persons; Native Hawaiian and Other Pacific Islander alone 0.1% D/HH and 0.2% hearing. Fifty-eight percent of the D/HH population is 65 or older (6,316,740) in comparison to 13% (40,449,374) of the hearing community.

Fifty-eight percent of the D/HH population is 65 or older (6,316,740) in comparison to 13% (40,449,374) of the hearing community. The second highest age group (45-64) represented twenty-six percent (2,922,278) of D/HH population which is the same percentage for the hearing population (81,667,688) in this age group. The third highest group from age range 26-44 represented 8% (883,232) of D/HH individuals and 25% (77,898,920) of hearing individuals. College bound individuals (19-25) represented only 2% (240,201) of the hearing impaired community and 9% (30,489,768) of the hearing population. Within the age range of six to eighteen there were 336,926 D/HH individuals equivalent to 0.6% of the U.S. population for the age group. The final D/HH group comprised of newborns, infants, and toddlers represented (126,318) 0.5% of the population for the age group 0-5 (Building Pathways to Health Care Careers, 2012).

Continued higher learning enrollment in the healthcare arena is the foundation of this study, yet it is relevant to examine the progress of D/HH students in postsecondary institutions. Schley, Walker, Weathers, Hemmeter, Hennessey and Burkhauser, (2010) reported that one of the primary factors that contributed to an increase of D/HH students enrolled in post-secondary institutions was credited to financial reasons. In the late nineties, statistics from U.S. Department of Education indicated more than twenty thousand D/HH students were enrolled in higher learning institutions and nearly a decade later the number has risen to approximately thirty thousand students (Schley et al, 2010, p. 525). In the 2011-12 academic fall year, there were 1994 enrolled students at Gallaudet University and more than 19,000 reported alumni (Gallaudet, 2014).

Economic Incentive

Investment in postsecondary education for students with hearing impairments “increase the likelihood of employment for persons who are deaf or hard of hearing and thus reduce dependency on disability-related income support programs,” (Schley, 2010, p. 527) based on longitudinal data obtained from the National Institute of Technical for the Deaf and Social Security administrative records. One finding revealed that students who began postsecondary programs and did not graduate for whatever reasons were equivalent economically to D/HH students who never began college.

Information attained from D/HH alumni self-reported surveys evaluated whether the degree had a positive impact relative to financial gains, similar to inquiry for the hearing population. Schley et al (2010) summarized outcomes from other scholars’ findings (Weathers et al, 2007) that indicated less dependence on Supplemental Security Income (SSI) programs for

D/HH students who earned degrees. Another finding from Walter, Clarco, and Thompson noted D/HH students earned more than 60% than students who did not complete their degree.

Hearing loss is measured in decibels (dB) according to the American National Standard Institute (ANSI). There are several categories of hearing loss. Profound hearing loss is measured as 91 dB or higher. Severe hearing loss is 71 - 90 dB. Moderate Severe is 56 – 70 dB. Mild to moderate is 27-55 dB and normal is below 27 dB. The value of this data is relevant in understanding possible rationale for physicians and trainees to use the following terms for self-identification: *Deaf, deaf, hearing-impaired, hard-of-hearing, and having a hearing loss* (Moreland, Latimore, Sen, Arato, Zazove, 2013).

More than forty-percent of students were classified with an “onset of hearing loss” at birth (Gallaudet, 2011) Etiology was not known for majority (57.8%) of students; however twenty-four percent indicated *genetic/hereditary/familial trait* followed by *post-birth disease/injury* (10.5%) and *pregnancy related* (8.8%). Both mother and father were classified as hearing parents according to seventy-seven percent of students and 3.5% of parents were deaf or hard of hearing. Overall, seventy-seven percent of students were not English Language Learners (ELL) and only thirty-eight percent were considered economically disadvantage under the No Child Left Behind Act (Gallaudet Research Institute, 2011).

Purpose of the Study

Constructing a model of the transitional journey from nursing student to healthcare professional has begun with pockets of data. Each D/HH account provides insight into understanding methods used to overcome specific obstacles that may have been stumbling blocks for other students who did not continue. Nursing clinical training centers on care of patients and team dynamics. Yet, there lies a major gap in documented in-depth accounts about clinical

training for D/HH nursing students. By obtaining more individual experiences in a phenomenological study, more insight is given pertaining to communication, performing clinical rotations and any other themes extracted from the data.

Definitions

The terms deaf and hard of hearing are used interchangeable to describe type of hearing loss and people within the culture. Capitalization of words differentiate people as opposed to the degree of hearing. Classifications are best defined from self-identification. Husserl, founder of the School of Phenomenology, esteems value in obtaining knowledge from experience.

Limitations

One characteristic of importance to a qualitative researcher is to establish trust with participants. There will not be any pre-established relationships with potential participants. A translator has not been hired for this project, therefore all communication between researcher and any participant will occur via internet.

Assumptions

Providing additional insight regarding a subject matter is different from declaring that findings apply to all D/HH students studying nursing or working as a professional. The survey tool will be written in English, although this language is not necessarily the primary language for D/HH.

CHAPTER 2: LITERATURE REVIEW

Cost to Simulate: Nursing Clinical Experience

Results from the U.S. Department of Education (2011) revealed cost was a major barrier hindering postsecondary institutions from implementing “universal design features into major renovation and new construction projects plans” (p. 17) to accommodate individuals with disabilities. A partnership occurred between a local hospital and postsecondary institution to create an environment focused on allowing potential clinical nursing professionals to enhance skills as a result of investing financial resources into technology. The College of DuPage spent \$350,000 to build a simulation lab (Gier, 2012) consisting of adult and child patient simulated mannequins. The cost per adult mannequin was \$45,000 and \$25,000 for infant-size.

Human Patient Simulation (HPS) has twofold benefits for faculty and students by offering another method to teach clinical methods and for students to gain clinical experience (Adamson & Kardong-Edgren, 2012). Within healthcare there are many specialty areas in the field of nursing and specific skills must be mastered which is why one simulation model initially failed in an attempt to create an environment with mix wards for three areas. In a typical ward setting, a nurse would communicate with a team of unit personnel (i.e., care assistant, porter, receptionist, anesthetist, and house officer). The academic team later determined that “simulation exercise should be pathway specific,” (McGrath & Hourican, 2011, p.e267). For instance, an acute-care student nurse needed a simulated environment to “assess, monitor and measure the physiological condition of acutely ill patients” (Nickless, 2011, p. 202).

The ultimate purpose is for students to become exposed to a variety of clinical experiences (Neill & Wotton, 2011). Creating various types of patient encounters is controlled by a technician that viewed and recorded student procedures while providing voice to simulated

patients. The recorded simulation experience in a pediatric environment allowed students to have a portfolio of their work. Instructors used an observation see-through room to monitor students. Debriefing occurs between instructors and students to recognize serious types of errors and unnoticed care in addition to providing students with an opportunity to identify areas to improve and feel comfortable to seek assistance.

If microphones do not detect all communication occurring within simulation nursing environment then assessment is difficult. With certain tasks, the use of technology is not the best training tool for *handover* often performed at the bedside to review individual cases providing an opportunity to engage patient-centered care. Nickless (2011) noted that debate in the literature cautions about generalizing simulation skills with the clinical environment; there is no substitute for clinical placement sites.

A combination of learning and teaching methods is accepted. Continued exploration of the learning experience of student nurses in the form of surveys and focus groups have provided results that overall support advanced simulation technology systems. Adamson (2012) noted that institutions have used caution in implementing capital projects with minimum empirical data on “evaluation instruments that allow nurse educators to make valid and reliable evaluations of student performance in HPS activities....most instruments had no reported reliability and validity evidence” (p. 1). Adamson used 29 raters to review video-archived simulation of nursing students’ proficiency at various levels.

Although simulation laboratories may not be the best predictor for success in a professional clinical environment, recorded videos could aid in identifying strengths and problematic areas that might be microscopic until communication interaction is captured between D/HH student and peers or actors representing healthcare personnel. One area of interest

would be to observe effect of time delays, if any. Myths often arise about the capabilities of D/HH individuals.

Nurse, Instructor, and Deaf

Even in perfect circumstances, a retired deaf nurse noted that only 40% of words spoken by colleagues were understood. Dimmed lights presented challenges in addition to beards and mustaches of physicians who adapted verbal communication with written notes after becoming informed of the nurse's disability and appeared "happy to write what they are saying" (Herth, 1974, p. 1060). The learning spirit of medical professionals even sparked a few physicians to inquire about learning words in sign language.

In group meetings, positioning a person to have "Face-to-face contact is frequently impossible and the speaker in the group changes rapidly" (p. 1061). Solutions required a team approach with colleagues and students. A creative technique was designed to distinguish speakers in group settings. The way it worked was that one person seated next to the deaf nurse wrote initials of each speaker then point to initials of speaker whenever the voice switched. Another person wrote down main points of the meeting and submitted to the deaf nurse.

Within the classroom environment, leaders began to emerge. Students took initiation to modify the norm. During small groups, seats were positioned to permit face-to-face contact which exhibited awareness about the disability and to a degree, compassion to accommodate a teacher's disability.

Interpreting facial expressions was beneficial to the D/HH nurse who became attentive to muscles that expressed whether an individual was relaxed or tense. The deaf nurse observed the frequency of lip movement and expressions of the eye. With this heightened ability Herth (1974) was able to detect after questioning patients whether responses aligned with body gestures. There

was one case in which a newly admitted diabetic patient acknowledged comprehension and agreement of taking insulin shots to hearing personnel prior to hospital discharge. She later revealed to the deaf nurse that taking medication may conflict with parents' religious beliefs.

Herth (1974) realized a transformation occurred during her professional nursing career. In the beginning, there was a period of denying loss of hearing to colleagues and staff. Eventually the time came to admit the need for assistance as self-esteem increased. However, patients were only informed of deafness on need to know basis which was dependent upon if issues arose as a result of limitations with communication.

Another self-observation made by the D/HH professional was that as one sense decreased other perceptions were enhanced in the workplace such as increased awareness of vibration and light. The image of a shadow while working in an office with a closed door replaced a knock. If an individual did not pass by the deaf nurse while walking in the hall then this was a signal that communication was needed. The deaf nurse admitted physical exertion due to heavy reliance on constantly having to be aware of the environment. To return to an internal stable equilibrium during the workday included independently going out to lunch and increase rest during leisure hours.

Learning about professional career experiences from one deaf nurse provided methods to address and resolve technical challenges related to answering telephones, taking blood pressure and listening to a heartbeat in addition to emotions often hid from the public. "I find that when my anxiety increases, my ability to perceive a message correctly decreases. Then written words and sign language become important vehicles for communication" (Herth, 1974, p. 1061). Earlier in Herth's career a hearing aid and telephone amplifier were used to answer telephones while employed as a staff nurse, there was still a degree of difficulty to interpret words. This

combination of accommodations was short-term and eventually became impossible to continue. A palpation was used to take blood pressure, but use of the stethoscope presented problems.

Holden (1979a) wrote a briefing about a nurse with severe hearing loss who had been a LPN for nine years prior to attempting to enter into a registered nurse program at Southeastern Community College where information elicited by the North Carolina Board of Nursing resulted in the institution denying the applicant admission due to the proposed risk of safety in a healthcare environment as a result of the hearing disability. The case of Frances Davis was defended by the National Association for the Deaf before the Supreme Court on the basis of decisions made prior to an assessment of the applicant's ability did not take into account prior work experience in the nursing field. The Supreme Court's decision ruled in favor of the college on the basis that interpretation of the Rehabilitation Act section 504 should not be interpreted to mean that colleges had to make major modifications in programs to accommodate students with disabilities (Holden, 1979b).

Types of Technology Advancing Educational and Professional Progress

Some of the devices that have improved learning and the work environment for D/HH persons include the beehive lamp, a device that attaches to a phone and displays flashing neon lights. The device is powered by regular phone rings. National data was collected on D/HH medical professionals. There was a total of 86 physicians representing a 65% response rate (Moreland et al, 2013). Feedback from academic professionals during focus groups enabled researchers to design survey questions. The content of multiple-choice and open-ended (i.e., age/location) questions centered on “demographics, accommodation and career satisfaction, sense of institutional support, likelihood of recommending medicine as a career and current/anticipated DHoH patient population size” (Moreland et al, 2013, p. 225).

Survey findings from D/HH physicians provided information that entailed the number of weekly hours devoted to scheduling for accommodations which ranged from 2 to 10 hours. Eighty-nine percent of respondents (N=50) used a modified stethoscope ranked highest for types of accommodations. Other accommodations noted were “auditory equipment, note-taking, computer assisted real-time captioning, signed interpretation, and oral interpretation” (Moreland et al, 2013, p. 224). Without having a national database of D/HH physicians, limitations existed relative to estimated sample size in comparison to the population.

The benefits of studying D/HH healthcare professionals provide insight into accommodations most frequently used to enhance communications like text-based pagers, smartphones, and videophones. In a commentary, McKee, Smith, Barnet, and Pearson (2013) summarized other gains from the national survey on D/HH physicians and trainees which identified appropriate resources for education environments:

- Interpreters with specialized healthcare training or experience
 - Real-time computer-aided transcription services or note-takers
 - Assistive listening systems
 - Formation of accessible study groups
 - Captioning on videos and films
 - Training of faculty on appropriate use of accommodations (e.g., FM system use)
 - Provision of telecommunication equipment (e.g., videophone)
- (p.159)

Medicine is a diverse field with many specialty areas requiring unique training. Studies on D/HH physicians have been scarce similar to water in a desert therefore any survey findings provide a benchmark for further investigation on physicians. A gap still exists in collection of information related to healthcare training in other professional disciplines, particularly, the learning experience of D/HH nurses which is the focus of this study.

Use of Qualitative Methods: Mental Health, Academics and Healthcare

Saldana (2013) mentioned in the preference section of the coding manual that during the past four years scholars and practitioners from fields representing: K-12, higher education, human development, social sciences, business, technology, government, social services, healthcare, and the arts used recommended coding practices based on information obtained in the first edition of *The Coding Manual for Qualitative Researchers*. This information influenced my decision to begin the journey by searching for literature on qualitative research that represented various types of industries to review methodology and methods used in the research design. The rationale for use of qualitative research in mental health expressed by remarks below:

Aside from an understandable need to support the “Full Employment for Anthropologists Act of 2008,” there is a very good reason to embrace the call to expand use of qualitative research methods in mental health services: we can’t understand what’s actually going on without them. This isn’t special pleading—it is mundane fact. If we want to understand how it works (whatever “it” may messily turn out to be), what it means, and the enabling contingencies that seem to sustain it, we need to deploy such methods (Hopper, 2008, p.711).

Physicians are ultimately responsible for the care of patients and one assistant professor employed as a Pulmonary and Critical Care Staff Physician studied communication between caregivers and patients in twenty-six bed cardiac-medical and general intensive care units at the Veterans Affairs hospital in Portland, Oregon. Methods used in the ethnographic study included three hundred fifteen observations and fifty-three semistructured interviews from 33 nurse participants (Slatore, Hansen, Ganzini, Osborne, Chestnutt, Mularski, 2012). “Communication interactions were categorized into 5 domains of patient-centered care. Interviews were analyzed to identify major themes in nurses’ roles and preferences for communicating with patients and patients’ families within the domains” (p. 135).

Goussinsky, Reshe, Yanay-Ventura, & Yassour-Borochowitz (2011) explained department heads at Emek Yezreel College in Israel implemented a three-phase model of

qualitative research methodology within the Human Services curriculum because “Qualitative research is an inherent part of the human services profession, since it emphasizes the great and multifaceted complexity characterizing human experience and the sociocultural context in which humans act” (p. 126). Findings from preliminary literature review provided a foundation for using a qualitative research approach to investigate a subject matter of interest to congressional representatives; relevant in the higher education teaching community and potentially beneficial to healthcare employers. To further expound on article preference selection is directly influenced by past employment as a public health officer in the field of health and human services, administrator in the College of Nursing and healthcare consultant. Roles for the past four years have relied on selecting methods to answer questions which impacted student and patient outcomes.

Articles selected exemplify fields in medicine, human services, and academics. It was important to have evidence-based approaches in disciplines that a consultant could use to solve day-to-day industry problems. The reference of a consultant was based on former work performed in a healthcare environment comprised of approximately eighty hospitals in the United States and daily interaction with executive leadership in medicine, nursing, operations, and information technology. The primary focus of the initial literature review was to (1) identify types of problems researchers wanted to explore further and conclusions; (2) determine if epistemology, methodology, and theoretical perspective were listed; and (3) examine qualitative methods.

Unite or Separate: Discussion of Mix Methods

Several articles seem to infer qualitative research has effective methods to evaluate issues facing leaders in the 21st century, particularly if used with quantitative methods as described by a

trained clinical psychologist who had not been a proponent of qualitative methods for reasons that surfaced from prior experience while serving on funding committees that rejected qualitative proposals because of inadequate sample size in comparison to quantitative research. The argument of quantitative research methods being superior to qualitative methods is a popular theme in the literature.

Saludadez & Garcia (2001) identified three subthemes during a focus group with university quantitative researchers who were opponents of qualitative approaches because qualitative methods cannot be called a science until prediction occurs and the ability to “approximate the precision and objectivity of the quantitative method” (p. 5). The idea that qualitative methods are really only of value if quantitative methods do not furnish sufficient data is one of the main reasons a clinical psychologist, statistical associate editor for a Canadian psychiatry journal, trained in positivism around the decade of 1960s and 1970s decided to serve as a guest editor for a qualitative research review.

The clinical psychologist admitted that previous perceptions of methodology involving research was framed upon association with quantitative analytics (Streiner, 2008) and the unwritten rule was that “if it cannot be measured, it does not exist” (p. 135). A change of heart occurred after involvement in research on environment hazards that consisted of multidisciplinary studies in which qualitative analysis added to the phenomenon experience.

Understanding the viewpoint of members in the qualitative community is also of interest. Finch (2004) mentioned that other methods are acceptable including quantitative and used surveys to investigate studies on *Family Obligations* and Inheritance of property. This decision generated a degree of controversy because an investigator known to the research community as a qualitative researcher chose to modify the methodological approach after determining the best

way to conduct feminist research was to use mix methods. In a mixed-study Koskey and Stewart (2014) examined meaningfulness of absolute magnitude estimation scales (MES) in survey research. Based on results from a nine month ethnographic study that examined retention rate of graduate engineering students, a survey was developed for the mix method study. “There are 42 Likert-style questions that use a scale from 1 to 5 where 1 is strongly disagree and 5 is strongly agree” (Crede and Borrego, 2013, p. 72).

Grounded Theory, Phenomenology and Discourse Analysis

Several methodologies were examined for the interpretive project centered on Deaf and Hard-of-Hearing participants beginning with grounded theory historically linked to sociology. The purpose of grounded theory is to develop an instructive theory of basic social procedures to understand complexities of the social process within specific environments. Outcomes of grounded theory research models provide a foundation for stakeholders to develop interventions (Starks & Trinidad, 2007). Observation and semi-interviews are used similar to ethnography and phenomenology for the purpose of acquiring knowledge to understand the participant’s experience followed by coding then crafting a theory. Elements of grounded theory consist of open and selective coding, theoretical categories, memoing, and diagrams (Wee and Paterson, 2009) which can be a lengthy process depending on sizable amounts of rich data.

Bell (2014) identified several themes for black males not graduating and indicated that grounded theory “allows the emergence of inductive codes through the collection and analysis of the data” (p. 4). Two coding methods were applied in data analysis: “open coding procedures identified common themes by naming, categorizing, and describing phenomena” (p. 4). Axial coding was the next method described as “the process of relating codes (categories and properties) to each other via a combination of inductive and deductive thinking” (p. 4) as defined

by scholars including Creswell, Miller, Strauss, Glaser and Corbin. Saldana (2013) provided an overview of second coding methods and the term *axial* is listed. The term *open* coding appears to have a similar meaning as *focused* (see *Figure 1, p. 27*) which leads to the belief that terms may vary but processes are similar. Participant recruitment is a determining factor whether grounded theory will be used for the D/HH research design. Starks and Trinidad (2007) reported “sample sizes ranging from 10 to 60 persons” (p. 1375) for grounded studies. The rationale behind the number is the need to gain insight from different types of experiences until the achievement of theoretical saturation is yielded from several data constructs.

Phenomenology does not present the same challenge because the sample size can be under ten as described in a transitional study by Jones & Gragg (2012) that examined perceptions of three foster youth. In another study seven participants from Canada participated in an email correspondence with Aquino-Russell (2006) who lived on another continent. The experiment focused on *The Lived Experience of Persons Having a Different Sense of Hearing*. Confidentiality was preserved by saving email responses on a disc then information was deleted. As with grounded theory the use of memos is fundamental for phenomenological research to capture thoughts of the investigator as new revelations evolve from continuous review of the data. This process also serves as a recordkeeping document to ultimately formulate meaning of the lived experience from individual participants. Philosophy surrounding phenomenology centered on the concept that individuals with commonalities provide the ingredients to construct reality based on shared perceptions drawn from experience and consciousness.

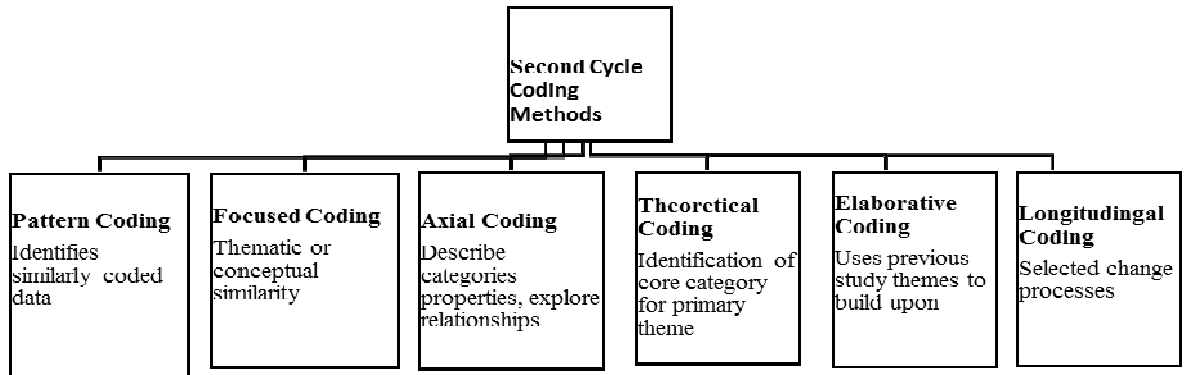


Figure 1: Second Cycle Coding Methods. Saldana (2013, p. 209) summarized six types of coding

These mere paragraphs describe a minute historical background of philosophy associated with the 20th century German scholar Edmund Gustav Albrecht Husserl born of Jewish descent who began the school of phenomenology under the premise that knowledge lies in experience which was opposite of the rule of thinking for scientists following positivism. The acceptance of phenomenology was controversial yet represented a pivotal turn for a scholar trained in mathematics, physics, astronomy, and eventually obtained a doctorate in mathematics. Husserl embraced the gift of knowledge and accepted the invitation to indulge in learning about the field of psychology similar to his mentor.

Husserl managed to breathe in the wealth of knowledge and glide along the path of life as waves direct the movements of a surfer, never losing sight of his individualism nor abandon his religious Lutheran background rooted in New Testament Teachings. One of Husserl's professors Herbert Spiegelberg (1982) believed his student was led on a mission for God to find different approaches to philosophy and science. Phenomenology has been adopted in other countries since its inception by Husserl. In qualitative research the epistemology that reflects meaning derived from the experience of human beings interaction with objects or the natural environment is closely related to subjectivism appropriately suited for phenomenology research.

To construct meaning rooted in communication then trace the process in which information becomes transferred within specific environments led to another methodology discovery called discourse analysis which provides tools to exemplify components of reality not fully uncovered through language. Paulus, Lester, and Britt (2013) conducted research based on the premise "that the metaphors evoked and discourses used around technology were always *doing* something" (p. 642) which laid a foundation to analyze the manner in which beginning qualitative students discovered the relationship between technology and qualitative research.

Eleven introductory qualitative textbooks were probed for content. Key words used for the search engine process targeted three focused areas.

Methods used in the cross-cased discourse data analysis project entailed coding and memos. Relevant textbook content was coded into broad categories. Documentation was maintained for the duration of the experiment by “analytical and theoretical memos” (p. 642). Cross-case data analysis revealed differences between individual author’s style to evaluate the manner in which technology was positioned or referenced in the text. Discourse analysis provided a simplistic analytical approach to present facts in a way that specifically illustrated limitations of certain textbooks examined. The research revealed technology was alluded to by academic staff as a tool beneficial for students in the data analysis process yet limited use for other aspects of the research process.

In an attempt to display triangulation for the D/HH research design, discourse analysis becomes a method to use in addition to interviews. The beauty of using discourse analysis is that content already exists. For instance, to review university language available online as a guidance tool for D/HH students, an electronic search on the University of Michigan’s website populated the following information using key terms *student* and *deaf* independently in the search engine:

All academic accommodations for **students** with disabilities are handled through the Office of Services for **Students** with Disabilities (SSD). It is important to make an appointment to ... (ABI) **Students** with visual impairments **Deaf** and hard of hearing **students Students** with mobility impairments (Rackham Graduate School (a), para. 1).

... Rackham Graduate School is dedicated to helping all graduate **students** at the University of Michigan with the resources they need to be ... (ABI) **Students** with visual impairments **Deaf** and hard of hearing **students Students** with mobility impairments (Rackham Graduate School (b), para..1)

... blog It’s free, confidential and we offer **students** with disabilities on campus an array of services, equipment and ... and sign language interpreters for **students** who are **deaf**/hard of hearing, scans books for those with print disabilities, and ...(Reilly, para. 1)

From a constructivist approach Galasiński and Ziółkowska (2013) studied language using discourse analysis to review patient-doctor clinical psychiatry encounters which contained patient interviews and transferring notes within medical records. The assumption “that discursive representations, whether linguistic (spoken or written) or visual are not transparent, but, rather, construct reality as much as they represent it” (p. 592). In this scenario physicians translate information and become the instrument as described: “The doctor has to organize the data from the interview into a clear note which addresses the specific and diagnostically and therapeutically relevant information” (p. 590).

Specifically, the goal was to “focus on the process of information management in psychiatry and, more particularly, trace the information which was recorded in the patients’ notes back to its origin in the interview” (p. 589). One limitation identified focused on language. Polish notes were translated into English and a degree of misinterpretation of the *flavor* was noted and relevant in considering any communication interpreted through the use of sign language between hearing and non-hearing individuals.

Ethnography – Exploratory Interview Method

As a qualitative researcher the work of Galasiński and Ziółkowska (2013) amplifies the impact of not using exact words spoken by the patient(s) in response to follow-up comments and/or questions asked by the physician. In qualitative research semi-interviews are often used by the researcher as a method to capture data from participants. The above mentioned investigators were careful not to blatantly state that physicians intentionally falsified records. Several examples listed below reveal documentation recorded in medical records reflective of the patient’s mental state was solely based on language used by the physician to coerce the patients’ words:

Example 1

Doctor's notes:

(1a)

(She) admits that she is nervous by nature. Easily put out, "I treat nerves by cigarettes."
This is accompanied by internal anxiety, "then I start to stammer. . ."

Interview:

(1b)

Doctor: By nature, before you got sick, were you a nervous or a quiet person?

Patient: I was very energetic.

D: Energetic, so lively, right? So one could say you were a little bit nervous too? Was it easy to irritate you?

P: I simply got neurosis during my university studies and it all started from the neurosis.

D: What about these nerves at the moment?

P: Well, it varies.

D: Do some trivia put you out easily now?

P: Also.

D: It happens yes?

P: Yes yes. (p. 591)

This partial segment of the transcript elicited disturbing sentiments because in some ways patients can be considered part of a vulnerable population if not given rights to dispute or review information contained in medical records. It is not known if patients in another country have access to medical records or if it would even apply in a situation with psychiatric patients. One ethical responsibility of a qualitative researcher is to ensure information obtained from an interview actually reflects account of participant's experience, not the investigator which is a reminder of the importance of peer-checking. However, peer-checking seems irrelevant if I, the instrument, have influenced the outcomes of the data which in this case are the interview responses. Ramification of false information could have extreme consequences that ultimately harm the patient even if unintentional. From a qualitative perspective misrepresentation of information could damage professional relationships due to mistrust.

From a retrospective qualitative lens, the line of questioning exhibited by the psychiatric doctor was an attempt to probe the patient; yet, the method does not support elements of an

exploratory interview as defined by Schensul, Schensul, and LeCompte (1997) even if the intent was to either generate a confirmatory response from the patient or elicit additional information. Interviewing is a technique requiring a certain degree of training which aligns with one of the recommendations by the research team for physicians to gain additional training in this area. Explanatory interviews require preparation even if questions are unstructured. Questions provide an opportunity to “expand the researcher’s knowledge of areas about which little is known,” (p. 122). Schensul et al (1997) provided investigators with communication tools to probe participants further by “neutral agreement or acknowledgement of the statement... repeating what the person has said in a questioning way” (p.126) in addition to requesting more information and inquiring about the meaning of terms.

Navarro de Souza, Groleau, Loiselle (2014) explored genetic counseling by asking Ashkenazi Jewish and French Canadian women about their “experiences of and meanings attributed to their hereditary breast and ovarian cancer (HBOC) risk” (p. 666). Verbal/Exchange Codes identified within Literary and Language Methods are represented in this study (see Figure 2, p. 34). Investigators sampled 40 mutation carriers and used sampling “theoretically driven semi structured interviews,” (p. 668) which revealed from content analysis, that “these two ethnocultural groups held *divergent meanings* associated with being a BRCA carrier and different views pertaining to the illness experience and risk awareness” (p. 666). This example correlates with previous recommendations by Schensul et al (1997) on probing participants to obtain meanings of terms. Disagreement of translation will still occur even with the best intent of the researcher particularly in the field of ethnography (Brown, 2014) due to extraneous variables. One meaning of interest for the research study is to learn preferred terminology from research

participants to describe hearing loss and perceived patient safety risks others have of care delivered by D/HH healthcare professionals.

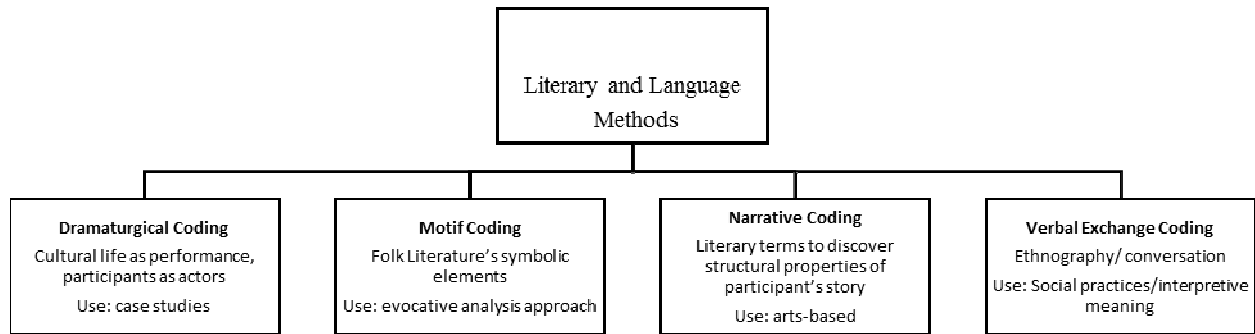


Figure 2: Literary and Language Methods. Saldana (2013, p. 123-150) summarized various codes

Trustworthiness of Social Media Data

Preliminary review of case summaries on D/HH healthcare students provoked further exploration in the literature and social media which led to the discovery of internet videos that featured a series of interviews with a University of North Carolina associate professor at Greensboro who specialized in education services and spoke about teaching in classrooms inclusive of deaf and hard-of-hearing. The video podcast interview captured by Daniel Lunk and Mike Bamford (2010) focused primarily on K-12 education learning environments but applicable to higher education classroom teaching. Deaf students experience lag time while trying to absorb information conveyed by the teacher and comments by other students. Comparing the process in which hearing students learn from listening to someone else reiterated language spoken in a different context.”...so a deaf student can miss that, so many times it would be very helpful if a regular classroom teacher could reiterate what the other student has said. That gives the deaf student a little more processing time to understand what the content of the answer was” (YouTube, video began: 00:45).

Provisional coding is an appropriate exploratory method applicable for data acquired prior to commencing interviews or fieldwork (see Figure 3, p. 36). Continued probing on the web led to a blog posted by an undergraduate Deaf and Hard-of-hearing student about the challenges of communicating with teachers and students in addition to problems with the registration process. The content of the blog revealed possible themes that were not previously discovered in the literature review nor case studies. Further engine web search yielded additional internet videos created by Music Television (MTV) filmed at Gallaudet University that depicted the lifestyle of D/HH students. One of the limitations of data available online is the uncertainty of data availability.

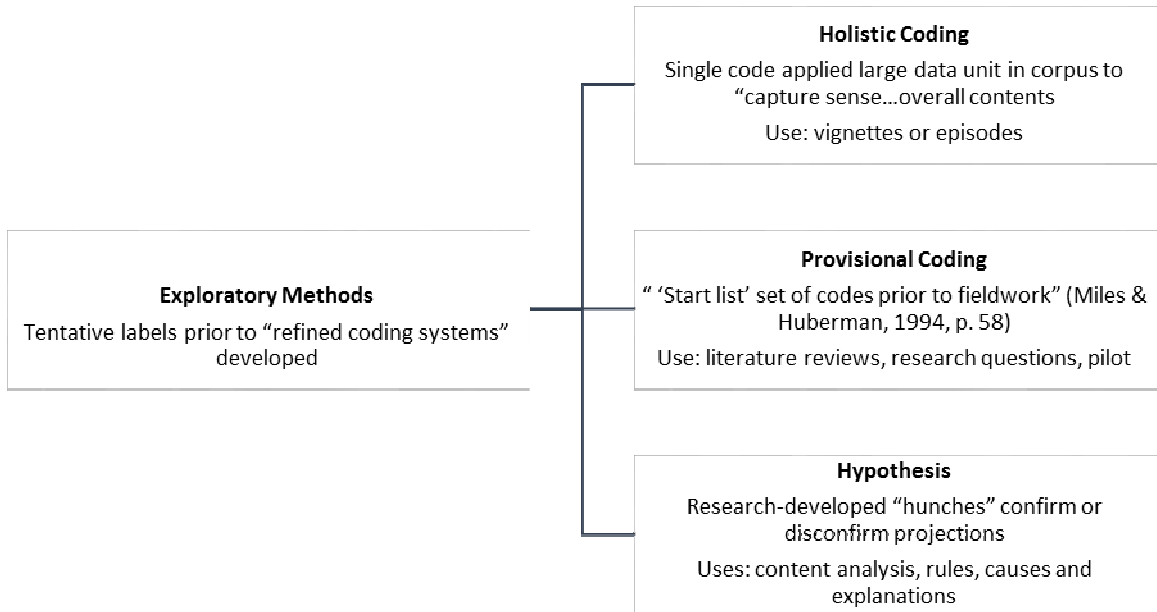


Figure 3: Exploratory Methods. Saldana (2013, p. 141-150) summarized three types of coding

Links available one day may be removed and unless videos are stored by the investigator to preserve content an issue of validating the data could arise. Information obtained via web does not substitute the obligation of an investigator to confirm information with the original source or informant as mentioned by Paulus et al (2013) while discussing generation and management of data pertaining to ethical questions, specifically, “Is it ethical to treat publically visible social networking sites as research data” (p. 645)?

This issue presents several areas to contemplate in qualitative research with the collection of data, in particular, when the instrument used to gather data was not produced by the investigative team. A researcher may indicate the name of a participant as anonymous to maintain confidentiality with the understanding that the identity of the source of information is known yet not disclosed. Occasionally videos published on internet sites (i.e., www.youtube.com) do not identify the individual who gathered the content of information and the author is listed as *anonymous*. Even if the name is present, there is still a gray area of knowing whether the data capturer is a trustworthy source relative to whether permission was actually given to use the content of published information. On *YouTube Broadcast Yourself* it appears as if anyone can post a video without being subjected to any type of monitoring.

Waite (2014) voiced a concern about relying more on interviews than participant observation. One interpretation of Waite’s viewpoint is that qualitative researchers need to gather data by using the five senses: hear, see, touch, taste, and feel which would imply that trusting too much on the work of others, specifically related to data collection, is not a characteristic to embrace nor acceptable. Qualitative research involves rigor and is comparable to the work of filmmaking described by Waite (2014) from several encounters with a documentary filmmaker

who stated that the images seen on screen in 90 minutes is disproportionate to the actual time spent filming.

David said something that stays with me to this day: He said that among documentary film makers, the adage is that if you didn't get it on film, it never happened. It doesn't work if you show up the next day and have someone tell you about something that happened the day before. You have to have been there. This requires untold hours of time "in the field" (p. 275).

This is not to declare that collection of preliminary data should never occur because certain circumstances merit the use of groundwork data; particularly in time sensitive studies which require the ability to maximize labor resources. Development of contrasting experiences of D/HH healthcare students was the focal point to build the conceptual research design including data collection methods and types of limitations. Crafting a purpose of the study led to initial thoughts about theoretical perspectives. Table 1 represents the foundation of the conceptual research design model.

Research Synthesis

Narrowing down an appropriate sampling plan for the conceptual model was derived through a process of elimination considering several methods including research synthesis used by Suri (2011) "to produce new knowledge by making explicit connections and tensions between individual study reports that were not visible before. It involves purposeful selection, review, analysis and synthesis of primary research reports on a similar topic" (p. 63). To better apprehend the concept and process of research synthesis required further investigation which began by reviewing the work of Dixon-Woods, Bonas, et al (as cited by Booth, Carroll, Ilott, Low & Cooper, 2013) on disconfirming cases. Some of the criticism equated with research synthesis stemmed from differentiation between quantitative and qualitative analytics as noted

from the response “Indeed, qualitative evidence syntheses that incorporate large numbers of study reports are often characterized as descriptive and aggregative rather than analytical and interpretative” (p. 128). This statement reiterates remarks discussed earlier about introducing methods commonly associated with quantitative analysis affects the essence of qualitative research.

Table 1
Research Design Model (Draft)

<u>Participants</u>	<u>Phenomenology</u>	<u>Survey questions designed to understand dynamics affecting learning and teaching</u>
Student	Nursing Learning Experience	<ol style="list-style-type: none"> 1. Explain process to register for classes w/accommodations 2. How do you communicate with classmates and the professor in the classroom? 3. Describe working with classmates on team projects 4. What specific resources are used in classroom, simulation labs, and clinical placement sites?
Instructor Preceptor	Teaching Nursing Students with Disabilities	<p>What type of adjustments would or have been made to accommodate a D/HH nursing student?</p> <p>Explain the experience of the D/HH student at on-site location.</p>

Federal funding from the National Institute of Nursing Research (NINR), National Institutes of Health sponsored a five-year meta-synthesis HIV Women's Health qualitative study. Sandelowski and Barroso (2003) understood there was lack of clarity related to the process of synthesis and wrote in the proposal that "Qualitative metasynthesis constitutes a specific kind of data-driven research that is analogous to quantitative meta-analysis in its intent systematically, as opposed to impressionistically (Fawcett, 1999), to combine the findings in a target domain of scientific research" (p. 782).

Findings by Glaser and Strauss (as cited by Miles & Huberman, 1984) examined the concept of synthesis associated with grounded theory during a period when the notion of studying multiple environments was not widely applied. Additional insight is gained by understanding advantages noted from comparing several types of group. "Having multiple sites increases the scope of the study and, thereby, the degrees of freedom. By comparing sites or cases, one can establish the range of generality of a finding or explanation, and at the same time, pin down the conditions which that finding will occur" (p. 151). This is precisely the plan of studying thirteen cases profiled on D/HH healthcare students and professionals.

The use of qualitative research synthesis has evolved during the past four decades. One sampling method (snowball) that will be used in the research study has a different connotation in referring to the participant interview verses research synthesis (Booth, Carroll, Ilott, Low & Cooper, 2013), "identified respondents become the starting point for identification of additional participants. In the specific context of a literature search, snowballing refers to using a known relevant item of literature to identify articles that have been cited, those that cite the article, related articles, or subject terms used by the article as a starting point for inquiry" (p. 128). Contacting the receptionist responsible for handling emails and inquiries at the National

Association of the Deaf or a director in charge of educational areas would be a starting point to connect with a former or senior nursing D/HH student. Reading case stories on D/HH students, members in academia and healthcare resulted in mentally identifying common domains: (1) age disability occurred, (2) technology used for accommodation, (3) availability of interpreter resources, (4) family support, and (5) exposure to healthcare careers.

Patton's Sampling Plans

Identifying appropriate sampling strategies was derived by comparing advantages and disadvantages listed in the literature from using one of several sixteen qualitative sampling plans. According to the 148 page task force report exploring professional healthcare careers for individuals labeled as deaf or hard-of-hearing, thirteen individuals profiled were exceptions and not the norm as indicated below:

the Task Force repeatedly saw the limitations and barriers often imposed on D/HH individuals in the health care fields. In spite of these obstacles, some D/HH individuals have succeeded as medical doctors, nurse practitioners, lab technicians, medical records technicians, pharmacists, dentists, oral hygienists, research scientists, and psychologists, among others. These success stories do not mirror the experience of most D/HH individuals. They do, however, reveal the possibilities if we create opportunities for this population (Building Pathways to Health Care Careers, 2012, p. 9).

Cases mentioned above symbolize extreme or deviant sampling. This method does not capture data descriptive of experiences for average D/HH healthcare students, a noted limitation. In considering the synthesis method, the focus becomes to describe successful outcomes in order to build a model yielding similar results for future D/HH individuals with the goal of reducing barriers for entering healthcare professional occupations. Sampling extreme cases builds upon knowledge to improve typical programs (Patton, 1987). Another benefit for examining cases not typical of most D/HH healthcare students is to establish credibility:

By seeking out disconfirming cases researchers are able to develop a richer, more in-depth understanding of a phenomenon, thus lending credibility to the resultant research account. In comparison to the averaging effect typical of quantitative syntheses, identification of the

“exception to the rule” requires that reviewers engage more extensively with the data to explore both complexity and contradictions (Booth, Carroll, Ilott, et al, p. 127).

The assumption here is to also gather data not representative of extreme or deviant sampling for comparison purposes. Search engine terms used to seek out extreme cases within the *Cochrane Collaboration Qualitative Research Methods Group* database were: negative analysis, disconfirming, and deviant cases.

Patton (1987) described an objective of discovering “shared patterns which cut across cases and which derive their significance from having emerged out of heterogeneity” (p. 53). Hypothetically in a longitudinal study, it would be beneficial not only to follow a cohort of D/HH healthcare students but also follow a cohort of non-healthcare D/HH students in professional programs where terminology is less specialized than medicine or nursing. The process of information extracted from longitudinal coding is “the data corpus is reviewed categorically, thematically, and comparatively across time to assess whether participant change may have occurred” (Saldana, 2013, p. 236-237). The main question placed before each longitudinal category answers *What* questions [See Figure 4, Appendix]. Preliminary case study data previously discussed represented maximum variation or heterogeneity sampling. The number of recruited participants for the research design study may be too small to identify as heterogeneity. Longitudinal coding is not limited to heterogeneous sampling. This proposal will not represent a longitudinal study.

Homogeneous sampling, opposite of heterogeneity, was used in nursing qualitative research projects funded by community foundations and federal agencies (National Cancer Institute/Minority Research). Findings were revealed about ethical challenges encountered by nurses serving in dual roles as healthcare provider and qualitative researcher (Eide and Kahn, 2008) detailed in one study that involved seven breast cancer patients with stage three and four

diagnosis who participated in yoga intervention where interviews were held during the first intervention then three years later. Focused group sessions occurred as "...the research participants created understandings and meaning that helped others as they took part in the research process. Interviews revealed recollection of the same key memories by several participants, but with the meaning filtered in different ways depending on the meaning that the particular event had for the person..."(p. 202).

Homogeneous sampling consist of small sample sizes with similar demographics or social characteristics (Miles, Huberman, and Saldana, 2013) as noted in the breast cancer study, Exhaustive analysis is one of the advantages for studying subgroups. One reason nursing professionals were successful in recruiting homogeneous participants was attributed to established relationships with patients who trusted them as caregivers; although this relationship was a contributing factor to ethical challenges experienced by nurses who learned of patients' needs during in-depth interviews and struggled with their dual role since nurses are trained to improve the lives of patients even in a research setting. Ortiz (2001) also observed therapeutic value gained from in-depth participant interviews conducted with wives (n=48) of professional athletes during a four year longitudinal study. Relationships between the investigator and athletes' wives did not pre-exist. Initial recruitment challenges resulted in the need to use several sampling recruitment techniques that included survey mailings and snowball sampling. Triangulation involved participant research, multiple interviews, printed documents, and diaries.

Political and criterion sampling will not be used even though obtaining better opportunities for deaf and hard-of-hearing students in professional healthcare fields is a topic of political importance. On May 19, 2010 a press conference at the U.S. Capitol was held and Congresswoman Louise Slaughter (D-N.Y.) mentioned that recent legislation passed during the

Obama administration resulted in a demand of healthcare specialists. “This challenge coincides with another, much lesser known serious challenge--the limited opportunities for qualified deaf and hard of hearing individuals in this country to pursue careers in health care” (Livadas, 2010, para.3).

Political sensitive topics are idea for funding and to attract attention of certain stakeholders (Suri, 2011), yet for the purpose of the dissertation, the primary goal is not to secure funding but to use research as a tool for assessing the educational environment for members in society underrepresented in a segment of the workforce. The issue of politics is not exclusive to sampling methods. Other factors impact the direction of research as noted in a meta-analysis constructed by Alves, Azevedo, Gonçalves, (2012) on eighteen PhD thesis from educational science students at Portugal University. Major areas examined were research questions/objectives, trends of themes, methodology utilized and types of scientific domains. Factors described by Levin and Greenwood (cited by Alves et al, 2012) which influenced the direction of research, “So, we accept that university organizational structures, power relations, discourses, and external interactions affect research methodologies and practices, in education as well as in social research in general” (p. 628).

Additional methods considered include criterion sampling which would not be feasible due to limited access and knowledge about all D/HH cases in higher educational settings. Patton (1990) defined criterion sampling as selection of every case that fell into the category of a specific criterion. Random sampling according to Miles, Huberman, and Saldana (2013) is a "gold standard of quantitative research but is used quite minimally in qualitative research because random sampling can sometimes deal you a biased hand" (p. 32). Benefits derived from convenience sampling include time savings, labor and monetary resources yet results are not

favorable related to credibility (Suri, 2011). The use of random sampling is a preferred method for institution selection to determine types of services offered to students with disabilities by conducting online search on university website. Opportunistic sampling is advantageous in data collection if other resources do not yield anticipated outcomes.

Data Analysis

Preliminary data leads to the process of data analysis. Miles and Huberman (1984) explained data reduction as one of three components in data analysis and distinctively clarified the difference between quantitative and qualitative analysis. The process of analyzing numbers is quantitative analysis verses analyzing words which defines qualitative analysis. In this context, data reduction is the process of eliminating every piece of information discovered and narrowing the focus of the study from ten possible areas to five or fewer as an example. Data reduction then leads to the second element of analysis described as data display used to summarize information in a way that easily allows vast amounts of data to be simplified with clarity usually illustrated with tables, graphs or other visual figures beneficial in compiling crisp summary reports. An example would be to substitute ten interview pages about the simulation clinical experience of a D/HH nursing student into table summaries that illustrate levels of difficulty to perform patient related tasks including equipment operation coupled with a Figure to illustrate workflow process.

Using visual aids like tables and figures mentioned above embody one of the final stages of the qualitative evaluation process. Yet, in order to arrive at this point required prerequisite steps of probing the data. A process similar to the experience of a biology freshman or sophomore student preparing for an anatomy test to identify all of the organs associated with the digestive tract or circulatory system. In preparation for the exam, many hours are spent dissecting body parts of the laboratory animal specimen to become familiar with shape of organs,

connecting tissues, muscles, or bones supporting major organs that comprise the whole system. This analogy is similar to the coding process. To gain meaningful data requires knowledge about various coding methods. An evaluator becomes equipped to classify information from various mediums and information which is visible to an observer, yet invisible to the naked eye. To witness and capture information contained in the mind and emotions of the participant, ultimately leads to the development of a phenomenological experience.

Coding

Several layers of coding schemes exist in qualitative research as shown in Table 2. First level cycle codes are classified as grammatical, elemental, affective, literary/language; exploratory, procedural, and themeing the data. Each first level coding method has subcategories. Certain coding methods are applicable for all studies and others depend on epistemology, theoretical perspective and methodology. Grammatical codes (see Figure 5, Appendix) will be used because the technique provides a display of data in a manner similar to quantitative methods. This method categorizes "...the basic grammatical principles of a technique" (Saldana, 2013, p. 69). Results from attribute and magnitude coding can be presented in graphs and tables by using features of computer assisted qualitative data analysis software (CAQDAS) such as NVivo-10 or a spreadsheet to show data. Richards and Richards (2003) discussed benefits of using advanced technology qualitative research systems like NVivo which allow investigators to extract data from various mediums (hyperlinks, rich text), and code. This method is beneficial for coding video series available online such as the show *Quiet Campus: An Unseen Look Inside Deaf Culture*. The use of NVivo provides a documented account of first and second cyclic methods in addition to thematic codes by using nodes.

A qualitative emergency room study conducted by Doran, Vashi, Platis, Curry, Rowe, Gang, and Vacus (2013) used grounded-theory and random sampling with computerize assistance from a random number generator to select residents in an effort to avoid bias. The coding team consisted of two medical doctors and one investigator with a MPH experienced in the content area. Demographic information was obtained as a result of attribute coding (see Table 3, p.53). McNulty, Zattoni, and Douglas (2013) used content analysis and several coding cycles to build a meta-analysis descriptive summary on corporate governance by categorizing segments of literature.

Table 2
First Cycle Coding Methods

<u>Methods</u>	<u>Objective</u>	<u>Application</u>
Grammatical Methods	Techniques to enhance:	<ul style="list-style-type: none"> • Organization • Nuances • Texture of qualitative research
Elemental Methods	Foundation approaches to	Code qualitative text
Affective Methods	Investigate	<ul style="list-style-type: none"> • Participant emotions • Values • Subjective qualities of human experience
Literary and Language Methods	Draw on aspects of	<ul style="list-style-type: none"> • Written communication • Oral communication for coding
Exploratory Methods	Permit	Open-ended investigation
Procedural Methods	Standardized	Ways to code
Themeing the Data	Acknowledges extended passages of code in the form of sentences can capture	<ul style="list-style-type: none"> • Essence • Essentials of participant meaning

Note: Saldana summarized seven methods, objectives and applications

Grammatical Codes	Attribute Coding Data and demographic elements Use: all studies
	Magnitude Coding Alphanumeric or symbolic codes and/ or subcodes Use: mixed methods quantitative studies
	Subcoding Second-order tag after primary code for additional detail Use: general codes require more labeling
	Simultaneous Coding Multiple coding Use: codes for data overlap

Figure 5: Grammatical Methods Contain Multiple Coding Techniques. Summarized from *The Coding Manual for Qualitative Research* (p. 69-81) by J. Saldana, 2013

Attribute coding was a method used to code each article using thirteen fields. Numbers contained in () do not represent codes, but individual fields to display results: (1) date of publication, (2) country of the qualitative scholars' attributed work institution, (3) number of scholars, (4) journal's title, (5) main topic, (6) discipline and theoretical perspectives, (7) number of disciplinary frameworks (8) theoretical aim, (9) research setting, (10) number of research settings, (11) sources of data, (12) number of sources of data, and (13) level of analysis. Displaying results in a graph as oppose to the above method creates a simplistic process for peer checking as illustrated in Table 4.

Another set of codes (emotion, values, versus, evaluation) categorized as affective methods (see Figure 6, Appendix) are useful in qualitative research to code for emotions depictive of characteristics naked to the human eye often classified as heart-filled desires and motivations (Nuttall, Shankar, Beverland and Stallworth-Hooper, 2011). These codes do not provide substance for objectivity.

Table 3
 Magnitude and Attribute Coding: *Interviews with Emergency Medicine Residents*

<u>Locations:</u>	<u>Site: A</u>	<u>Site: B</u>
Characteristics:	N=11	N=12
Gender:		
• Male	6	6
• Female	5	6
Years of Postgraduate Training:	Residents	Residents
• 1	2	3
• 2	3	3
• 3	3	3
• 4	3	3

Note. Interviewed February–September 2012. Study conducted by Doran, Vashi, Platis, et al, 2013 p. S357)

Table 4
Numeric Coding using Content Analysis on Governance

<u>Decade Article Published</u>	<u>Numeric Value Code</u>
before 1990	1
between 1990 – 1999	2
between 2000 and 2009	3
in 2010 or after	4

Note. McNulty, Zatooni and Douglas (p. 186-187)

The final set of codes considered are classified as elemental methods comprised of structural, descriptive, in vivo, process and initial coding. Wee and Paterson (2009) evaluated factors for individuals classified with disabilities and used triangulation in the coding plan. Subcoding will also be used. One investigator realized that steps for coding do not necessarily occur sequentially but simultaneously which differed from a model related to analysis-synthesis in which the process described was to read data responses, then re-read prior to coding. Santopinto stated, "Sequencing the stages of Giorgi's modification occurs only in concept, in the actual research practice they are performed simultaneously (cited by Acquino Russell, 2006, p. 341).

CHAPTER 3: METHODOLOGY

Research Design

The purpose of the research is to determine appropriate evaluation strategies to assess the higher learning experience of nursing students with hearing loss. By using phenomenology as the methodology in the research design provides an opportunity to reflect meaning derived from experiences of current and/or alumni postsecondary students. Constructing a model centered on the Deaf and Hard-of-Hearing (D/HH) culture requires further understanding of sampling plans most suited to recruit D/HH clinical nursing students and/or professionals. Deaf and Hard of Hearing nursing employees represent a very small percentage of healthcare professionals.

Transcription and coding are methods used to build upon the work of videographers available on social media (YouTube) and secondary data compiled from case summaries of focus groups on Deaf and Hard of Hearing clinical students and alumni. The objective is to seek out unique coding techniques to explain not only how interaction occurs between students with objects (i.e. technology) and in the hospital environment, but also to yield data not obtained through observation with the naked eye. This concept is also applicable with participant written survey responses having a goal of discovering perceptions hidden in the consciousness while using appropriate codes. The research questions for the study are:

1. What are the advantages and disadvantages of using visual ethnography methods verses focus group secondary data for evaluating experiences of D/HH culture?
2. Which sampling plan(s) was most effective to recruit D/HH nursing participants?
3. What type of benefits were gained from using multiple coding strategies?
4. What type of obstacles were encountered by Deaf and Hard of Hearing nursing students in classrooms or during clinical training?
5. Which type of technology had a positive impact on the learning experience of clinical students with a hearing disability?

Social interpretivism will be used as the theoretical perspective and constructivism selected for the epistemology. Several sampling plans will be explored for participant recruitment including snowball and opportunistic. First and second coding techniques such as grammatical, exploratory, and thematic are coding options.

Accessible Population and Sample

The sample size desired for primary data recruitment is one to three. Sample size for secondary data consist of 11 videos from social media and 13 narrative profile summaries. Rationale for this approach is due to limited resources of national databases with contact information on D/HH alumni or currently enrolled higher education students. Therefore, an alternative sampling method (heterogeneous) is required to identify undergraduates exclusive of enrollees at colleges or universities (i.e., Gallaudet and RIT) specifically designed to create programs tailored for Deaf and Hard of Hearing students.

Therefore, social media is one medium used as a data source to identify videos in which D/HH individuals are featured explaining their experience at a college or university. Key words and/or phrases used for search engine are: *deaf*, *deaf students*, *deaf college students*, *deaf nursing students*, and *deaf medical students*. This method is practical and advantageous since video analysis is under the umbrella of qualitative research and training has been received in advanced ethnography studies.

Data Gathering and Coding

Process of filtering begins by selecting videos that list (1) name of college or university as source; (2) student's full name; (3) questions shown in the video; and (4) clarity of speech if written responses do not appear. The goal is to transcribe at least eleven short videos under five minutes in length. One potential source of error categorized as an internal variable is

misinterpretation of translating speech, in addition to, making assumptions of questions proposed to the D/HH student, in the absence of audible or written questions. Two types of equipment used for transcription are the laptop and cell phone. Exact techniques to transcribe written or spoken words of the deaf and hard of hearing captured in a video is to have the researcher use word processing software equipment in laptop to type exact language interpreted or said. Each video is frequently replayed, pressing pause icon and rewind feature to transcribe correctly. An alternative option is to use voice recognition feature on cell phone to record speech and edit as needed for accuracy.

One expected outcome is to have a heterogeneous video sample of non-clinical and clinical D/HH students. Theming the data is a preferred first cycle coding method desired for the identification of terms and meanings given by D/HH students. An example is to discover terms used to describe hearing loss and self-identity. Affective methods are necessary to capture stated feelings of D/HH individuals by emotion coding while observing a video with words capturing sign language or speech. Value coding provides an opportunity to classify stated values or belief systems.

The second set of data comprised of thirteen D/HH health students and professionals interviewed by members of a national task force enabled identification of conceptual themes and similarities of a given culture through focused coding. The third phase of data collection centers on snowball technique needed to recruit at least one D/HH nursing participant for an in-depth written interview using an email survey with several questions derived from common themes which appeared in the literature review and narrative summary profiles of D/HH students and alumni healthcare professionals interviewed by task force.

Grammatical methods, a first cycling coding process, provide a way to collect data elements through attribute coding to record unique identifiers such as: (1) video title, (2) author, (3) author title if given (4) date video uploaded, (5) date video obtained, (6) number of views (7) length of video in minutes, and (8) URL address. The following two data fields were extracted based on observation by the researcher: (9) race and (10) gender; a level of error could occur interpreting ethnicity/race solely by appearance affecting demographic aggregate results. Remaining two data fields were retrieved from written information labelled as video source and/or mentioned in the narrative D/HH video: (11) field of study/major and (12) name of university/college. A content analysis search will be conducted on the main website of higher institutions attended by D/HH students by using a random sampling method for institution selection. The purpose is to learn types of resources available to deaf and hard of hearing individuals. N-Vivo 10 is the software used for analysis as a tool to display results in the format of Figures, charts and tables. Figure 7 (p. 59) provides an overall summary of proposed research evaluation methods.

Reliability and Credibility

Descriptive data elements (1-8) are beneficial to reproduce data collection procedures. There is a possibility that data from video medium may not be present after a period of time on the web. A print screen will be used to capture language appearing on institution websites pertaining to types of resources available for D/HH. Applying numerous data collection methods is advantageous for credibility and to ascertain triangulation.

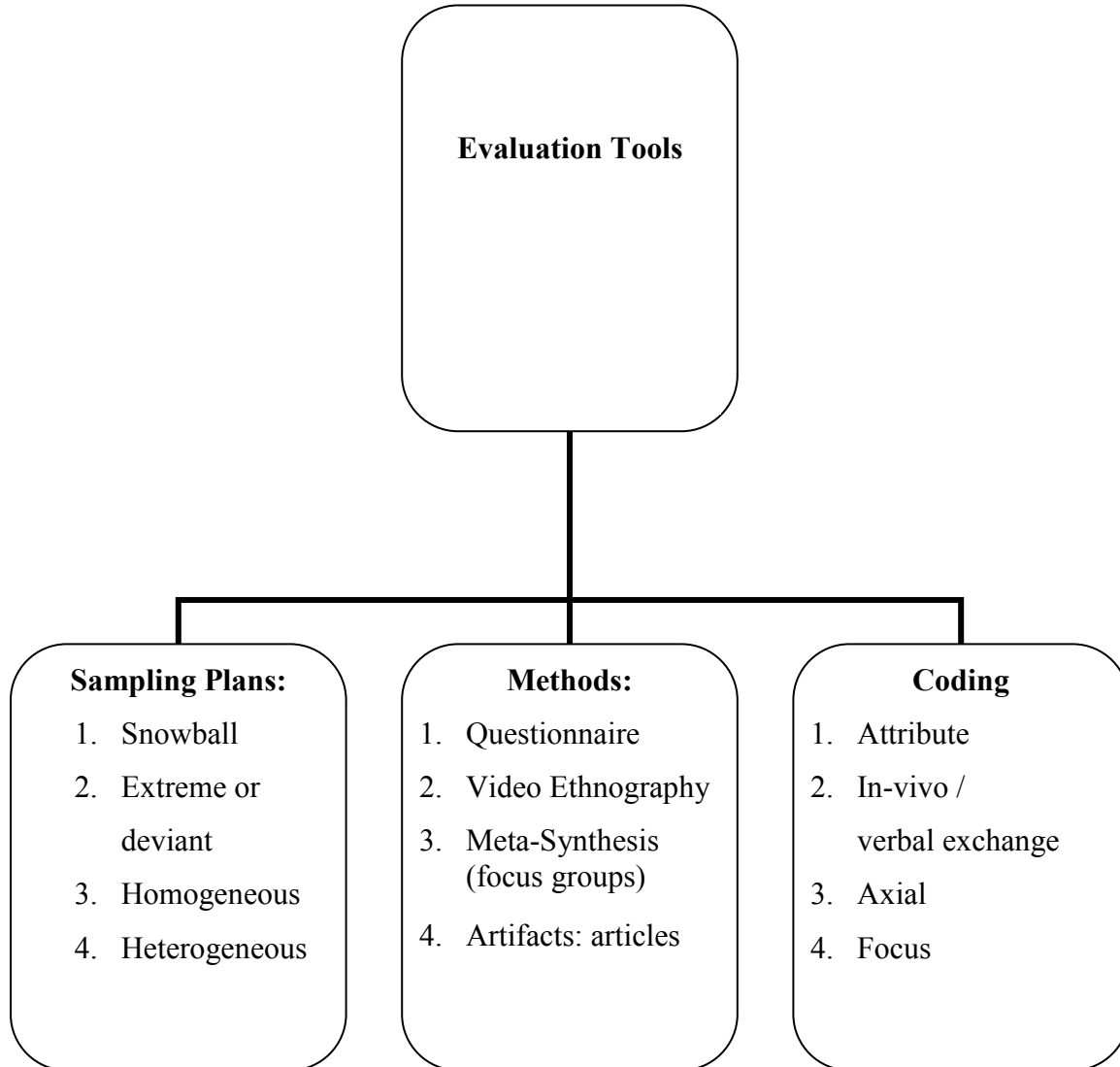


Figure 7
Evaluation Methods for Higher Learning Experience of Deaf and Hard of Hearing

Limitations surrounding in-person interviews with deaf and hard of hearing participants arise related to accuracy during translation of questions and interpreting responses if interpreter is needed. Individuals with some degree of hearing loss might require a specialized telecommunication device to converse via telephone, therefore, electronic medium is the preferred choice of communication via emails to conduct interviews after obtaining written consent (see Appendix B) from D/HH participants.

CHAPTER 4: DATA RESULTS

Demographics

Academic and professional backgrounds of twenty-eight individuals were analyzed for the intent of constructing a heterogeneous model composed of students and alumni from health and non-health majors at post-secondary institutions. Individuals, referred to as participants, were identified and selected from numerous sources of data: surveys (2), articles (2), videos (10), and a meta-synthesis of focus-group interviews (13). The gender divide was 32% male and 68% female. More than half of participants were either born and/or received primary and secondary education in the following United States regions: Mid-East (6), Far West (4), Southeast (3), Great Lakes (2), and Plains (1) based on Bureau of Economic Analysis classification system. Participants (3) who attended international institutions were excluded from above counts. No information was available on remaining group, approximately one-third of total participants.

Regarding education, nineteen participants were either in pursuit of, or had obtained degrees in health related fields such as nursing (7), public health (2), medicine (2), audiology (2) and science (6). Non-health majors (5) consisted of: English (1), law (1), teaching (1), communications (1) and fine arts (1). Information was not recorded for remaining students (4). Nearly 40% of individuals attended private undergraduate institutions and 25% attended public institutions. Four international institutions were not coded and information was unknown for six participants.

One taxonomic category, education was divided into three subcategories: undergraduate, master, and terminal degree programs. Terminal degree programs included law, medicine, and doctorate of philosophy. Undergraduate schools were listed for 22 of 28 participants. Twenty-four percent of students and alumni attended undergraduate programs where the institution was

ranked high in research activity according to Carnegie classification. A total of six students were enrolled in undergraduate programs.

Acceptance and near program completion of undergraduate requirements still did not ease the mind of certain participants who desired to continue higher education studies. Concerns of a few students related to finances as they contemplated the pursuit of graduate school. The question of whether graduate schools would pay for costs associated with interpreters was a fear of one student. A nursing student had the same concern and wondered if potential employers would cover needed accommodation costs. Remarks by a female professor affirmed these concerns. She reflected on a past incident stemmed from refusal of college administrators to grant an externship after observing the presence of an interpreter during the interview. Administrators concluded accommodations were associated with expensive costs.

“We need to come up with creative ways to remove the financial constraints that prevent deaf professionals from contemplating working in the health care field,” sentiments expressed by a medical professor (Scott Smith, Focus Group Participant 8, comments appeared in “Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community - Final Report,” 2012). “Ideally, deaf or hard-of-hearing people desiring health care careers would have the means AND opportunity to pursue their dreams, and be treated as a valued member of society with respect just like anyone else” (Carolyn Stern, Focus Group Participant 13, comments appeared in “Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community – Final Report,” 2012).

Graduate school results revealed that slightly more than one-third (11) of participants excluding 2 international participants received master degrees primarily at private institutions (7) ranked high in research activity which included: George Washington University, Dartmouth,

John Hopkins University, Harvard, Gallaudet and a few public institutions (2): University of Michigan and University of California, Davis. Terminal degrees were also awarded in fields of law, medicine and doctorate of philosophy to six participants, some of which were previously accounted for in the above category. Public health, biochemistry, pharmaceuticals, cell and molecular biology were other fields of study not previously mentioned as participants' majors.

Total number of degrees earned by four (16%) participants on an individual basis was three followed by eight participants awarded two types of degrees. Overall, there were 14 students, 2 recent graduates, a combination of 9 faculty and clinicians in the study. In some cases, faculty also held title of clinician. The remaining three participants were a K-12 teacher (1), an attorney-at-law (1) and occupation of last participant was unknown.

Hearing Loss

Age of hearing loss was unknown for 39% (11) of all participants. There is some discrepancy related to onset of hearing loss and period of diagnosis. Nearly 17% (5) of total participants described that loss of hearing occurred at birth, 10% (3) mentioned twelve months and below; 14% (4) experienced loss at twenty-four months; and 10% (3) between thirty to thirty-six months. A few were above the age of five. Diagnosis of meningitis was associated with hearing loss for a few participants.

The level or intensity of hearing loss was derived by examining language stated by each participant. The term deaf was mentioned by more than half (17) of total participants (N=28). Other terms used included: severe hearing loss (1), deaf/hard-of-hearing (1), deaf-blind (1), child-of-deaf adults (1), and profound deaf (1).

1. I was the first **deaf/hard-of-hearing** individual to go there
2. I wanted to find out how I became **deaf**

3. I don't want them to reject me because I am **deaf**
4. I did not have any **deaf role models** before or during my health care education
5. I go into the patients' rooms with confidence, introduce myself and tell the patients that I am **deaf** and will rely on interpreters as needed
6. The stigma of deafness comes and goes. It was often difficult to distinguish between people doubting me because I am **deaf** or treating me like any other lowly Ph.D. student.

If a participant did not use specific words to describe individual hearing loss, then words used to describe other members in the culture were reviewed. Examples are highlighted below in bold:

7. In order to bring more **deaf** people into the health care system as providers
8. My inability to secure a place for more than two years now indicates that the job market, though ripe for pharmacists, is not receptive to the idea of a **deaf** pharmacist.
9. ...believes strongly that rapidly advancing technology is a boom for **Deaf** people interested in health care careers.

Support: Role of Parents

Information was scarce about parents' hearing level. Data was available on eight participants. Five individuals were born to hearing parents and three were born to parents who did not hear. One D/HH professional employed as a teacher spoke about her relationship with her father:

As a teenager, I realized then that I was a CODA, a Child of Deaf Adults. I was bilingual and bi-cultural and tired of it all. I didn't want it anymore. And trust me, if your father was my father, you would get how I felt. My father's dreams for me to be an interpreter or a deaf educator were about to be shattered. That wasn't my dream. Only, I was going to decide what I was going to do. And I decided to leave the deaf world, so I did (Gallaudet/Video, 2009).

A student majoring in English presented facts to an audience about D/HH children born to hearing parents and shared her story. "I was born to hearing parents who did not know sign

language and who knew almost nothing about deafness when they had me. This is not too uncommon among children who are born deaf” (TEDx Talks, 2013).

The subject of parental support was a theme repeatedly alluded to by participants. One nurse stated, “My mother was my number one supporter and she made sure I had the same opportunities as everyone else” (Kellye Nelson, Focus Group Participant 1, comments appeared in “Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community - Final Report,” 2012). Parents became instrumental in the educational journey of a D/HH son or daughter. Other participants credited their parents not allowing disability to hinder education. Additional roles of parents spanned from monitoring classwork assignments to ensuring student did not fall behind work of peers; and using creativity to make reading enjoyable.

At times, communication barriers between hearing parents and D/HH child resulted in home adjustments and the need to acquire new skills. One student remarked, “They learned sign language.” This statement is beneficial to understand the amount of parental effort required to enhance communications. Also worth noting, parents do not necessarily inherit innate skills or a guidebook on raising a D/HH son or daughter.

Mothers and fathers often relied on advice or counsel from educators and other professionals in the community for guidance related to the overall development of the student. One teacher eased the mind of a parent who desired for his deaf/blind daughter to have exposure to the arts:

I remember my father wanted me to take piano or dance lessons, but he was worried that the average piano instructor wouldn't know how to work with a child with a disability. When my father shared his concerns with Ms. Fran Deble, she recommended a dance studio and went out of her way to talk with the dance instructor about making sure I could fully participate (Gima, H., 2014)

As a result of the father's effort, his daughter eventually landed a spot on the ballroom dance team of an Ivy League University and made history as a graduate from Harvard's Law School.

On other occasions, parents had to choose whether D/HH child was educated in mainstream schools or in educational environment specifically designed to cater to the needs of pupils with various levels of hearing loss. While passing through their own journey, parents had to trust their instincts, even when advised by members in the community not to make decisions that would potentially expose child to risks.

One student's parents were advised not to let child take horse riding lessons. Parents did not succumb to advice nor initial rejection from horse instructor who refused to provide lessons to D/HH child. The child became a student at Stanford University and said, "Now horses are one of the most important things in my life. They give me a purely physical language and a way of communicating without words" (TEDx Talks, 2013).

Advice for Future Students

Deaf and Hard of Hearing students admitted into post-secondary institutions were recognized as members of an extreme sampling group, primarily because outcomes previously discussed were atypical for the average D/HH student. Three individuals explained they were pioneers who carved a path for others. Participants' words of wisdom could shape a canvas with the following colorful words: dream possession, accountability, emotional anchorage, and seize opportunity.

Advice for future cohorts can be found in the following remarks:

- When we are children, I don't think we inherently believe that we can't do things. We need to hold on to this belief as we grow older. It can be a constant battle against the expectations of others, even against ourselves (TEDx Talks, 2013).
- One of the best lessons I received from a special education teacher involved learning to take responsibility for my own education, a lesson that helped prepare me for college (Gima, 2014).
- It is okay to feel very pressure. They want you to be equal with hearing people. They will not look down on you because they want you to be very challenged person. Don't focus on limitations. Learn more. Show what's inside you and be yourself. If they think you are not good enough, come on. Don't let your self-esteem low. Show them that you can! Do better than them. Prove them wrong. Look at me. I challenged them all the (time) though. I want you to do the same, Challenge it! (Rebucas, 2012)

- What I would like to convey to you in the deaf community is that you take a look at me. I'm successful; I'm here at the university. I'm trying to complete my goals. If there's something that you want in your life and you really want that, you have to go through a lot. Yeah, there'll be a lot of obstacles, but if you have a positive attitude. Then you can get through it and be fine. Once you attain your goals and you look back and you think, "Wow, "you'll realize that you did a wonderful job, and you'll be happy. If you want it, you can get it. You have to chase after it; you have to be assertive. You have to be strong and you have to be positive (North Carolina Dept. Health and Human Services, 2010).
- I absolutely encourage any Deaf, blind, disabled, anybody with a disability to apply for medical school. It really should be no limitations. It really should be based on my experience. You really have an opportunity to be a leader in medicine (University of California Davis Health Systems, 2010).
- How will you lead the next generation? Will you strive ahead and perspiration and determination taking risks? Or will you walk backwards in hopes of finding an easier life. I was meant to be here today and so were all of you. Today as we graduate from this great place of higher learning the only university of it's kind, please keep Lincoln's words in mind and ask yourself, will I walk slowly and forge my way ahead or will I turn back from the opportunities that await me (Gallaudet/Video, 2009).

Support: Role Models

To create a successful preparation model for D/HH students entering post-secondary education would entail several layers. The foundational structure contains one key ingredient, individual determination, followed by layers filled with support from parents and teachers. Another layer forms as a result of an interactive explosion ignited between the pairing of a dreamer with someone who already experienced the dream. These individuals are referred to as role models. Encounters with role models did not always take place in-person.

The power of reading about professionals was very instrumental, in addition to, opportunities that transpired for D/HH students to shadow professionals who were also deaf or hard of hearing. These experiences occurred within K-12 and post-secondary environments. After graduation, one individual joined a professional organization and experienced numerous occasions to interact directly with professionals with similar backgrounds who shared a common disability. Yet, not all role models were individuals with a hearing loss. One D/HH physician

was influenced earlier in life by medical professionals responsible for her health. She developed an admiration.

In essence, whether the encounter between the student and role model was by way of print which transfigured words of a profession into the imagination of a D/HH student; or by means of a microscopic encounter that allowed the student to shadow in a health care environment. The outcomes could be described as a catalyst which converted potential energy into kinetic. Shadowing presented the venue for one student to confront a mental communication fear about patients. He pondered a few ideas to resolve the issue. Other comments from participants were:

1. I thought it was possible when I saw others were doing it
2. They taught me that the world is only limited by your perspective of it
3. This organization gave me hope
4. They helped guide my decision
5. Learned a lot about communication issues...I have figured out a few methods to overcome those obstacles – I could type and have a computer voice for me, or get an assistant to help interpret.

Impressions: Beginning Years through Secondary Education

Childhood experiences, television shows, and political figures left memorable impressions on four D/HH participants. A physician reminisced about a gift received as a child, “I was about 10 years old when my aunt bought me one of those plastic anatomy dolls that you can assemble different body parts and I really enjoyed that and always loved the surgery part of medicine” (Edmonton Journal, 2014). Two nurses also recalled childhood memories.

I was sick a lot as a child with asthma and my mother died of breast cancer. I received and saw the excellent care that was given to me and my mother from the nurses and wanted to be able to help other people the same way (Focus Group Participant 1).

Ever since I was a child watching ER shows with my mom, I was nosy. I wanted to know how did that happen? What they did to help them and their outcome (Anonymous, Survey 1 Participant, 2015).

A United States president inspired a D/HH educator:

I was very young when I first heard the name of Abraham Lincoln. And that name sparked my fascination (of) history, books, education and why people do what they do and make the decisions they do. Abraham Lincoln said, “I am a slow walker, but I never walk backwards.” Lincoln was not really talking about speed, rather he was talking about making progress, standing by your decisions and never turning back on a commitment (Gallaudet/Video, 2009).

Improving the lives of others with disabilities were reasons noted by two other scholars:

Working to improve education for students with disabilities is important to me. My knowledge in special education has expanded through this summer internship with the U.S. Department of Education Office for Civil Rights A good quality education helps children for good productive lives (Gima, 2014).

Language is precious to me. I’m majoring in English and I want to be a writer. This is not necessarily the norm for many deaf people. But I’ve always known it (TEDx Talks., 2013).

Others explained a desire to work in health care as an opportunity to exhibit compassion to patients and serve as an advocate, in addition to, increasing the number of Deaf and Hard-of-hearing representatives in the field.

I chose to enroll in the public health program because I wanted to learn how to be more effective in the community not just in my clinic setting itself but beyond that. It’s so important to treat somebody not as an individual but in the context of their environment (University of California Davis Health Systems, 2013).

So I love clinical medicine, but I also want to go down that route of policy change and things like that. And that’s why I’m in that program. I’m really interested in educating related to health to the deaf community because they lack access to that information because a lot of the information is accessible through English only, not in their language, which is American Sign Language, (Edmonton Journal, 2014).

Exchange of Words

Communication in higher learning between D/HH students and faculty revealed that the rate in which professors speak can present challenges if speech is too fast for individuals who primarily rely on the technique of lip reading. Facial-featured expressions, beards, mustaches, and accents can present interference for word interpretation. Even in optimum positive

conditions, at least two students commented that comprehension of words interpreted through lip reading is low. A Deaf and Hard-of-Hearing student enrolled at an international university said:

The biggest challenge of being deaf... is some people do not understand what I have to say and I don't understand what people have to say. That really is a skill set that you have to develop over time and even now with sentences I could probably only get to 5% of what they say depending on my skill level and also depending on facial features that people have cause with a big mustache or fat beard that really is hard to read or a person with very tight lip that as well... really complicates is the biggest challenge (Student, 2010),

Group conversation with hearing individuals are also problematic as expressed below:

One of the most difficult situations for me there are, is any kind of group conversation where people are not signing. I communicate fine face-to-face. But walking into those kinds of group conversations is like watching a world championship ping-pong match with ten different people and half a dozen balls. There's too much going on to get much of it (TEDx Talks, 2013).

A recommendation by a D/HH learner to educators was not to be intimidated or fearful to speak. Be mindful to slow down. Another student said, "We get 25% of what you say until we get to know you well, then we do even better (Student, 2010)." Additional suggestions were for educators to continue receiving specialized training. Be creative as students and professors collaborate and make adjustments.

During a formal presentation, one student who had taken eighteen years of speech therapy chose to talk as opposed to sign language. People thought the student had an accent and resided in a foreign country as explained:

I've always known my speech isn't perfect-but week after week I'd go back to try to make it better. I did this even when I had come to terms with my own difference. Even now, oftentimes I'll meet a new person and that person will look at me and say, "I can't quite place your accent, are you from England?" [laughter] Or they'll ask me, "Are you from Australia?" [laughter] Or even, "Are you from Scandinavia?" I have other places. And I say "No, I'm from New Mexico." [laughter] It can be fun to be perceived as more exotic than I actually am (TEDx Talks, 2013).

Feedback received has changed from childhood to adulthood. Earlier recommendations from a teacher discouraged oral presentations on the basis of difficulty for others to understand. Although words were not remembered verbatim, the deaf student provided an account from a former middle-school teacher, "you should never speak like that in front of a group without an

interpreter. It is not fair to anyone who has listen to you,” (2013). Choosing to speak has been advantageous for a biomedical engineering graduate who said:

I love communicating in all forms, shapes, various sizes and forms. And, um, I just enjoy communicating and it’s been one of my strongest suits. And I believe that talking has made me a better communicator and I enjoy it very immensely (AG Bell Association, 2009).

Communication through speech is not the preferable method, for all, as expressed by an African American male student during discussion about several tools used to exchange language:

Well, there’s three ways in order to communicate with hearing people. The first of which would be taking notes, doesn’t happen all the time or I can try and lip-read them. Lots of hearing people like to try to get me to lip-read and communicate that way, and if that doesn’t work, we go back to note-taking or gesturing and I will point and say, “I’m going this way.” And that’s the ways that I can use to communicate with hearing people. Well, maybe you’ve noticed that I try to understand by lip-reading and sometimes I do try to talk, but I don’t always. You know, mostly I try to gesture, and that’s really key to me as communicating with hearing people is gesturing (North Carolina Dept. Health and Human Services, 2010).

Types of Accommodations

In post-secondary classrooms, the most frequently used accommodation mentioned was interpreting services, specifically American Sign Language followed by video, real-time, and C-Print also referred to as text interpreting. Slightly less than 20% of participants (5) used note taking. During special circumstances, classmates became a useful resource for D/HH student:

It was not that easy for me to cope and also was very difficult for them to handle with Deaf student like me for the first time. But we, students and professors, we’re still keeping on adjusting. I’ve had an interpreter, it was hard to catch up with the lessons sometimes since the professor lectured too fast and I was not able to get the lesson. I had to do is to take a record with the tape recorder during general education classes such as math, English, history etc. During the fine arts subjects, sometimes it was very stressful but fun learning so many new things I have never seen before. Sometimes they were very annoying because they gave us very hard time, but they were very amazing professors. Sometimes my classmates were helpful when there was no interpreter available (Rebucas, 2012)

An important concept for university administrators to grasp is that there is no standard accommodation that fits all students according to a legal scholar:

The solutions that work for one deafblind student may not work for another. Students, teachers, and staff need to research solutions, or create new ones. In K-12, the responsibility fell on my teachers to find the solutions that worked for me. Kids lack the knowledge and advocacy skills to determine how best to accommodate disabilities, so trained teachers are essential. By contrast,

college and law school required an interactive process where I needed to initiate many of the requests for accommodations (Gima, 2014).

The value of an interpreter was instrumental to one physician during medical school who made the transition from utilizing note takers to relying on American Sign Language interpreters. They not only interpret, but navigate the student during clinical rotations and help adapt the student in group settings. Accommodations need to be researched to identify suitable technology as was the case with one student.

I did not request voice transliteration in college because I had never heard of it, nor had the college. In my law school classes, voice transliterators sit in the back of the classroom and speak into a microphone that transmits their voices into earphones I wear. The VTs hold small masks over their mouths to prevent their voices from distracting other students. Through the microphone they relay auditory information as well as visual information such as material written on the board, Law school relies heavily on class discussion and the Socratic method which made voice transliteration services absolutely crucial (Gima, 2014).

Obstacles encountered by D/HH students ranged from initial request for specific types of accommodations ignored such as a real-time captionist not provided until a student's senior year. Density of transcription notes were difficult to read and required a great deal of time to review. For D/HH individuals who were pioneers, institutions lacked resources. Students had to be very persistent and at least two students mentioned that either an advocate or parents had to remind educators about consequences of not meeting the needs of a student with a disability.

Nursing

After the evaluation was complete with the heterogeneous sample (N=28), further analysis took place with a focus only on nursing majors which represented a homogenous sample of seven. Participants were selected from the same pool of surveys (2), articles (2), videos (1) and meta-synthesis focus group interviews (2). Four participants were nursing students and three were nursing professionals. Several participants indicated that disclosure of hearing loss was one of the first steps exercised to work with patients and peers. D/HH nursing students and

professionals reported people tended to be receptive and understanding in the clinical setting. However, one communication barrier that arose centered on individuals who wore masks. Facial masks covered the mouth, therefore lip reading could not be applied. In the simulation lab, sometimes communication became difficult while students talk simultaneously.

Understanding the perception of risk associated with D/HH students enrolled in a nursing program is vivid to one nursing student, who was declined to work at a clinical site for a semester, due to reasons associated with liability costs (Boen, 2007). Even with acceptance at a clinical site, there was a high level of scrutiny by faculty to ensure the student performed at a high satisfaction level. Delivery of excellent quality patient care was essential. This was the case for a pregnant D/HH nursing student assigned to urgent care and emergency departments. She proved to instructors and her family that she was capable of overcoming hurdles after mastery of tasks (Zerbel, 2012).

Barriers: Communication and Resources

There were different challenges experienced due to students having various degrees of hearing loss. Several scenarios were discussed. To amplify words spoken by a professor with an accent, a microphone clip was worn by the professor. For some D/HH students, hearing aids were worn. In particular, one D/HH nursing student began wearing hearing aids after admission into nursing school. An interpreter was used in the clinical environment for one student; whereas, another student refused to use an interpreter, primarily because of ability to communicate orally. On the contrast, one D/HH student established a goal in nursing school to practice oral speaking to become more effective communicating with hearing individuals.

Answering telephones during the clinical experience was an area that one student wanted to avoid as expressed, "I also can't stand talking on the telephone, especially if it's someone with

a foreign accent. Another thing that is difficult is when there is a lot (of) noise going on, it becomes frustrating for me” (Anonymous Survey Participant, 2015). At times, lack of captioning videos became problematic in nursing classrooms, in addition to, not having access to podcasts. Partnering with a community agency, like The League for the Blind & Disabled, provided resources for one student to get special equipment needed for school.

Ergonomics and Technology

In the classroom, the use of ergonomics entailed special seating arrangements in the first row. Faculty positioned themselves to ensure the D/HH nursing student had clear view and understood concepts by speaking directly to the student whenever a question was posed. Special provision was also made in the simulation lab. One student mentioned, “Anytime I was walking or talking with my professors they always allowed me to walk on my better hearing side so I could hear them better” (Anonymous Survey Participant, 2015). In the classroom, a CART was useful for interpretation of vocabulary. Informing the patient and peers of disability early was another common theme.

An amplified stethoscope that intensified sound at the level 65 times the normal sound was one of the most beneficial types of technology mentioned. One nursing student actually conducted her own research to determine suitable instruments needed to accommodate her disability. Faculty allowed one participant extra time in the simulation lab to practice techniques used to identify heart and lung sounds. During clinical rounds, the scholar asked more questions pertaining to detection of heart and lung sounds. The nursing professional said, “I cried with tears when I heard my first “lub-dub” from my own heart. From that moment on, my heart was set; I was going to become a registered nurse” (Zerbel, 2012).

The academic chairman, of a nursing department carefully watched a D/HH nursing student to ensure assessment of patient's heart, lung and blood pressure were mastered. One of the main concerns of the chair related to the fact that certain accommodations offered in the classroom like an interpreter, would not be available in a clinical setting (Boen, 2007). Doubt of proficiency to perform professional nursing duties on-the-job still exists. One nursing professional embraces the challenge to educate people about "how they can help" (Focus Group 1). At times, patients will ask so many questions about nurse's hearing disability that soft skills must be used to refocus the visit on the patient.

Evaluation Techniques (Methods)

Four videos were created by post-secondary institutions, state government, and health organizations: Gallaudet University, University of California Davis Health Systems, North Carolina Dept. Health and Human Services and National Health Services, United Kingdom. One video was produced by the Edmonton Journal. Two videos were produced from TedX Talks, and Alexander Graham Bell Association. The remaining videos were created by individuals. Time duration of videos ranged from 1 minute 40 seconds to 16 minutes 36 seconds. Six videos were under 5 minutes. Videos were uploaded onto YouTube from the period of 2009 to 2014. Videos uploaded in 2009 were for 3 participants. Two videos were uploaded in each of the following years: 2010, 2013, 2014 and one in 2012. Primary data was obtained from two survey participants. Two articles were discovered while conducting a search for videos.

Video Methods

Several styles of video were used to convey information to the viewer about the Deaf and Hard-of-Hearing featured individual(s). One method most frequently (40%) observed centered on D/HH participant(s) exhibiting much effort, in certain cases to pronounce and speak words

audible to the viewer. The next format occurred in approximately 30% of videos where participants used mouth to pronounce words that were silent to viewer while simultaneously using sign language. Words were spoken by an interpreter. Sometimes the interpreter was shown in the setting and sometimes only the voice was heard.

Lifestyles of the participant were shown in the format described above. Highlights of on-the-job activity for a nurse were featured. Chronological events of a typical day for a D/HH student in class featured him tutoring other students along with discussions about social life. Sometimes captioning was shown with this second format.

The third style of video featured the participant speaking audible words while signing in response to questions that appeared sometime on a blank black screen without any voice.

CHAPTER 5 – CONCLUSION AND RECOMMENDATIONS

Disadvantages of Video: Data Source

Identification of technical terms and comprehension of language spoken by certain D/HH video participants presented challenges, initially. To paraphrase one participant's remarks who greatly relied on lip reading, an acquired skill set is needed to understand words lectured in class, even if accuracy is projected only at 25%. The transcriber also had to become familiar with the participant within the video environment. This required reviewing segments of the video tape numerous times, which exceeded expectations. Particularly, when technical terms and acronyms were used like *VETO*.

More than half of video participants, six of eleven, did not use an interpreter. Clarity of speech was not problematic for the majority of participants. In fact, without prior knowledge, one would not be able to differentiate speech of this group from persons without any form of hearing loss. New questions arose as to why there was such a difference in clearness of speech between two individuals who both had eighteen years of speech therapy lessons.

These points of interest associated with language are potential areas to consider for future study designs and possible collaboration with speech pathologists, audiologists, or linguistics professionals. Video issues identified for two participants, may not have been quite as labor intensive from an evaluator's viewpoint, if research team consisted of academic or clinical professionals knowledgeable about modifications of speech. Distinguishing between levels of hearing loss is another factor that may be beneficial for future exclusion criteria in a larger study design.

Transcription

Different schemes were initially attempted to transcribe words spoken by individuals featured or heard in the video that included: D/HH participant, interpreter, or moderator. One technique involved voice dictation. The process entailed speaking into a cell phone set up to send an email. This technique was not advantageous because the voice dictation feature stopped. Apparently, the system was designed not to exceed a certain word count. Therefore, budget allowances need to be made for voice dictation equipment or transcription services.

A prerequisite for video selection that became a standard involved listening to the entire video to determine if experience of participant provided adequate higher learning information. More details should have been recorded to track number of hours devoted to reviewing videos, especially, those not suited for the study. This metric is of value to compare which data source such as meta-synthesis focus group summaries or articles require the most investment in time during the preliminary process.

Transcribing medical terminology like the word *meningitis* required additional video analysis time. To decipher unclear words involved listening to words that preceded and followed terms in question. For example, to figure out the term *meningitis*, insight was gained from words used before the term as noted in the following statement, “I got a disease called *meningitis*. It’s actually a part of my brain. That is how I became deaf.” Other steps included conducting more research to determine if the *constructed-syllable* word transcribed could be defined and if the meaning related to hearing loss. This was the case for the term *VETO*, used to describe Video Relay Service.

The most beneficial...well I can tell you that general technology has helped the deaf and hard of hearing break through barriers. Just like in general, cell phones text people, email from our phone, but one of the most beneficial one is VETO phone that we can do, if we have with a VETO camera phone account with TV. You could see sign language with the person, people...we could sign or talk with them through VETO phone, that they would relay the message on to a

hearing person who I could talk to one deaf person to the next is one of the most beneficial technologies we have...(Student, 2010).

Unfortunately, the intensity of labor exercised in the transcription process does not provide reassurance for data quality. Member checking involves more than just solidifying accuracy of words stated; interpretation of meaning is a critical aspect. It is fair to say that if words transcribed are not accurate, then a ripple effect could occur with other interpretation and conclusions. Ultimately, this can lead to questioning credibility of the evaluator.

Verification to determine accuracy of word interpretation did not occur with D/HH participants. Communication with video participants was not an option since no relationship had been established with sponsoring agencies or individuals listed as video authors. Secondary video data contained minimum demographic information in contrast to meta-synthesis focus group data. Contacting participants would have only been feasible if this procedure was outlined in the IRB which it was not. An alternative method was considered.

Caption

As a backup system to assure words were interpreted correctly since no prior relationships existed between the principal investigator and D/HH video participants, another process was tested. Video-caption was recommended to the principal investigator after noticing the effort required to transcribe a video less than four minutes in length. The discovery of caption icons on certain YouTube videos was realized while transcribing the third video of ten total¹. Copying and pasting caption words from the video onto a word processing document became the standard of adoption for transcribing future videos.

¹ Note: There were 10 videos. One video contained two participants, so the total number of video participants was 11.

Language translated was derived from two instrument sources: video-caption and principal investigator's ears. To review accuracy, the entire transcript was read while simultaneously listening to the video again. At first, accuracy seemed very high related to consistency in words heard and words shown from video caption. It should be noted that a standard accuracy rate had not been developed to consider an acceptable rate of error. Nor had extensive literature review been conducted on the topic of caption

Upon further analysis, reoccurring issues began to surface. Major caption errors were detected; specifically, related to medical terminology and terms associated with culture. These results demonstrated a common thread with interpretation. Language that was initially very difficult for the principal investigator to understand and interpret, also resulted in transcription errors within video caption (Wald, Bell, Boulain, et al, 2007). Words used to describe the term *meningitis* were grossly mistranslated as observed in the dialog below with the video author and D/HH student:

Moderator:	First of all I like to ask Josh, how did you become deaf?
PI Interpretation:	I was two years old when I got meningitis. I got a disease called meningitis. It's actually a part of my brain. That is how I became deaf.
Video Caption:	out to use or way I Cup bennett don't. Ok I just seen Carmen 8.2 stock effective pumped by Boyd if that how it became got okay

Findings resulted in several implications. The first is that video caption does not substitute for member checking. It can serve as a supplemental tool to aid with transcription, but with caution.

Secondly, caption is a service often intended as a main source of information for members in the hearing impaired community. All entities that take initiatives to incorporate captioning into various mediums whether educational or entertainment purposes should be commended. However, excellence to improve technology must be the quality standard. If it is not, the window of opportunity has been lost; and information absorbed by deaf and hard of hearing is unprofitable. Recommendations to consider for videos featuring Deaf and Hard of Hearing include use of multiple communication tools. This might involve captioning plus sign language and if possible, speech. A similar approach was used by a D/HH participant who described three methods adopted to communicate with hearing people. For evaluators considering use of vendor transcription services that heavily rely on voice recognition to transcribe; questions should be posed to learn if indicators are incorporated to identify speech or words difficult to interpret which could result in inaccuracy.

Video Advantages

In the preceding section, the use of video primarily as an instrument is not recommended. However, for evaluation purposes, this form of medium is very effective in the area of observation. Additional insight about life experiences not previously considered as taxonomies became visible as videos were reviewed. For instance, the category of higher education was constructed after analyzing focus group summaries from a black and white perspective with no middle ground of gray. Experiences in the classroom, simulation laboratories, and clinical rotations were the model periphery.

Extra-curriculum activities were relevant simply from the viewpoint of obtaining more in-depth knowledge of the K-12 experience; a separate taxonomy established from focus group

summaries. Being able to see the chronological daily events experienced by an undergraduate student augmented the higher learning experience as described below:

I walk to school and I have three classes. The first is a broadcasting class. Then I have a history class and a sociology class. I have an hour break between each of those courses. Then the fourth one that I have is a work-study program where I go to an ASL class and help out with sign language or with tutoring student who might need tutoring...and once that's done, I take off and go home or go to my other job. I work at Grandover Resort, uh. It's a very ritzy hotel, and the job that I have is I take tickets for people that come in to eat. Well, at nighttime, I tend to go out with my hearing friends and go hang out and eat or go out to a club or just whatever...whatever for the evening and that's what I do after work (North Carolina Dept. Health and Human Services, 2010).

Non-professional work experience and social life did not seem relevant in the higher learning design model for this particular culture prior to video observation. It became relevant after noticing the number of tasks performed in a given day by one student. Reflection of comments by a deaf nurse described physical exertion as one of the effects from too much stimuli in various environments which resulted in heavy reliance on other senses. Breaks were needed to recharge (Herth, 1974).

Age could be a factor to consider whether post-secondary students with hearing loss require periods of isolation to re-energize. These outcomes could be of value to higher education advisors relative to scheduling classes, clinical sites, and laboratories. Career Services officers may need to reflect on facets of the work experience for D/HH students engaged in work study programs.

Overall, flow of meta-synthesis focus group data had a consistent flow with uniform information. Videos selected were not uniform in style nor content. One mutual shared benefit was having visual aids to identify individuals. A photo of the D/HH focus group participant was attached to the profile summary. Worries about confidentiality were minimum. Permission more than likely was gained by authors of the report to use image or likeness of 13 focus group participants. Types of information listed were actual names of participants, place of employment,

age, and institutions attended. One disadvantage of secondary data from meta-synthesis of focus groups was not knowing questions asked of participants. Assumptions were made about types of questions that may have been asked pertaining to demographic information. However, combination methods could have been used to obtain certain information from questionnaires then follow up focus group meetings.

Although most video participants' names were not used in the findings section, the concern of confidentiality breach was also not a major issue for videos created by reputable agencies, institutions, or actual participants. Caution is still advised for videos obtained from the internet. YouTube is primarily viewed as a venue for entertainment purposes. In one case, a video created by another individual featured a D/HH participant. Several weeks later while revisiting the link, a message indicated the video was no longer available and directed viewers to a different URL. The video appeared to have the same content. Now, the video author was the actual D/HH participant instead of another individual.

Recruitment: Snowball

Use of the snowball technique in social media proved to be advantageous. As noted earlier, the term snowball has different connotations dependent upon whether method referred to relates to literature research synthesis or opportunistic as defined by Miles, Huberman, and Saldana (2014). The latter definition became relevant for this study. Positive outcomes resulted in networking with establishments to collect primary data for recruitment.

Prior to commencement of research, there was no affiliation, or knowledge about professional organization websites used to disseminate information to Deaf and Hard of Hearing professionals. Certain networks were discovered as a result of entering a combination of terms

into search engine such as *Deaf nurses*, *Deaf Nurses Association*, and *Deaf health care* which generated a few listings of reputable agencies, articles, and several blogs worth exploring.

Web site agencies listed organization founders, board directors, and executives. Communication via email was method used for contact. Specific language approved by Internal Review Board (IRB) at Wayne State University had to appear in the body of the email. An introductory statement requested party to read message below and forward to anyone who might be interested in completing the survey. New opportunities were presented to recruit which had not been considered.

One agency executive offered an invitation to attend an upcoming conference where interviews could be conducted in-person, referred to as convenience sampling. Another founder offered an invitation to join the organization as a Facebook member to post content visible to approximately seven hundred members. These two prospects posed new risks because conference attendance to recruit participants was not mentioned in IRB application; neither was having the principal investigator post invitation on social media, as opposed to, the founder. Therefore, a call to IRB proposal reviewer occurred. The IRB response was split.

Attending a conference to recruit participants required proposal amendment. Any materials distributed at event needed IRB approval. Timing was another critical factor. There was no guarantee that IRB approval would be granted prior to conference dates. Conference attendance also required a fee. This recruitment method was not feasible.

Through email correspondence, the principal investigator explained reasons for declining offer to attend conference and asked again if the recruitment email could be forwarded to individuals who met criteria. No further corresponding emails were received by the executive. Another email was sent by principal investigator to a different officer listed as a contact on the

website. The email was forwarded to a board of director member who also sat on the Digital Strategy committee. An offer was extended to post survey information on the organization's Facebook account, in addition to, another private site that totaled a couple of hundred members.

This process was beneficial because members affiliated with an organization probably would trust a board member that posted information about the study, instead as oppose to unfamiliar principal investigator. Again, it was mandatory to use exact language approved by IRB. One observation that may have been a deterrence was noticed after the survey link became posted on a website. A partial glimpse of the informed consent form appeared with the title of the study, *Meta-synthesis of Sampling Methods Using Coding Strategies and Social Media for Deaf and Hard of Hearing Nursing Students*. These words might be appropriate in a journal publication, but not necessarily inviting to attract nursing students or alumni professionals. No IRB amendment was needed to post on social media, as long as content of email language approved by IRB remained unaltered.

Regarding the founder's invitation to post on the organization's Facebook page, the principal investigator had to establish a Facebook account in order to accept the founder's invitation. As the principal investigator awaited a response from the IRB, steps were taken to set-up a social media account. During the waiting process, principal investigator learned the organization founder posted the study to members as originally requested. Results of previously described efforts yielded less than five survey responses which is acceptable for a phenomenological study. To possibly improve results for future studies, more planning and strategic thinking with organization founders in the design stages is recommended. This suggestion must fall in the boundaries of institution policies. Points mentioned were not necessarily disadvantages of using snowball techniques, merely, lessons learned.

Control of sending out reminder notices from principal investigator to potential participants was somewhat limited since PI solely relied on professional courtesies extended by organization founder or agency representative for communication purposes. Prior to posting, a recommendation was given to the principal investigator to consider deleting contact email since the posting could possibly go all over the world based on domestic and foreign members. Since modification would violate university IRB language, no changes were made. One participant did forward an email to inform principal investigator survey was completed.

With a medium to large sample size, there may have been difficulty to detect names of survey respondents. However, with a very small sample size recruited through social media, this was not necessarily the case. One survey participant submitted a comment in response to the blog informing members about the survey. One participant posted in response to the social media blog that the survey was completed and expressed a desire to follow research findings. For a researcher, this news elicits an internal stimulus of excitement; to read that a member of the culture found value in the purpose of the study. Yet, participant's comments raised awareness about whether additional measures were needed concerning confidentiality. One recommendation is to include language in the *Research Information Sheet* that participant(s) will agree not to publically comment or blog about study participation.

Video Participant Recruitment

Some videos met the proposed criteria of five minutes in length or below. Yet, several videos did not have sound nor caption. Therefore, these types of videos were not chosen because of inability to interpret sign language. With this exemption, selection of videos was not easy. Of the remaining videos found, a limited number focused on higher learning or on-the-job

experiences of Deaf and Hard of Hearing. A recommendation is to include a sign language interpreter within the budget as a consultant.

The proposed criteria to select videos equal to or less than five minutes in length was not fully achieved. Only six of ten videos met the requirements. The remaining four videos were above five minutes. Finding videos materialized as a result of using a combination of words in the internet search engine which led to YouTube. Each day a new search began and the process repeated itself, not necessarily using the same descriptive words in sequence. In retrospect, this was a very important detail and to denote which search engine was used like *Google* or *MSN*.

Video recruitment of participants was the most time consuming. To improve this method, D/HH nursing students and professionals would be encouraged to create a video about higher learning and on-the-job experiences for research purposes under five minutes. Then, submit link or video file to principal investigator. This might decrease some of the risks about confidentiality issues noted in earlier sections.

The sampling plan most effective to recruit D/HH nursing participants for primary data collection was snowball. Numerous opportunities existed to build relationships with networks composed of professional healthcare members with special needs. Extreme sampling became an element of the research design almost by default. Deaf and Hard of Hearing students and/or alumni with majors in professional healthcare fields were atypical. Yet, a comparison study was conducted to examine shared experiences (Patton, 1987) between non-healthcare and healthcare majors in postsecondary institutions. Heterogeneous sampling was used. One shared theme that existed between a nursing student and a law student was the need to research specific accommodations to meet individualized needs.

Two survey nursing participants satisfied the requirement of conducting a phenomenological study using homogeneous sampling. During the video search process, newspaper articles were stumbled upon. Five additional perspectives from nurses provided a better understanding of knowledge pertaining to support systems, role models, accommodations, emotional barriers and overcoming communication challenges. New knowledge about the clinical experience in fast-paced settings like emergency and urgent care departments was gained.

A comparison of total word count from individual data sources was evaluated, see Table 5. Videos selected under five minutes had the lowest number of transcribed words followed by survey responses. Two samples were used from each data source. Rationale for sample size was based on total maximum number of surveys and articles obtained for each category. Differences existed in this smorgasbord approach. Variables included inconsistency of questions asked and total number. Raw transcript data was used for surveys, as opposed to summaries with meta-synthesis focus group data and non-journal articles. The medium of video and focus group summaries are difficult to classify as raw data because certain questions and responses could have been edited. This point reaffirms the viewpoint of Waite (2014) that qualitative researchers need to observe firsthand and not totally rely on the work of others.

There are an estimated twelve thousand deaf and hard of hearing nurses. This qualitative in-depth study of seven information rich informants greatly increases knowledge of x, y and z. Nevertheless, until formal networks are established to track this type of information about the learning experience, each episode of data continues to build the groundwork to better understand this subculture of approximately fifty thousand deaf and hard of hearing healthcare workers.

Table 5
Total Word Count from Each Type of Data Source

<u>Methods Used:</u>	<u>Word Count</u> (source code)	<u>Word Count</u> (source code)
Focus Groups Summaries	395 (FG12)	402 (FG13)
Survey Responses	711 (S1)	327 (SR2)
Articles	357 (A1)	701 (A2)
Videos less than 5 minutes	566 (V10)	228 (V8)
Videos greater than 5 minutes	1031 (V7)	851 (V6)

Note. Alphanumeric codes represent focus group (FG), survey (S) participants, articles (A) and videos (V). Length of videos: V10 = 4 minutes, V8 = 1 minute 40 seconds, V7= 8 minutes, V6= 14 minutes\

Multiple Coding Strategies: Gains and Losses

Evaluation of an extreme sample with unique characteristics can present challenges. In some cases, participants were the first deaf or hard of hearing student admitted to a specific program like nursing in the history of the institution. To link anonymous participants' responses with an educational institution can threaten risk of identity exposure. An effective strategy to report demographic and educational data while maintaining participant anonymity was to use grammatical methods in coding.

By using attribute codes, individualized data was transformed into broader categories. Carnegie classification, widely accepted by the academia community, was used to code post-secondary data. Numeric codes represented whether an institution was private, public, and/or high in research activity. Data showed that participants were not only admitted, but also graduated from some of the most prestigious institutions in the world. This systematic approach was replicated for other taxonomies like demographics. Bureau of Economic Analysis provided a system to categorize where participants were born and region attended for K-12 education. The process of utilizing attribute codes converted states into one of ten United States regions which included: New England, Midwest, Great Lakes, or Rocky Mountains. The master code list contained 23 categories and over 130 codes.

The investigative study contained mix-methods borrowed from qualitative and quantitative research. Multiple mediums of data beneficial for triangulation purposes utilized an array of codes. Numeric codes were transferrable onto spreadsheets. Results from initial analysis led to expansion of more categories. For instance, the demographic taxonomy evolved from the following fields: current age, age of hearing loss, location of birth/residence to categories derived from qualitative research training.

Almost near the end of the data analysis evaluation process, an ethnographic-observation discovery was made. Two additional demographic categories were available even though, data did not come from written or spoken sources. Information on gender and race/ethnicity was present because of photos from meta-synthesis focus group summaries and participant videos. Data on twenty-four of twenty-eight participants was available. Gender was easy to identify but race and ethnicity presented questions.

Observation is a key element in qualitative research methods. Other fields such as criminal justice and journalism also rely on this method. Yet, the level of confidence to determine if a participant could be classified as Hispanic or non-Hispanic, Black, or of multiple races resulted in uncertainty. This experience posed unanswered questions to whether there are certain boundaries or limitations to observation.

The question still becomes are there certain parameters in which investigation must be performed with multiple methods, if member checking is not feasible. In this particular case, a broad category was created: minority or non-minority. However, due to concern about this classification, data results did not place much emphasis on this variable. Certain classification of codes was used simultaneous like in-vivo and value codes. To understand a participant's perspective or belief, about a matter like inner traits needed to overcome obstacles in life, required coding exact language or in-vivo as a means to either interpret further or allow the content to remain raw without filtration by the evaluator.

To conclude, there are many different types of codes in qualitative research. The most effective tools involved coding line per line to build taxonomies which became the framework. Then finding appropriate codes to support initial taxonomies and continue until there are no more data fragments. The rigor of coding leads to ease in telling the story,

guided in form, by the research questions. Through in-vivo codes, the voice of the participant continued to stay audible which can be attributed to qualitative research. Transforming the data into quantitative research allows the voice or content spoken by a participant to become viewed with more of a microscopic lens to quantify many elements into a shape.

The final form is not necessarily complete. More in-depth studies with video from nursing simulation labs will enhance knowledge in addition to more interviews with clinical staff and faculty. Near-missed errors on-the-job need to be compared between deaf and hard of hearing nurses and their hearing peers. Nursing students mentioned notes taken in classroom are often dense. Further analysis using discourse analysis should occur to compare quality of notes. Transcripts should be reviewed to compare accuracy in words spoken by faculty and words actually transcribed or interpreted to the student. Content analysis search on higher education websites was not conducted as stated in the proposal. The aim was to determine if available resources were listed and easy to discover. This process is also recommended.

It would be beneficial to expand beyond beliefs reflected from student and alumni obtained in this study to other supporting members in healthcare, including peers and employers. Moreover, a limited selection of first and second coding techniques (i.e., grammatical, exploratory, thematic) were employed to understand the progress and career roadblocks of nurses diagnosed with severe to profound hearing loss. Based on the results of the study, it appears worthwhile to design and conduct a more comprehensive study using longitudinal, versus, and other coding schemes, along with different qualitative design approaches.

APPENDIX A -FIGURES

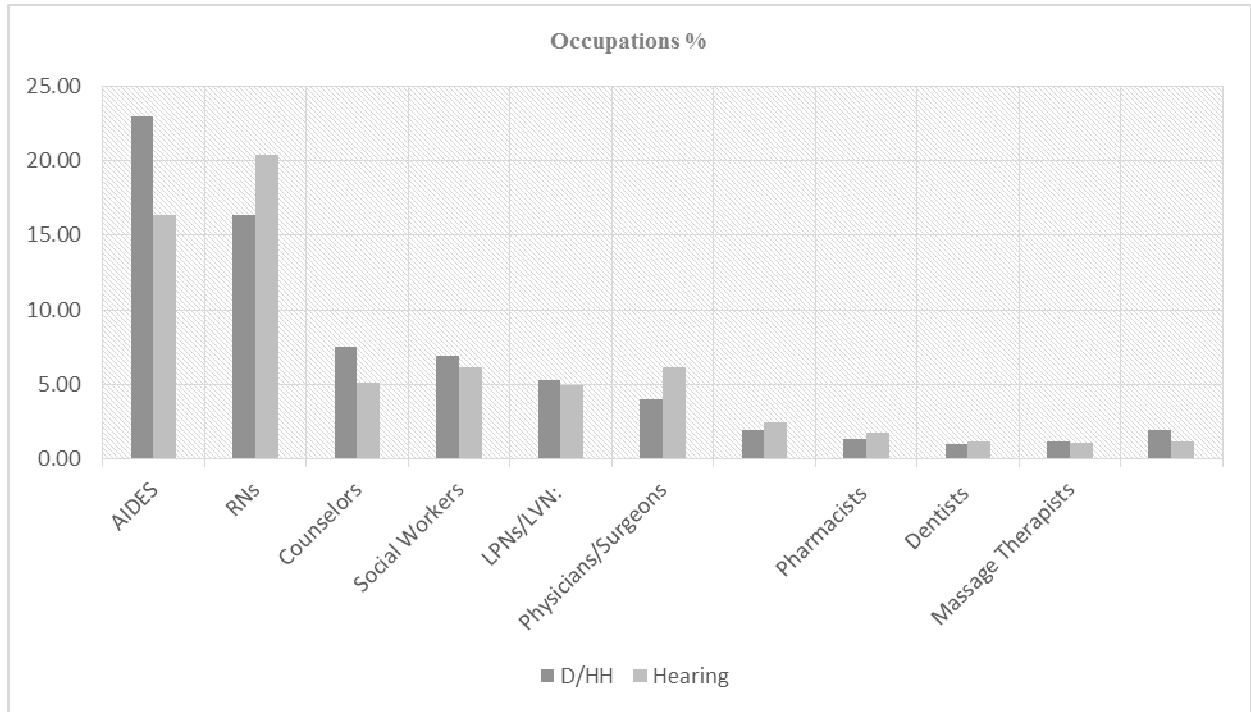


Chart 1: Percentage of Deaf and Hard of Hearing in Healthcare Occupations

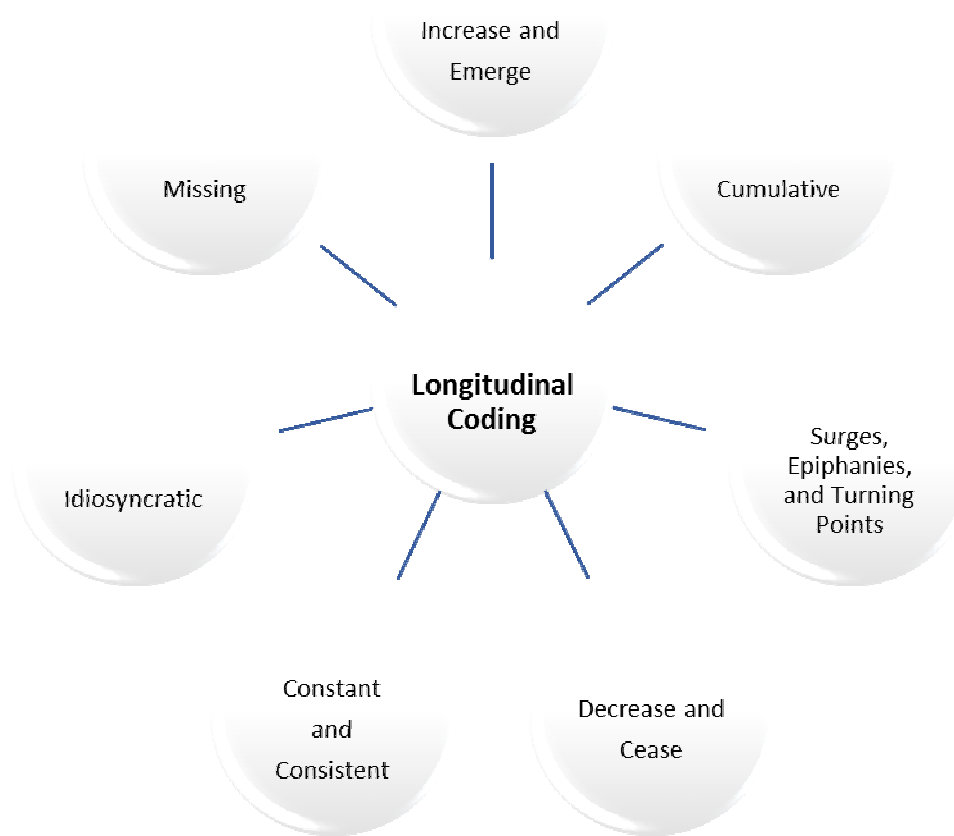


Figure 4: Longitudinal Coding, Saldana (2013)

Grammatical Codes	Attribute Coding Data and demographic elements Use: all studies
	Magnitude Coding Alphanumeric or symbolic codes and/ or subcodes Use: mixed methods quantitative studies
	Subcoding Second-order tag after primary code for additional detail Use: general codes require more labeling
	Simultaneous Coding Multiple coding Use: codes for data overlap

Figure 5: Grammatical Codes. Saldana (2013, p. 69 - 81) summarized four types of coding

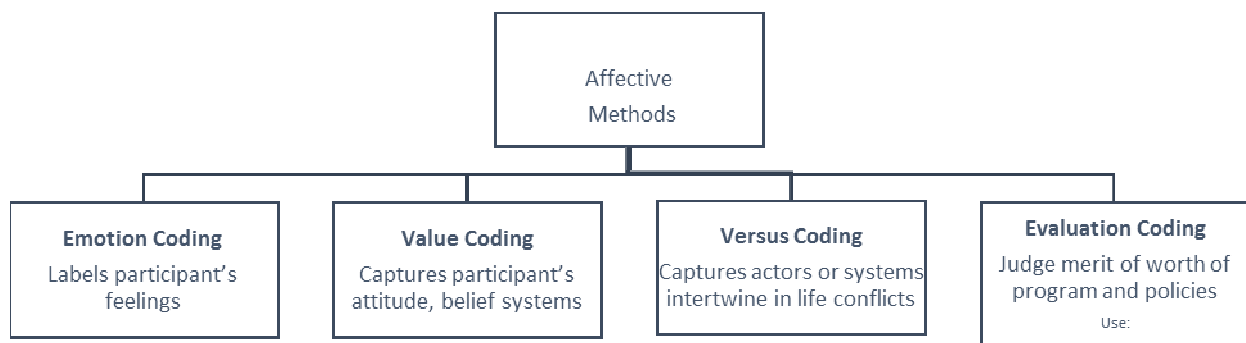


Figure 6: Affective Methods. Saldana (2013, p. 105-122) summarized four types of coding

APPENDIX B -RESEARCH INFORMATION SHEET

Title of Study: "Meta-Synthesis
Sampling Methods Using Coding Strategies and Social media for Deaf and Hard of Hearing
Nursing Students"

Principal Investigator (PI): Timberly Robinson
College of Education
313-452-3364
aj1417@wayne.edu

Purpose:

You are being asked to be in a research study to better understand the learning experience in higher education of individuals with a hearing disability who have entered or are preparing to enter the labor workforce because you are a nurse or nursing student and a member of the Deaf and Hard of Hearing community. This study is being conducted at Wayne State University.

Study Procedures:

If you take part in the study, you will be asked to complete a questionnaire with ten questions that require typing short and long-text responses. You have the option not to answer a particular question and continue with remaining questions then submit your responses. The time to complete the survey will vary per individual, but it probably will take approximately 20 to 60 minutes.

Benefits

As a participant in this research study, there will be no direct benefit for you; however, information from this study may benefit other people now or in the future.

Risks

There are no known risks at this time to participation in this study.

Costs

There will be no costs to you for participation in this research study.

Compensation

You will not be paid for taking part in this study.

Confidentiality:

You will be identified in the research records by a code name or number. There will be no list that links your identity with this code.

Voluntary Participation /Withdrawal:

Taking part in this study is voluntary. You are free to not answer any questions or withdraw at any time. Your decision will not change any present or future relationships with Wayne State University or its affiliates.

Questions:

If you have any questions about this study now or in the future, you may contact Timberly Robinson by email (aj1417@wayne.edu) or phone (313) 452-3364. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation:

By completing the questionnaire, you are agreeing to participate in this study. The data that you provide may be collected and used by Survey Monkey as per its privacy agreement. Additionally, participation in this research is for residents of the United States over the age of 18;

if you are not a resident of the United States and/or under the age of 18, please do not complete this survey.

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ABSTRACT

META-SYNTHESIS SAMPLING METHODS USING CODING STRATEGIES AND SOCIAL MEDIA FOR DEAF AND HARD OF HEARING NURSING STUDENTS

by

TIMBERLY ROBINSON

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Advisor: Dr. Shlomo Sawilowsky**Major:** Education Evaluation and Research**Degree:** Doctor of Education

In 2010, the birth of an aggressive strategy began to emerge aimed to increase the number of Deaf and Hard of Hearing (D/HH) individuals in professional healthcare fields. Employers and higher education admission officials desired more research. Data revealed that the field of nursing had a higher percentage of Deaf and Hard of Hearing professionals than other areas. Yet, there is a gap in the literature related to in-depth accounts about the learning experience and clinical training of D/HH nursing students. A phenomenological study was conducted to examine nursing experiences (homogenous sampling) compared to other clinical and non-clinical D/HH majors (heterogeneous sampling). The purpose was to explore higher learning and on-the-job experiences of 28 students and alumni within D/HH community. Primary and secondary data was generated from surveys (2), videos (11), meta-synthesis focus group summaries (13) and articles (2). Multiple coding strategies were used for data analysis in the mix-methods study.

Results: more than 50% (17 of 28) used the term *deaf* to describe hearing loss. Nearly 40% attended private undergraduate institutions. Facial mask was mentioned as a clinical

communication barrier and multiple students talking simultaneously in simulation lab. Financial costs of accommodations and denial of clinical sites due to employer's perceived liability risks were other barriers. The use of technology in classrooms, laboratories, and on-the-job is beneficial for Deaf and Hard of Hearing members. Errors noted in video caption pertaining to medical terminology. Need to improve timeliness of accommodations and perform quality check on notes and interpreting services.

Keywords: mix-methods, qualitative sampling, deaf and hard of hearing, nursing, meta-synthesis

AUTOBIOGRAPHICAL STATEMENT

Timberly Robinson attended Cass Technical High School located near downtown Detroit, Michigan where requirements for the chemical/biological curriculum were met to receive a high school diploma. In close proximity to the high school, post-secondary education was completed at Wayne State University and a Bachelor of Science degree in Biology was earned in six years and nine months. Shortly after graduating work began in the field of research. An opportunity was presented to work with scientists in the Department of Pediatrics, Clinical Pharmacology and Toxicology at Children's Hospital of Michigan. The work resulted in national journal publications. Post-bachelors courses were taken in the area of occupational and environmental health. Motivation came from concerns of attending such an old building in high school where ceiling damage was noticeable. Thoughts often occurred if there were potential risks to students.

Research and occupational training provided a good foundation for future employment in risk management and safety followed by five years of public health experience for the largest county health department in the State of Michigan. A graduate degree was later earned with a specialization in e-business. I later returned to Wayne State University and held research positions for four years in Molecular Medicine and Genetics, in addition to, providing services in support to the NIH Eunice Kennedy Shriver Perinatology Research Branch prior to becoming promoted as Associate Director in the College of Nursing. The most rewarding personal accomplishment has been serving the Deaf and Hard of Hearing community as a note taker for 10 plus years at my local church. One day, I will become a student of sign language.