A Quantitative and Qualitative Assessment of the Experiences of Deaf and Hard-of-Hearing Students Transitioning into Baccalaureate Studies in STEM Disciplines

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Abstract

This project aims to understand the transition that students who are completing the Laboratory Science Technology (LST) program at the National Technical Institute for the Deaf (NTID) experience as they matriculate into STEM baccalaureate coursework. Assessment of student participants is multifaceted, including qualitative and quantitative data. Student responses to the Grasha-Riechmann Student Learning Styles Scales (GRSLSS) survey are compared with their performance in General Biology courses. These findings are further elucidated through a review of student mentor-mentee program journal writings.

Introduction and Methods

We have been investigating the factors that impact the academic performance of students who are undergoing this transition by using quantitative and qualitative methods to assess these students’ attitudes during their transition year for comparison with other students who are deaf, hard-of-hearing, and hearing. We paired students with student mentors who themselves have made the same or similar transitions in order to understand the situation from both perspectives.

To assess our target student group, from 2012 to present we have been collecting and analyzing data on the academic and personal factors that have been identified as potential pitfalls. Our quantitative data includes responses by deaf, hard-of-hearing, and hearing students to the GRSLSS survey in which student attitudes in six general areas that constitute three related pairs of characteristics:

- Independence vs. Dependence
- Collaboration vs. Collaboration
- Dependence vs. Collaboration
- Participation vs. Competitiveness

We then correlated students’ survey data with their grades in COS STEM courses to identify performance-attitude trends among these populations of students.

We have also collected qualitative data on these same learning attitudes through the assignment of weekly journal writing topics assigned to the mentors and mentees. Student responses related to independence and dependence are presented here.

Data - Grasha-Riechmann Student Learning Style Scales (GRSLSS) Survey Results

![Figure 1. Correlation of three-quarter General Biology GPAs with ratings of independence as determined from the GRSLSS survey. The more independent all students respond on the GRSLSS survey, the better their grades are in these courses.](image)

Data - Mentor Journal Writings

Mentors’ Perceptions of Independent and Dependent Learning

“Independent learner is someone who makes sense of the world based on his or her own observations and experiences rather than depending on the words of others. It also means being able to trust your own abilities to make your own judgments. An independent thinker is someone who is a critical thinker, they [consider] all possibilities and come up with multiple solutions.”

“An independent learner is somebody who would ask questions if he/she needs clarification on something learned in class. He/She would then apply information learned during class on homework, projects, etc. and make an attempt to put everything together … Also, taking advantage of the availability of tutors and office hours is an important characteristic of an independent learner. Basically they are able to do things on their own and ask for guidance whenever they need it.”

“There is a spectrum between dependent and independent learning. No one is truly dependent or truly independent. I consider myself to be somewhat an independent learner. When I am in class, I become dependent, because I am just there to listen and absorb what the teacher has to say. I rarely ask questions, a trait of independent learning … While I do not ask that much questions in class, I do ask myself many questions. Inquisitiveness is the soul of independent learning.”

Data - Mentee Journal Writings

Mentees’ Perceptions of Independent and Dependent Learning

“Independent learner is when students do the learning by themselves and don’t tend to get some help with their learning. They will find anything that will help them get through the classes without asking anyone for help. The notes, lectures and more whatever students use to help them to get through the classes.”

“In LST, we depended on teachers to inform us what will be in the test or when homework is due. We also depend on them for their additional time to teach us things that we do not understand in class. However, in College of Science, we are on our own on everything and it is our responsibility for understanding the expectations needed to pass the course.”

“It is important to be an independent learner without relying on others because I believe one can learn so much not only for their education benefit but also for their lives in the real world after college.”

Conclusions

- Our mentees have a relatively simple view of independent learning: being independent means not relying on other people.
- Our mentors have a more nuanced view of the nature of independent learning: being independent also means knowing when to be dependent.
- Our mentees who perform best in General Biology rate as both independent and dependent. These are the students who already understand the dual nature of independent and dependent learning. These students take advantage of faculty tutors when needed and, in general, use dependence to their advantage.
- The concepts of independence and dependence likely have different connotations between our various populations of students and even between specific groups of deaf and hard-of-hearing students.

Acknowledgments

We thank the NTID Research Center for Teaching and Learning (ROTL) for funding this work, Susan Foster for helpful discussions and analysis of our qualitative data, and Richard Dimpster for assistance in collecting grade data.

Presented at the Second Annual Conference of the Assessment Network of New York (ANNY) at Rochester Institute of Technology on April 28, 2014.