Teachers Views of Assistive Technology for Disabled High School Students:

A Mixed Methods Study

Assessment and Evaluation 2199 EDTC 809

Kerry Magro

New Jersey City University

Fall, 2017

**Part One: Project Proposal Overview**

**Literature Review**

**Introduction**

This literature review outline examined assistive technology uses for disabled students. Several of the articles focused on the use of assistive technology among the visually impaired and blind community including a Texas study discussion of inclusion in the IEPs of Blind and visually impaired students. Connections to Universal Design and supporting student outcomes was also looked supporting 21st learning for disabled students in Rural Canada, and the decision making process in using technology in four Pennsylvania Schools A third category was assistive technology role in transition to college and career readiness, The deficiencies in the literature bring us to the more specific question that needs to be researched which is how do teachers believe their students benefit from the use of assistive technology, whether the teacher is sufficiently trained in its use to maximize the opportunity for the student and whether there is variation in the use of effectiveness across differing disabilities.

The audience for this study is teachers, administrators, parents and students. Understanding the benefits and opportunities assistive technology offers along with the need for additional training for teachers is a good step in guaranteeing a successful outcome for our students. Best Practices can be highlighted from successful outcomes.

Reflections of Teachers of Visually Impaired Students on their Assistive Technology Competencies (Ajuwon, Paul M.ET AL 2016) discussed this phenomenon. Two studies looked at (Zhou 2012 et al) first Texas teachers only and the second study looking at all 50 states. 57% of teachers exhibited a lack of confidence in instructing visually impaired students in use of assistive technology This report presented the qualitative results from the two studies

Assistive Technology in Special and the Universal Design for Learning, Alahdi, G, This Turkish study examines Universal Design for Learning should support all students (Wehmeyer 2006) work and role of teachers who have not been exposed to AT will not effectively use them with special education students. It cites (Burgstahler pp. 10-11) 8 technology advantages for students with disabilities Maximization of independence in academics, participate in classroom discussions gain access to peer mentors and role models, master academic tasks, gain access to educational options, participate more fully, succeed in work based experiences and secure higher levels of independent living cited in Inclusive Education in Rural Alberta, Canada: McGhie Richmond (2013) 230 teachers were interviewed in a constructivist paradigm used 13 case studies (5 high school) were used to enrich deeper understanding of survey results on inclusion as high school level role of assistive technology is accessed as well as teachers training to use the tools to promote inclusion.

A Teachers Knowledge and Use of Assistive Technology for Students with Special Educational Needs, Alkahtani K, 127 explored teacher’s participants in a survey of assistive technology skills and knowledge. It suggested teachers do not have the overall skills for implementing assistive technology and using universal design for learning for student with disabilities.

A Review of Community of Practice of teachers at Texas School of Blind and Visual Impairments outlined the legal basis, student basis and teacher basis for use of assistive technology to help blind and visually impaired students in a restricted environment.

*Transition to college and career: experience-based strategies to improve readiness of students with disabilities*. Varrassi, V. J. (2015). Varassi an M.A. uses 25 plus years of experience to develop a practical guide to using assistive technology for students as early as middle school thru high school and into college.

The Effectiveness of Video Tutorials for Teaching Pre-Service Educators to Use Assistive Technologies Van Laarhoven T et al, However, research has reported that lack of teacher expertise continues to be a significant barrier to effective access to AT and that models and strategies for improving teacher expertise are desperately needed.

Evaluation Study of Short Term Programs at a Residential School for Students Who are Blind or Visually Impaired, Porrund R, et al 2013. Residential schools looking for innovative ways to improve student outcomes In this survey of teachers and students both quantitative and qualitative data through 13 randomly selected participants who agreed to be interviews Students were also observed in 6 school settings The IRB Committee of Texas Tech approved the study. Assistive technology was examined as a tool for supporting educational opportunity.

The NJ Education Code, Chapter 14 provides a review of the NJ State Code including definitions of assistive technology and inclusion into students Individual with Educations Plans

A Qualitative Study of Assistive Technology Decision Making Process in Four Pennsylvania Schools, Tucker P, et al 2008. A Qualitative Study was conducted using a case study with triangulation of data services Personnel from four different schools volunteered to participate using semi structured interviews in response to federal legislation making Assistive technology available to all students with IEP’s.

**Theoretical Framework**

The Worldview for the study framework is a set of values that inform how we do the study (Creswell, 2015). This study uses the Social Justice worldview containing both Advocacy theory and Disability theory (Creswell 2015 p17). The results will try to level the playing field for educational opportunities for disabled students. The study uses a grounded theory in the sampling technique.

**Research problem**

The emphasis on 21st Century learning in New Jersey has included college readiness for High school students. For those with disabilities this transition is often more difficult and adequate preparation during their high school years becomes increasingly important. For many the technological advancements of assistive technology use in the curriculum can help level the playing field. College attendance is linked to future job employment. Examples of one category of disability show 80% of autistic adults are unemployed or underemployed (Autism Speaks, 2016)

In addition there is a growing trend of disabled students attending colleges despite their disability. Two New Jersey Colleges Rowan boasts a 6% disabled enrollment and Seton Hall 5% of their total enrollment. Familiarity with assistive technology and its role in these students’ curriculum can greatly assist in a successful college experience (Varassi 2015)

Reflections of Teachers of Visually Impaired Students on Their Assistive Technology Competencies indicates disability in categories broken down into autism, deaf-blindness, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disabilities, speech or language impairment, traumatic brain injury and visual impairment (Ajuwon, et al 2016).

Based on enrollment of students in schools in New Jersey from the ages of 6-21 there are 1,256,571 students while 207,010 of those students have a reported disability under the Individuals with Disabilities Education Act (IDEA) (CODE 2016). Potentially all of these students can benefit from assistive technology in their curriculum. Statistics show in the area of autism NJ exceeds the national enrollment 1.07 vs. .90 nationally. In visual impairments it is less .04 vs. .06 nationally. Graduation rates for all disabled students in NJ are .73 vs. .83 nationally in SY 2010-2011. Other indicators to note 27.6% autistic students are in special schools for handicapped vs. 8.2 nationwide and only 9.6 blind in separate facilities nationally while 90.4% attended public schools in NJ. Post school outcomes show for all disabilities 42.0 % are enrolled in higher education. Data Sources w[ww.ideadata.org./http??nces.ed.gov/ccd/elsi](http://www.ideadata.org./http??nces.ed.gov/ccd/elsi)

**Assistive technology**

A history of assistive technology Bryant (2012) indicates that they suggest three periods of this technology in the Foundation Period (prior to 1900), the Establishment Period and the Empowerment Period. They discuss how the first focus towards assistive technology was during the Stone Age when they tried to use as a stick as a cane to assist with a physical disability. Since assistive technology has evolved to an extent to go beyond physical disability to help those with learning disabilities as well. (Bryant et al.)

The United States Education Code 20 U.S.C. §1401(1) defines (1) Assistive technology device. (A) In general. The term "assistive technology device" means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability.

So how do teachers feel about Assistive technology? A Texas study indicated that a majority of teachers lack confidence in the usage of assistive technology to help benefit their students (Zhou, 2012). These research items show that the usage of assistive technology and the expertise of students and faculty in their knowledge depend on what type of technology is actually in each classroom.

NJ data breaks down impairments by disability. Autism is the highest percentage of disabled students; the other is the traditional impairment that has been accommodated since the 1900’s the blind and visually impaired.

These subgroups are looked at since one is a visual impairment; the other a language impairment. A study of high school teachers on the impact of assistive technology on these students can help determine successful best practices, ways of improvement of delivery to students and adequacy of preparation of teachers to deliver these services.

**The purpose**

Studies have indicated that of the 25% of all persons with autism those with nonverbal autism 40% of the time have average to above average intelligence. An example can be provided in Carly Fleischmann (2012), a nonverbal young woman on the autism spectrum who can communicate via an Ipad through a text to speech program. While presenting on the topic she indicates that “Just because you can’t speak doesn’t mean you don’t have something to say.” Autism Speaks Technology Kit emphasizes communication is a basic human right, communication should extend beyond conveying basic wants and needs, and individuals should be able to independently express all aspects of their personality. Although many reviews of literature have been conducted in this field there is still a gap in real world context. This study will address this by examining non-verbal disabled students programs in New Jersey. The purpose of the study is to examine teacher’s attitudes towards success of assistive technology in assisting their disabled students and their level of competencies in providing assistive technology.

**Research questions**

Creswell defines the central questions are broad questions that allow a central phenomenon to be addressed. In this study the use of AAC and its value to students is explored. The interview style will consist of closed and opened questions. The closed questions will be demographic in nature consisting of the background of the respondent. The open-ended interview focused on 3 central questions with a sub-question for each. The questions are listed below.

**Central Question 1:** How do teachers use AAC in the classroom to benefit nonverbal children with autism?

**Sub-Question:** How has PECS and/or IPads specifically impact your students?

**Central Question 2:** What is a key indicator for success for nonverbal children with autism in classrooms when it comes to AAC?

**Sub-Question**: What is something you think can be improved involving AAC in the classrooms?

**Central Question 3:** How will AAC benefit nonverbal children with autism?

**Sub-Question:** When assessing further research on AAC, what are some areas that need to be discussed?

**Central Question 1:** How do teachers use AAC in the classroom to benefit nonverbal children with autism?

**Sub-Question:** How has PECS and/or Ipads specifically impact your students?

**Central Question 2:** What is a key indicator for success for nonverbal children with autism in classrooms when it comes to AAC?

**Sub-Question**: What is something you think can be improved involving AAC in the classrooms?

**Central Question 3:** How will AAC benefit nonverbal children with autism?

**Sub-Question:** When assessing further research on AAC, what are some areas that need to be discussed? **Research questions**

**Description of questions:**

The questions will be asked in a survey format consisting of closed ended and open-ended questions:

Each of the respondents will be asked closed ended questions consisting of:

● Demographic information including Licensing and certification of SLC/teacher

● Amount of training on AAC devices

● The age range and disability of the students in your class

The qualitative questions are open-ended questions consisting of:

● How do teachers use AAC in the classroom to benefit nonverbal children with autism?

● How has PECS and/or IPads specifically impacted your students?

● What is a key indicator for success for nonverbal children with autism in classrooms when it comes to AAC?

● What is something you think can be improved involving AAC in the classrooms?

● How will AAC benefit nonverbal children with autism?

● When assessing further research on AAC, what are some areas that need to be discussed?

Do educators believe that high school students benefit from assistive technology in the classrooms?

**Research Sub-questions**

● Do educators of students’ with different disabilities believe high school benefit from assistive technology in the classroom?

● Do educators believe they are sufficiently trained to deliver optimum use of assistive technology for their students?

**Open-Ended Questions**

1. How would you define assistive technology?

2. How has assistive technology benefited your students the most?

3. How has assistive technology benefited your students the least?

4. Describe the relationships (if any) that were built between you and your students from the use of the assistive technologies.

5. Explain what assistive technologies were in place for your students already and what technologies you needed to ask to be brought in.

6. How were you trained on the use of assistive technologies?

7. Is there a need to include assistive technologies in the student's IEP?

8. Do you believe assistive technology has helped your students as they transition beyond school to postsecondary and career? Please explain.

**Methodology**

The study will employ a mixed methods approach. Both quantitative and qualitative methods will be employed. The quantitative portion of the study will be sent to School administrators of all ASAH schools. Research criteria established will sort the responses from schools that service autistic students or visually impaired students. A second sort value will be teachers of high school aged students. From this group a qualitative interview survey will be administered.Kvale defines qualitative research interviews as seeking to describe and the meanings of central themes in the life world of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say (1996). With these open ended questions we can figure out the participant’s experiences in greater detail than done through quantitative research interviews. We can develop themes and subthemes from the responses Since this survey relies on real life experience of AAC in the classroom setting it has no right or wrong answer which would lend itself to a quantitative study but rather captures the real life experience of the students and can be grounded in a disability philosophical framework where the results are designed at improving the lives of those with communication disorders.

**Research design**

The research design will be explanatory sequential design. The study will survey all ASAH schools in the first phase. The quantitative survey will take place first and a quantitative analysis will determine which schools meet the criteria of high school aged students and type of disability the researcher wants to examine, autism and visually impaired, The qualitative data collection will take place in the second phase and draw inferences as to the role of assistive technology for these high school age students. Interviews will take place the qualitative will follow the quantitative.

**Part Two: The instrument**

Interview questions

The researcher based on their experience with this issue developed the questions. . It will not set out to prove a theory but rather the theme will be developed in the course of the study through the use of open-ended questions and responses to understand the problem better. (Creswell 2014) The central question it seeks to understand more fully is has the use of assistive technology allowed disabled students to succeed in their academic programs. A secondary question is do educators believe that they have had enough training on assistive technology devices to meaningful impact their students. A disadvantage of this mixed methods approach so the qualitative method is a small sample size, which may be difficult to generalize to a larger population. After deciding on using mixed methods using quantitative and qualitative approach for the study the next step will be to decide on the approach to the study.

**Approach**

The approach for the study will use the worldview that Guba 1990, p, 17 in Creswell 2014 p250) defines as a basic set of beliefs that guide action. In this study the use of grounded theory as a qualitative strategy will be employed. This allows an abstract theory of an interaction grounded in the views of the teachers of the disabled students to emerge. (Creswell, p243)

This is a purposeful survey seeking participation from persons who are knowledgeable in the field. ASAH is a NJ non-profit that services 56 schools for special education of the handicapped. I keynoted at an ASAH Annual Conference in 2015. I intend to use that connection to enlist their assistance in helping me find appropriate schools for my survey.

ASAH will be approached to provide a listing of schools that service non-verbal students with autism - approximately half). Once that list is available an email will be sent to the school administrator requesting the Speech Language Specialist/teacher of the handicapped, in each of these schoolsrequesting their participation in the qualitative study. The speech language coordinator in NJ is a licensed advance teaching certification, and the SLC will be responsible for filling out the survey with the student’s teachers and returning them. It is anticipated that due to the current lack of research in a real world context, at the school level, and possibly the need for additional technology training in AAC the participants will welcome participating as a means to document the current state of the field and the results possibly be used to generate more funding for programs and training. An IRB will be needed to be approved prior to contacting any of the participants however a list of the schools servicing non-verbal autistic programs can be obtained from ASAH or their member websites directory that is currently online.

**Population and Sampling**

Following on the use of grounded theory for the qualitative study Creswell guidelines on sampling can be used for direction.

Purposeful selections of small group of teachers of the disabled allow the researcher to understand the phenomena of assistive technology role in disabled students. Creswell recommends 20 to 30 teacher participants for a grounded theory study (p.33)

This Grounded theory approach allows us to begin with the question of how assistive technology is used for teaching. The study will accomplish that by answering the research questions after the data is collected, coded it into themes and categories, analyzed and findings are presented. To get started the researcher must find subjects for the study.

The researcher will reach out to Association of School for the Handicapped in New Jersey (ASAH) to determine schools that teach disabled students and gather their contact information. A letter of introduction will be requested from ASAH, which is a member organization. The population of this study is high school teachers of the handicapped in New Jersey. Given the time available for the study only 20-30 New Jersey schools will be approached. Gaining access is a critical step in any research study it is hoped that by gaining ASAH’s assent to assist in the introduction of the study member schools will be more likely to cooperate than schools in New Jersey in general. After initial contact with the schools the first schools maximum 30 minimum 20 that respond will be included. After initial screening 10 teachers that meet some of the criteria for the purposeful study will be asked to participation the open ended survey. In no instance will the survey take more than an hour. Though this purposeful study will have a small sample size (10) compared to the number of teachers around the country the population of special students in the country the prevalence of some diagnoses may allow generalization to other states. Purposeful sampling (Piano & Creswell 2011) allows for those knowledgeable on the particular subject to be studied due to their familiarity with the study content. Purposeful criteria will be established to assess whether the teachers have any experience with assistive technology in the classroom for their students, their years of experience as teachers, specifically years of teaching disabled students, and their certification to teach disabled students which differs from general education certifications. Any specific training on the use and delivery of assistive technologies in their classrooms. General information on the size of the school, number of students, location and types of disability will be assessed. An attempt to have teachers from schools in urban, suburban and rural area of New Jersey will be made to reflect the New Jersey experience which may differ from other states around the country.

The final participants will be determined to meet a mix of the criteria above and will become the study group subjects. Schools that reply in the categories stated will be recruited. From the high schools for the disabled. Twenty to thirty participants who are currently high. school teachers of the disabled will be screened for the study with 10-20 as outlined above participating. After IRB permission is granted they will be provided with all required notification and permissions. A qualitative open-ended survey will be used to gather information central to the central phenomena. All contact with the teachers will be recorded and once the surveys are completed their will be coding of the qualitative data which will be organized into an SPPS file after it is determined who will be in the research study we can begin the IRB process here at NJCU. The steps will then follow with the survey, after it is analyzed for patterns and themes a second interview may be necessary to member check, validate or fill in any gaps in information.

**Description of study**

In an article on Assistive Technology (AT) Benefits for Students with Disabilities (1998) the Individuals with Disabilities Education Act (IDEA, 1997) is credited with bolstering (AT) use for students with disabilities. The article reports the federal definition of assistive technology is **“**any piece of equipment or product system whether acquired commercially off the shelf modified or customized that is used to increase maintain or improve the functional capabilities of children with disabilities.” In this study the impact on students of the use of Augmentative Alternative Communication (AAC) devices will be researched. Augmented Alternative Communication is used for students that are non-speaking or when natural speech is not meeting their communication needs. In these cases strategies augment their current communication, specifically text to speech programs and augmented alternative communication devices will be researched. Websites such as Autism Speaks have indicated that 1 in every 3 individuals who has autism is nonverbal today. With that, in recent years more and more schools have been embracing educational technology such as text to speech programs and picture to speech programs where sign language was the only alternative previously.

**Procedures \**

**After IRB approval a survey will be sent to 56 member ASAH schools (quantitative)**

**After responses are received a second survey will be sent to schools that meet the criteria autism, visually impaired and high school aged schools**

**A third open ended interview will be arranged from purposeful sample**

**A follow up interview ember checking will be conducted**

**Results will be analyzed and coded**

Research analysis will include computer aided coding to code the descriptions used to record data, developing themes, and interrelating themes. Two generally used software programs are MAXQDA or Nvivo. This phase of the study will consider Validity and Threats to validity: which may be the Small sample size to generalize across a larger population. As discussed

A second interview will involve member checking, validity and attempts at saturation which occurs when no more useful information is to be gathered. In this phase the Role of researcher will be disclosed that the researcher is disabled which may influence findings and identify any biases that may impact the findings.

The next step is the researcher will interpret findings write the report. He will distribute it to the audience, which are special education teachers, administrators, the disabled students and their parents and the study participants. The researcher will Consider ethical issues and preserve confidentiality. The final step will see the Study findings will recommend further study areas for consideration.

**Conclusion**

This mixed methods study can lead to research results that will aid to direct decision-making at high schools in terms of making assistive technology more accessible to the disabled population. Findings can be used to determine the best practices of assistive technology to visually impaired students who have been successful through the years and students with outer disabilities who have been exposed to assistive technology more recently and most importantly examine and record the attitudes of teachers of the handicapped about the successful integration of assistive technology into their curriculum and the required needs for teacher training.

**The Instrument**

Surveys - close ended and open ended will be used.

Link to survey on Qualtrics: [https://njcu.co1.qualtrics.com/jfe/form/SV\_0e6Ara7](https://njcu.co1.qualtrics.com/jfe/form/SV_0e6Ara78tFHkMId)

[8tFHkMId](https://njcu.co1.qualtrics.com/jfe/form/SV_0e6Ara78tFHkMId)

The survey can be accessed online following link copy attached in Appendix 1)

The interview questions (see appendix 2)

**Part Three: The IRB Application**

**Institutional Research Board (IRB)**

It is anticipated that it will exempt since it does not involve minors or a protected group

The sites will be NJ schools. The IRB process will:

Identify permissions needed, explain how the participants will be recruited, and identify the number of participant schools 20-30. It will explain all subjects will be NJ Teachers and state there are no known risks. All participants can withdraw at any time the participants will be told how they and their students will benefit from their participation. Any protocols will be mentioned. Participants’ permission will be obtained

Type of instrument used: Closed and Open ended Questionnaire

After surveys are completed they will be return anonymity will be preserved questionnaire will be secured.

**References**

Ajuwon, Paul M.; Meeks, Melanie Kalene; Griffin-Shirley, Nora; Okungu, Phoebe A. Reflections of Teachers of Visually Impaired Students on their Assistive Technology Competencies, Journal of Visual Impairment & Blindness, v110 n2 p128-134 Mar-Apr 2016.

Alkahtani K, Teachers Knowledge and Use of Assistive Technology for Students with Special Educational Needs, Journal of Studies in Education, 2013 Vol. 3, N0 Alahdi, G, Assistive Technology in Special and the Universal Design for Learning, The Turkish Online Journal of Educational Technology pp. 18-23

Assistive Technology Benefits for Students With Disabilities. (1998). *Journal of School Health,* *68*(3), 120-123. doi:10.1111/j.1746-1561.1998.tb03497.x

Bryant, Brian, et al. “Assistive Technology Solutions for Individuals with Learning Problems.” *Handbook of Research on Human Cognition and Assistive Technology*, pp. 264–285. 2012, doi:10.4018/978-1-61520-817-3.ch018.

Carly's Voice : Breaking Through Autism by Arthur Fleischmann (2012, Paperback). (n.d.). Retrieved November 12, 2017, from<https://www.ebay.com/p/Carlys-Voice-Breaking-Through-Autism-by-Arthur-Fleischmann-2012-Paperback/117352178>

Caruth, G. D. (2013). Demystifying Mixed Methods Research Design: A Review of the Literature. *Mevlana International Journal of Education,* *3*(2), 112-122.

Creswell, J. (11-14-2013). Steps in Conducting a Scholarly Mixed Methods Study, [Abstract]. *DBER Speaker Series,* *48*. Retrieved April 4, 2017, from<http://digatcommons.unl.edu/48>

Creswell J. W., & Plano Clark, V. L. (2010). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.doi:10.13054/mije.13.35.3.2

Creswell, J. (2013). In Knight V. (Ed.), Research design: Qualitative, quantitative, and mixed methods approaches. 1 Oliver’s Yard, 55 City Road London EC1Y: SAGE Publications.

Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Thousand Oaks, CA: SAGE.

Creswell, J. W. (2015). *Educational research: planning, conducting, and evaluating quantitative and qualitative research*. Boston: Pearson.

DeCuir-Gunby, J. T., & Schutz, P. A. (2017). *Developing a mixed methods proposal: a practical guide for beginning researchers*. Thousand Oaks: SAGE Publications,

Education in Rural Alberta, Canada: Journal of Education\

Ganz, J. B., Goodwyn, F. D., Boles, M. M., Hong, E. R., Rispoli, M. J., Lund, E. M., & Kite, E. (2013). Impacts of a PECS Instructional Coaching Intervention on Practitioners and Children with Autism. *Augmentative and Alternative Communication,* *29*(3), 210-221. doi:10.3109/07434618.2013.818058

Ganz, J. B., & Hong, E. R. (2014). Naturalistic Aided AAC Instruction. *Aided Augmentative Communication for Individuals with Autism Spectrum Disorders Autism and Child Psychopathology Series,* 55-75. doi:10.1007/978-1-4939-0814-1\_5

Ghie Richmond, Irvine, A, Loreman T, Juna L, Lupart, J, (2013) Teachers Perspectives on Inclusive

Individuals with Disability Act (IDEA) (1997). Horsham, PA: LRP Publications.Inc.\

Kroll, T., & Neri, M. (2009). Designs for Mixed Methods Research. *Mixed Methods Research for Nursing and Health Sciences,* 31-49.

Kvale, Interviews: An Introduction to Qualitative Research Interviewing Thousand Oaks: Sage Publications

Laarhoven, Toni Van, et al. “The Effectiveness of Video Tutorials for Teaching Pre service Educators to Use Assistive Technologies.” *Journal of Special Education Technology*, vol. 23, no. 4, 2008, pp. 31–45. doi:10.1177/016264340802300403.

Logan, K., Iacono, T., & Trembath, D. (2016). A systematic review of research into aided AAC to increase social-communication functions in children with autism spectrum disorder. *Augmentative and Alternative Communication,* *33*(1), 51-64. doi:10.1080/07434618.2016.1267795

Munk, D, Zurita L, Lynch K Smith T, Chandler, L, Data reported for IDEA 2011 Child Count and Census.<http://www.ideadata.org>

New Jersey State Code<http://www.state.nj.us/education/code/current/title6a/chap14.pdf>

Non verbal autism rates -<https://www.autismspeaks.org/science/science-news/researchers-focus-non-verbal-autism-high-risk-high-impact-meeting>

P G Chambers School (n.d.). Retrieved November 12, 2017, from [https://www.chambersschool.or](https://www.chambersschool.org)g

Pluye, P., & Hong, Q. N. (2014). Combining the Power of Stories and the Power of Numbers: Mixed Methods Research and Mixed Studies Reviews. *Annual Review of Public Health,* *35*(1), 29-45. doi:10.1146/annurev-publhealth-032013-182440

Technology Central. (2014, February 27). Retrieved November 12, 2017, from https://www.autismspeaks.org/family-services/technology

Tucker, P. Jones, S, Cappa M, A Qualitative Study of Assistive Technology Decision Making Process in Four Pennsylvania Schools, Tucker P, et al 2008, University of Connecticut, 2008

Van, Laar hoven T, Munk D., Zurita D, Lynch K, Smith F, Chandle Br , The Effectiveness of Video Tutorials for Teaching Preservice Educators to Use Assistive Technologies *Journal of Special Education Technology* Vol 23, Issue 4, pp. 31 – 45

Varassi, V. J. (2015). *Transition to college and career: experience-based strategies to improve readiness of students with disabilities*. Palm Beach Gardens, FL: LRP Publications.

**Appendix 1: Survey Questions: ASAH Schools Survey**

(All schools on list) Link to all ASAH Schools in NJ for Quantitative Schools Survey http://www.asah.org/asah-member-schools-alpha/

School Administrator - Quantitative

Each of the respondents will be asked closed ended questions consisting of:

● Demographic information including Licensing and certification of SLC/teacher

● Amount of training on AAC devices

● The age range and disability of the students in your class

As a member of ASAH what disabilities does your school handle?

* Visually Impaired
* Autism
* ADHD
* Deaf
* Behavioral
* Cognitive Delay
* Other

Q14

What are the ages of your students?

* Pre-K
* K-5
* Middle School
* High School
* Post-Secondary
* 18-21

Q11

How long have you been teaching in the New Jersey school system?

* Less than a year
* 1-3
* 4-6
* 7-9
* 10+

Q14

How long have you been teaching Special Education students in the New Jersey school system?

* Less than a year
* 1-3
* 4-6
* 7-9
* 10+

Q12

How old are you?

* Less than 21-years-old
* 21-29
* 30-39
* 40-49
* 50 or older

Q13

Have you received any certification in assistive technology or a related technology field?

* Yes
* No

Second Survey for Teachers Who Meet Criteria of Autism or Visually Impaired High School Teachers

Q1

1. How would you define assistive technology?

Q3

2. Is there an assistive technology that has benefited your students the most?

Q4

3. Is there an assistive technology that has benefited your students the least?

Q10

4. Describe the relationships (if any) that were built via you and your students from the use of the assistive technologies.

Q6

5. Explain what assistive technologies were in place for your students already and what technologies you needed to ask to be brought in.

Q7

6. How were you trained on the use of assistive technologies?

Q8

7. Is there a need to include assistive technologies in the student's IEP?

Q9

8. Do you believe assistive technology has helped your students as they transition beyond school to postsecondary and career? Please explain.

Import Questions From...

Create a New Question

Move Question

Add Note

Preview Question

Trash / Unused Questions (0 Questions) Empty Trash

1.As a member of ASAH what disabilities does your school handle?

Visually Impaired

Autism

ADHD

Deaf

Behavioral

Cognitive delay

Other

2.What are the ages of students?

Pre K

K-5

Middle School

High school

Post secondary

18-21

3.How many students do you service?

4.How many are high school age?

Post secondary?

5.Do you use assistive technology?

Thank you for participating in our survey

ASAH Purposeful Sample Survey of 20 Schools dealing with Autism or Visually Impaired

Start of Block: Default Question Block

Q6 How long have you been teaching in the New Jersey school system?

o Less than a year (1)

o 1-3 (2)

o 4-6 (3)

o 7-9 (4)

o 10+ (5)

Q14 How long have you been teaching Special Education students in the New Jersey school system?

o Less than a year (1)

o 1-3 (2)

o 4-6 (3)

o 7-9 (4)

o 10+ (5)

Q12 How old are you?

o Less than 21-years-old (1)

o 21-29 (2)

o 30-39 (3)

o 40-49 (4)

o 50 or older (5)

Q13 Have you received any certification in assistive technology or a related technology field?

o Yes (1)

o No (2)

Teachers - Qualitative

Q1 1. How would you define assistive technology?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q3 2. Is there an assistive technology that has benefited your students the most?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q4 3. Is there an assistive technology that has benefited your students the least?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q10 4. Describe the relationships (if any) that were built via you and your students from the use of the assistive technologies.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q6 5. Explain what assistive technologies were in place for your students already and what technologies you needed to ask to be brought in.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q7 6. How were you trained on the use of assistive technologies?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q8 7. Is there a need to include assistive technologies in the student's IEP?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q9 8. Do you believe assistive technology has helped your students as they transition beyond school to postsecondary and career? Please explain.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Thank you for participating in our survey

End of Block: Default Question Block

Appendix Two

List of schools Autism and School for the Blind

Allegro School. Cedar Knolls, NJ

Alpine Learning Group, Paramus, NJ

The Children’s Institute, Verona and Livingston, NJ

Deron School, Union and Montclair, NJ

Eden School, Princeton, NJ

Felician School for Exceptional Children, Lodi, NJ

Forum School, Waldwick, NJ

Garden Academy, West Orange, NJ

Gateway School, Carteret, NJ

Harbor School, Eatontown, NJ

Institute for Educational Achievement, New Milford, NJ

Phoenix Center, Nutley, NJ

Princeton Child Development Institute, Princeton, NJ

REED Academy, Oakland, NJ

SEARCH Day Program, Ocean, NJ

Somerset Hills Learning Institute, Bedminster, NJ

Windsor School, West Milford, NJ

YCS – Montclair, NJ

You and Me School, Edison, NJ

Visual Impaired

St. Joseph’s School for the Blind <http://schoolfortheblind.org/> 75 students

Appendix 2

● Do educators of students’ with different disabilities believe high school benefit from assistive technology in the classroom?

● Do educators believe they are sufficiently trained to deliver optimum use of assistive technology for their students?

*Interview Questions*

The questions will be asked in a survey format consisting of closed ended and open-ended questions:

How has PECS and/or IPads specifically impact your students?

What is a key indicator for success for nonverbal children with autism in classrooms when it comes to AAC?

What is something you think can be improved involving AAC in the classrooms?

How will AAC benefit nonverbal children with autism?

When assessing further research on AAC, what are some areas that need to be discussed.

How do teachers use AAC in the classroom to benefit nonverbal children with autism?

How has PECS and/or IPads specifically impact your students?

What is a key indicator for success for nonverbal children with autism in classrooms when it comes to AAC?

What is something you think can be improved involving AAC in the classrooms?

How will AAC benefit nonverbal children with autism?

When assessing further research on AAC, what are some areas that need to be discussed.

The qualitative questions are open ended questions consisting of:

● How do teachers use AAC in the classroom to benefit nonverbal children with autism?

● How has PECS and/or IPads specifically impacted your students?

● What is a key indicator for success for nonverbal children with autism in classrooms when it comes to AAC?

● What is something you think can be improved involving AAC in the classrooms?

● How will AAC benefit nonverbal children with autism?

● When assessing further research on AAC, what are some areas that need to be discussed.

Other questions as suggested by the instructor per his review of this proposal.

Do educators believe that high school students benefit from assistive technology in the classrooms?

**Open-Ended Questions**

1. How would you define assistive technology?

2. How has assistive technology benefited your students the most?

3. How has assistive technology benefited your students the least?

4. Describe the relationships (if any) that were built between you and your students from the use of the assistive technologies.

5. Explain what assistive technologies were in place for your students already and what technologies you needed to ask to be brought in.

6. How were you trained on the use of assistive technologies?

7. Is there a need to include assistive technologies in the student's IEP

8. Do you believe assistive technology has helped your students as they transition beyond school to postsecondary and career? Please explain.

**Appendix 3: IRB Application**

New Jersey City University File #

Institutional Review Board

1. Type of Review Requested : Expedited
2. Principal Investigator: Kerry Magro

Department: Educational Technology

Phone: 201-360-7819

Title of Research: Teachers View of Assistive Technology for Disabled High School Students

CO-INVESTIGATORS: None  
   
  
3. PURPOSE OF RESEARCH (Independent Project)

COURSE TITLE- EDTC 809 Assessments and Evaluation, Fall 2017,

Dr. Christopher Canaharan.  
  
  
  
  
4. IF YOU ARE A STUDENT RESEARCHER PLEASE PROVIDE THE FOLLOWING: MAILING ADDRESS: 1401 Hudson Street Hoboken NJ 07030  
   
  
TELEPHONE: 201-360-7819 EMAIL:kmagro@njcu.edu

FACULTY SPONSOR NAME: Dr. Christopher Canaharan.  
   
DEPARTMENT OF SPONSORING FACULTY: Educational Technology and Leadership  
  
EXT. FAX : EMAIL: ccanaharan@njcu.edu  
  
FACULTY SPONSOR SIGNATURE:   
  
DATE: 12/10/2017  
  
5. HAS THIS RESEARCH PROJECT BEEN CONSIDERED PREVIOUSLY BY THE IRB? YES NO x  
  
IF YES, GIVE LAST APPROVAL DATE:   
   
6. SOURCE OF FUNDING (IF APPLICABLE):   
  
UNIVERSITY GRANTS: PLEASE INDICATE WHICH GRANT PROGRAM: (FOUNDATION, SBR) N/A  
  
EXTRAMURAL FUNDS: PLEASE INDICATE AGENCY NAME:N/A   
  
TITLE:  
   
  
AWARD NUMBER: DATE :  
   
  
7. ARE YOU WORKING WITH A RESEARCHER FROM ANOTHER INSTITUTION? IF SO, BE AWARE THAT YOUR CO- INVESTIGATOR MUST ALSO SUBMIT YOUR JOINT PROPOSAL TO THE IRB AT THE INSTITUTION THAT EMPLOYEES HIM/HER.  
□ YES x ⁬ NO

8. WHAT IS THE OBJECTIVE OF THE RESEARCH?

The proposed study uses an exploratory sequential mixed methods study to examine teachers of disabled student’s views of assistive technology in high school students. To examine this issue more in depth two types of data will be collected involving surveys close and open ended and follow up interviews   
  
  
  
  
9. DOES YOUR RESEARCH INVOLVE ANY OF THE FOLLOWING (CHECK ALL THAT APPLY)? No  
  
□ MINORS  
□ PRISONERS  
□ PREGNANT WOMEN  
□ USE OF THE INVESTIGATORS’ CURRENT STUDENTS AS SUBJECTS  
□ DRUGS OR OTHER CONTROLLED SUBSTANCES  
□ PSYCHOLOGICAL OR PHYSIOLOGICAL STRESS ABOVE THE LEVEL OF NORMAL EVERYDAY ACTIVITIES  
□ MISLEADING OR DECEIVING SUBJECTS ABOUT ANY ASPECT OR PURPOSE OF THE RESEARCH  
□ COLLECTION OF INFORMATION WHICH DEALS WITH SENSITIVE ASPECTS OF THE PARTICIPANTS’ BEHAVIOR (ILLEGAL  
ACTIVITY, DRUG OR ALCOHOL USE, SEXUAL BEHAVIOR, ETC.)  
□ COLLECTION OF INFORMATION WHICH WOULD PLACE SUBJECTS AT RISK OF CRIMINAL OR CIVIL LIABILITY IF IT BECAME KNOWN  
□ COLLECTION OF INFORMATION WHICH COULD AFFECT SUBJECTS’ FINANCIAL STANDING, EMPLOYABILITY, OR REPUTATION  
□ EXAMINATION OF EXISTING DATA, RECORDS, DOCUMENTS, OR SPECIMENS THAT ARE NOT PART OF THE PUBLIC RECORD  
□ CHILDREN INVOLVED IN YOUR RESEARCH WITHOUT SENSITIVE INFORMATION ABOUT THEMSELVES OR THEIR FAMILIES.  
□ COLLECTING OR STUDYING EXISTING DATA, DOCUMENTS, RECORDS, PATHOLOGICAL SPECIMENS OR DIAGNOSTIC SPECIMENS WHICH ARE PUBLICLY AVAILABLE AND FROM WHICH PARTICIPANTS CANNOT BE IDENTIFIED BY ANYONE OTHER THAN THE INVESTIGATOR(S).  
  
IF ANY OF THE ABOVE ITEMS ARE CHECKED  
YOUR PROPOSAL DOES NOT QUALIFY FOR AN EXEMPT REVIEW  
  
10. DESCRIBE THE DESIGN OF THE RESEARCH INCLUDING WHAT WILL BE REQUIRED OF SUBJECTS (ATTACH ADDITIONAL SHEET IF NECESSARY):   
  
Explanatory sequential design using mixed methods, quantitative and then determining qualitative open ended surveys with follow up interviews  
  
  
   
11. UNDER WHICH OF THE FOLLOWING CATEGORIES ARE YOU APPLYING FOR EXEMPTION?  
  
X 1. RESEARCH CONDUCTED IN ESTABLISHED OR COMMONLY ACCEPTED EDUCATIONAL SETTINGS, INVOLVING NORMAL EDUCATIONAL PRACTICES, SUCH AS (I) RESEARCH ON REGULAR AND SPECIAL EDUCATION INSTRUCTIONAL STRATEGIES, OR (II) RESEARCH ON THE EFFECTIVENESS OF THE COMPARISON AMONG INSTRUCTIONAL TECHNIQUES, CURRICULA, OR CLASSROOM MANAGEMENT METHODS.  
  
□ 2. RESEARCH INVOLVING THE USE OF SOCIAL SCIENCE OR EDUCATIONAL TESTS (COGNITIVE, DIAGNOSTIC, APTITUDE, ACHIEVEMENT),SURVEY PROCEDURES, INTERVIEW PROCEDURES, OR OBSERVATION OF PUBLIC BEHAVIOR UNLESS (I) INFORMATION IS OBTAINED IN SUCH AWAY AS THAT THE PARTICIPANTS CAN BE IDENTIFIED DIRECTLY OR INDIRECTLY OR (II) THE PARTICIPANTS’ RESPONSES, IF THEY BECAME KNOWN, COULD PLACE THE PARTICIPANT AT RISK OF CRIMINAL OR CIVIL LIABILITY OR BE DAMAGING TO THE PARTICIPANTS’ FINANCIAL STANDING, REPUTATION, OR EMPLOYABILITY. (ALL RESEARCH  
INVOLVING SURVEY AND INTERVIEW PROCEDURES IS EXEMPT WHEN THE PARTICIPANTS ARE ELECTED OR APPOINTED PUBLIC OFFICIALS OR CANDIDATES FOR PUBLIC OFFICE. HOWEVER, CONFIDENTIALITY MUST BE MAINTAINED WHEN REQUIRED BY FEDERAL STATUTE.)  
□ 3. RESEARCH INVOLVING THE COLLECTION OR STUDY OF EXISTING DATA, DOCUMENTS, RECORDS, PATHOLOGICAL SPECIMENS, OR DIAGNOSTIC SPECIMENS, IF THESE SOURCES ARE PUBLICLY AVAILABLE OR IF THE INFORMATION IS RECORDED BY THE INVESTIGATOR IN SUCH A MANNER THAT PARTICIPANTS CANNOT BE IDENTIFIED.  
  
□ 4. RESEARCH AND DEMONSTRATION PROJECTS WHICH ARE FUNDED BY A FEDERAL AGENCY AND DETERMINED TO BE EXEMPT BY THE AGENCY HEAD AND WHICH ARE DESIGNED TO STUDY, EVALUATE, OR OTHERWISE EXAMINE: (A) PUBLIC BENEFIT OR SERVICE PROGRAMS; (II) PROCEDURES FOR OBTAINING BENEFITS OR SERVICES UNDER THOSE PROGRAMS; (III) POSSIBLE CHANGES IN OR ALTERNATIVES TO THOSE PROGRAMS OR PROCEDURES; OR (IV) POSSIBLE CHANGES IN METHODS OR LEVELS OF PAYMENT FOR BENEFITS OR SERVICES UNDER THOSE PROGRAMS.  
□ 5. EXEMPTION FOR COLLECTION OR STUDY OF EXISTING DATA: RESEARCH INVOLVING COLLECTION OR STUDY OF EXISTING DATA, DOCUMENTS, RECORDS, IF THESE DATA ARE NON-IDENTIFIABLE AND PUBLICLY AVAILABLE OR INFORMATION IS RECORDED BY THE INVESTIGATOR IN SUCH A MANNER THAT SUBJECTS CANNOT BE IDENTIFIED DIRECTLY THROUGH IDENTIFIERS LINKED TO THE SUBJECT (CODES LINKING NAMES TO DATA ARE CONSIDERED INDIRECT IDENTIFIERS).  
  
□ 6. EXEMPTION FOR STUDY OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES: UNLESS SPECIFICALLY REQUIRED BY THE STATUTE, RESEARCH AND DEMONSTRATION PROJECTS WHICH ARE CONDUCTED BY OR SUBJECT TO THE APPROVAL OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES, AND WHICH ARE DESIGNED TO STUDY, EVALUATE, OR OTHERWISE EXAMINE:  
  
(A) PROGRAMS UNDER THE SOCIAL SECURITY ACT OR OTHER PUBLIC BENEFIT OR SERVICE PROGRAMS  
(B) PROCEDURES FOR OBTAINING BENEFITS OR SERVICES UNDER THOSE PROGRAMS  
(C) POSSIBLE CHANGES IN OR ALTERNATIVES TO THOSE PROGRAMS OR PROCEDURES  
(D) POSSIBLE CHANGES IN METHODS OR LEVELS OF PAYMENT FOR BENEFITS OR SERVICES UNDER THOSE PROGRAMS.  
  
  
IF YOUR RESEARCH IS GIVEN EXEMPTION STATUS, THE FOLLOWING MUST BE STATED ON A COVER LETTER ACCOMPANYING ANY SURVEY OR QUESTIONNAIRES.  
  
1. A STATEMENT THAT ALL PARTICIPATION IS VOLUNTARY  
2. A STATEMENT THAT YOU ARE CONDUCTING RESEARCH AND THE REASON FOR IT (MASTER’S THESIS, PUBLICATION, ETC.)  
3. PURPOSE OF THE RESEARCH - WHAT YOU ARE INVESTIGATING  
4. A STATEMENT THAT ALL RESPONSES WILL BE KEPT ANONYMOUS AND CONFIDENTIAL  
5. A STATEMENT THAT PARTICIPANTS NEED NOT RESPOND TO ALL QUESTIONS  
6. IF PARTICIPANTS ARE YOUR OWN STUDENTS, A STATEMENT THAT CLASS STANDING WILL NOT BE AFFECTED IN ANY WAY BASED ON PARTICIPATION  
7. AHE NAME AND TELEPHONE NUMBER OF THE PRINCIPAL INVESTIGATOR (PI) AND FACULTY SPONSOR (IF APPLICABLE)  
  
  
   
ALL IRB APPLICANTS MUST COMPLETE QUESTIONS 12 – 18  
  
12. DESCRIBE THE SUBJECTS WHO WILL BE PARTICIPATING (NUMBER,

AGE, GENDER, ETC.)

56 surveys of adult administrators/teachers of disabled member schools or Association of Schools for the handicapped in New Jersey will be screened for what diagnosis their school students have and age of students.

Schools that have students high school and postsecondary with diagnosis of autism or visually impaired will receive a second survey to be filled out by teachers in these schools Follow up interviews will be done with approximately 20 teachers of the handicapped one from each school that meets the criteria

All participants will be adults over 18  
  
13. HOW WILL SUBJECTS BE RECRUITED? IF STUDENTS, WILL THEY BE SOLICITED FROM CLASS?  
Administrator will be selected from each school from the ASAH list of member schools

Approximately 20 schools will meet the criteria and individual administrator will solicit participation form their teachers at end of survey participants will be asked to participate in follow up interview  
  
14. WHAT RISKS TO SUBJECTS (PHYSIOLOGICAL AND/OR PSYCHOLOGICAL) ARE INVOLVED IN THE RESEARCH?  
  
No risks are anticipated in participating in this study  
  
15. IS DECEPTION INVOLVED IN THE RESEARCH? IF SO, WHAT IS IT AND WHY WILL IT BE USED?  
No deception is involved in this study   
  
  
  
16. WHAT INFORMATION WILL BE GIVEN TO THE SUBJECTS AFTER THEIR PARTICIPATION? IF DECEPTION IS USED, IT MUST BE DISCLOSED AFTER PARTICIPATION.  
  
Participants will be given a copy of the study results

17. HOW WILL CONFIDENTIALITY BE MAINTAINED? WHO WILL KNOW THE IDENTITY OF THE SUBJECTS? IF A PRE AND POST TEST DESIGN IS USED HOW WILL THE SUBJECTS BE IDENTIFIED?  
  
All survey response will be coded by number and all identifying information will be removed from any transcripts paper or audio recorded the researcher will be the only one who will know the identities of the responses and is bound by confidentiality  
  
  
18. HOW WILL THE DATA BE RECORDED AND STORED? WHO WILL HAVE ACCESS TO THE DATA? WHERE WILL IT BE STORED? ALL DATA MUST BE KEPT FOR A MINIMUM OF THREE YEARS.  
  
Data will be maintained and stored for a period of three years at an NJCU approved computer facility. All computer access will be password protected