Student outcomes assessment: NTID's business careers department

Kathleen Garlinghouse

Follow this and additional works at: http://scholarworks.rit.edu/theses

Recommended Citation
STUDENT OUTCOMES ASSESSMENT:  
NTID's Business Careers Department

Master's Project

Submitted to the Faculty
of the Master of Science Program in Secondary Education
of Students who are Deaf or Hard of Hearing

National Technical Institute for the Deaf
ROCHESTER INSTITUTE OF TECHNOLOGY

By
Kathleen S. Garlinghouse

In Partial Fulfillment of the Requirements
For the Degree of Master of Science

Rochester, New York May 25, 2001

Approved: ____________________________

(Project Advisor)

_______________________________
(Second Project Advisor)

_______________________________
(Program Director)
STUDENT OUTCOMES ASSESSMENT:
NTID's Business Careers Department
by Kathleen S. Garlinghouse

1. The need for the project (What is the severity of the problem or magnitude of the need for the services (local/national):

Students graduate from college with a variety of general and specific skills. However, most colleges would have a difficult time “describing” to potential employers the specific skills and work related attitudes that their graduates possess. During the last few decades, interest has grown in what is called “Student Outcomes Assessment.” This term has come to mean the activities undertaken by a college to identify and measure academic and job related skills that the college feels most, if not all, of the graduates of the college (or program within the college) possess by the time they graduate. I am interested in what is being written in the literature related to identification and measurement of skills of business school graduates and what kind of skills companies would like to see from business school students and how business programs can test students to determine if they possess those skills. Based upon these interests, I have decided to collaborate with the National Technical Institute for the Deaf’s Business Careers Department, Administrative Support Technology (AST) Program, to assess its business students’ skills using the skill areas defined in Microsoft Office User Specialist Program (MOUS), which was considered by the MASIE Center (an international thinktank focused on learning and technology), as an important evolutionary step in the world’s adoption of computers in the workplace. As the computer becomes an accepted and integrated tool of every office, the focus is shifting to workforce technical competency (The MASIE Center, 1998). I am also seeing the need for graduating business students to have certification when they apply for jobs. The MASIE Center’s study of Microsoft’s new program highlights an enormous demand for skill certification and a workforce marketplace eager for global desktop performance standards by stating:
• Employers want to know that temporary or new hires can work in a computerized environment.

• Employees want to know what skills they can take into the job market.

• Schools want to graduate students with valuable core computer skills.

• Buyers of training services want to know if their investment translated into usable skills.

• Computer support staff want to know the skill level of a user calling a help desk. (The MASIE Center, 1998).

Also, from the Microsoft Office User Specialist Program newsletter, individuals and organizations alike stand to benefit from MOUS certification, which offers:

• Individuals a credential to demonstrate their knowledge of the world's most recognized and utilized suite of business applications, as well as many important business concepts;

• Corporations a method for recruiting employees with the most current desktop skills, thereby elevating productivity;

• Academic institutions an outline for desktop education;

• IT training organizations a global standard for validating training outcomes;

• Personnel organizations a credential for successful placement. (The MOUS Newsletter, 2000).

Nearly 80,000 people worldwide have taken the Microsoft Office User Specialist (MOUS) to get certified through corporations, academic institutions, training centers and career centers—including 1,050 who have achieved the Master level on Microsoft Office 97 (PR Newswire Association, Inc., 1999). Approximately 80 certification programs now test technical competency in areas such as networking, databases, enterprise resource planning (ERP), specific software packages, project management, and the Web. Certification is available both from vendors and from industry trade organizations, such as the Institute for Certification of Computing Professionals, in Des Plaines, Ill., and the Newtown Square, Pa.-based Project Management Institute (Jacobs, 1998).
The Microsoft Office User Specialist Program is the only comprehensive productivity program designed to validate desktop computer skills using Microsoft Office applications. MOUS proves computer literacy, measures proficiency and productivity and identifies opportunities for skills enhancement. "These testing milestones show how end-users and companies in need of skilled workers see the value in MOUS," said Keith McFarland, Nivo International chief executive officer. "Being MOUS certified provides individuals with the proof that they have the desktop-computing skills necessary to work more productively and efficiently." (PR Newswire Association, Inc., 1999).

"Interest in IT industry certification is at an all-time high, with a record increase of more than 50 percent in the first quarter of this year alone," Steve Hoffman of Sylvan Prometric company, said. "Microsoft's research indicates that Microsoft Office is currently used at 90 percent of Fortune 500 companies, as well as by smaller businesses, organizations, associations, and government agencies. Also, according to Marketshare's Mark A. Jones, "when certification is used to evaluate new hires, the guesswork is taken out of the equation, providing hiring managers with the ability to assess employees against a standardized level of skills. Beyond providing a standard measure for hiring," he said, "certification serves as an assessment tool for employers, providing them assurance that the company is getting a return on their training investment by verifying that training has resulted in employee proficiency. (Kaminer, 1998.)

Based upon the above literature, I am interested in working with the NTID Business Careers Department AST program to evaluate the results of using the DDC Publishing practice tests, one of the certification preparation software packages approved by the Microsoft Corporation. This assessment tool is specifically designed to measure the level of students' skills in using Microsoft Office software. This practice test measures students' understanding of directions and their ability to accomplish tasks required of them, and helps them evaluate their skills in order to
enhance their job marketability upon graduation. Deaf students have to be competitive with hearing students and to prove their skills in order to have the "edge" in the working world.

2) The significance of the project: (Does this project lead to an increased understanding of educational problems? Does the project demonstrate new strategies or build on existing strategies? What is the replicability of the proposed project?)

Deaf students' problems associated with reading and comprehension of test items could have an impact on the DDC practice test and later the MOUS test results or outcomes. Carol LaSasso's study on "deaf students' test taking skills showed that various standardized reading tests administered over the past 80 years to deaf students of different ages, consistently indicate that these students' level of reading achievement is significantly below that of their hearing peers (LaSasso, 1999, citing Allen, 1986; Gentile, 1972, 1973; Goetzinger & Rousey, 1959; Holt, 1993; Pintner & Patterson, 1917; Pugh, 1946; Wrightstone, Aronow, & Moskowitz, 1963)."

LaSasso has also noted "the Commission on Education of the Deaf (1988) cited deaf students' scores on standardized reading tests as one of the most serious educational problems facing deaf children in the United States (LaSasso, 1999)." Paul's article has also noted that "it is well documented that most students with severe to profound hearing impairments who graduate from high school do not read as well as their normally hearing counterparts (Paul, 1999, citing Allen, 1986; Paul 1998)."

"The most recent available standardized reading achievement test scores (Norms Booklet, Stanford Achievement Test 1996) show that reading levels are essentially the same today as they were 30 years ago, despite the development and widespread use of manually coded English systems (LaSasso, 1999)" such as Seeing Essential English, Signing Exact English, Linguistics of Visual English, Signed English, and Pidgin Sign English.
"The limited success of educational systems in affecting achievement levels of deaf students has led some" (LaSasso, 1999, citing Bowe, 1991; Lytle & Rovins, 1997) "to suggest that less emphasis be placed on language and communication issues, and greater emphasis be placed on subject matter addressed in the schools and on teachers' ability to address this subject matter (LaSasso, 1999)."

LaSasso believes that "reading comprehension, like other cognitive processes, is covert and cannot be observed directly. If one is to assess what the student has learned from reading, so that appropriate instruction can be provided, the student needs to do something (i.e., complete some task), either during or after reading, that can be observed, measured, evaluated, and interpreted (LaSasso, 1999)."

Comprehension problems.

The Garrison, Tesch, and DeCaro article discussed the examination of deaf and hearing students' responses to individual items on the Tennessee Self Concept Scale (TSCS). Their study was to 1) "investigate the levels of self-concept in a sample of students entering the National Technical Institute for the Deaf; to examine the stability of student responses on a self-concept questionnaire over a period of two weeks and 2) to examine deaf students' semantic understanding of certain test items on the TSCS, using an interview technique (Garrison, Tesch, and DeCaro, 1978)." The Garrison, Tesch, and DeCaro study also discussed the "specific types of students' comprehension problems such as unfamiliarity with linguistic structures, for instance, the negation words and idiomatic expressions, and lack of direct correspondence of English words (Garrison, Tesch, and DeCaro, 1978)." The study discussed "nearly all of the students interviewed had problems understanding negatives which were implied by comparisons and/or inferences. For example, many students were found to have overlooked the negative
connotation of the item, ‘I should love my family more,’ and instead interpreted the item in its positive form as ‘I should love my family’ (Garrison, Tesch, and DeCaro, 1978).” Idiomatic expressions were the source of confusion for deaf test-takers. For instance, “such expressions as, ‘I am mad at the whole world’ were not frequently understood (Garrison, Tesch, and DeCaro, 1978).” When Garrison, Tesch, and DeCaro gave their students the examination, they noted that “subtle negative connotation, idiomatic expressions, and lack of direct correspondence of English words with manual expressions, affected 14 of the 20 items used in the interviews. Thirty-three of the 100 items on the complete test were characterized by at least one of the above linguistic difficulties, which include the structures of comparatives, inferentials, and negation to produce bias against deaf respondents (Garrison, Tesch, and DeCaro, 1978).”

Test Format Issues

Based upon the above-mentioned reading and testing problems, I am interested in learning more about students’ responses on test questions when they take the DDC Publishing practice test. I would like to investigate whether they have any difficulties related to reading comprehension, their ability to follow written directions (for instance, would there be any possible sequential problems?) and their ability to use their technical skills to answer the questions. The DDC Publishing practice test requires the test-takers to do the reading and following directions and apply their technical skills in order to answer the questions.

Reading Comprehension.

As stated before, most deaf students’ reading achievement levels are below that of their hearing peers. From the Wilbur article, for instance, reading problems related to reading “stem from a) inadequate language skills, compounded by reduced input due to the hearing loss, b) inadequate teaching methods due to concerns over communication modality and lack of appreciation of the complexities of language acquisition, and c) teacher focus on sentence structure over other
aspects of language use (inferencing, paragraph structure, conversational and story structure as transmission of sequenced information (Wilbur, 2000)." The Paul research has shown that "the comprehension of a text, particularly the ability to answer inferential questions about it, depends on the quality and application of prior knowledge" on students' part (Paul, 1999)." The less prior knowledge deaf students have, the chances of comprehending test questions is reduced.

**Ability to follow the directions (possible sequential problems).**

Chaleff and Toranzo noted that when it comes to "administering the tests to individual students, the educational evaluators noticed that the students demonstrated behaviors that hurt their performance, and that they generally failed to do things that were necessary for success on the test (Chaleff and Toranzo, 2000)." Chaleff and Toranzo mentioned that if we don't introduce our "students who may use language at home differently from the test, the expectations of the tests, will be at a disadvantage when trying to take it. Without an introduction to test language and format, children whose sociolinguistic groups are most different from that represented on the test will be much more likely to receive low scores (Chaleff and Toranzo, 2000)."

**Technical Skills.**

The DDC practice test measures students' technical skills in using particular Microsoft Office software, for instance, in this study, Microsoft Word. The students should have learned the technical skills required to be proficient in using the software during the courses that they have taken. Student performance may be affected if, for example, the student did not learn the skill or did not retain the learning or was not able to transfer what they learned to another application.

**Test-taking strategies.**

Based upon the above observations, we can note that deaf students have difficulty in some areas when taking tests; therefore, they developed test-taking strategies such as guessing and visual
matching when answering the test questions. LaSasso has noted “test-taking strategies used by deaf readers indicate that deaf students tend to guess on multiple-choice tests and modified cloze tests more often than hearing students. (A cloze test is a paragraph or short passage in which every fifth word has been deleted, a blank inserted in its place, and the test taker is instructed to write the one word in each blank thought to have been used by the author). Deaf participants tended to guess more often than hearing participants (LaSasso, 1999).” Another test-taking strategy included “visual matching extensively by deaf readers (LaSasso, 1999, citing earlier studies, (1985 and 1986)).” This strategy occurs “when deaf students can look back at the text while constructing short answers to questions. It involves responding with a verbatim word or series of words that occur within two lines above or below a word in the text that matches a word or words in the question (LaSasso, 1999).” Other test-taking strategies LaSasso has mentioned are the “elimination of unlikely distractors, word/idea association, and selection of the correct item based on its position among choices on a multiple-choice test (LaSasso, 1999).”

**The need for a test-taking component of the curriculum.**

Based upon deaf students’ test-taking difficulties and deriving from their test-taking strategies, there is a need to include a test-taking component into our teaching curriculum. LaSasso believed that “most deaf students, like hearing students, need formal instruction and practice in test taking to develop the abilities to demonstrate what they have learned via the full range of tasks and response modes experienced by hearing peers (LaSasso, 1999).” LaSasso has listed several components we should keep in mind for our teaching methods:

- “Comprehension tasks should include questions and nonquestion tasks.
- Questions and responses should be communicated through the air (conversationally) using the child's preferred communication method (e.g., signs, fingerspelling, cues, or oral methods) and in print.
• Questions should vary in terms of (a) question types (e.g., wh- or incomplete statement stems), (b) response formats (e.g., multiple choice, short answer, essay), (c) testing conditions (e.g., timed vs. untimed or lookback vs. no lookback), and (d) types of information sought (e.g., main idea, supporting detail, time and setting of stories, characterization, sequence of events).

Comprehension without a correct answer.

For teachers to consider students’ responses on tests, LaSasso has noted “the assumption that an incorrect response to a comprehension question automatically reflects a lack of comprehension also needs to be questioned (LaSasso, 1999).” Not only the “incorrect response may reflect a lack of comprehension, it may also reflect one or more of the following:

1. poor test preparation.
2. lack of experience with the particular type of test (especially with cloze tests).
3. difficulty with question forms or language used in questions (wh-questions or incomplete statements).
4. problems with vocabulary or syntax.
5. memory problems (especially in nonlookback situations).
6. difficulty organizing thoughts (especially in essay exams).
7. difficulty expressing thoughts in writing (again, in essay exams).
8. spelling problems.
9. problems budgeting time during the test.
10. unfamiliarity with grading criteria (especially in essay exams, in which there are usually criteria pertaining to areas such as organization of thoughts, clarity of expression, and appropriate referencing).
11. anxiety in testing situations.
12. general state of physical health at the time of the test.

The replicability of this project. The project has the potential to be useful for other programs serving deaf or hard-of-hearing students or English-as-second language (ESL) students
considering training for MOUS exams. This project might apply to training for other “skill”
based testing or assessment of skills (outcomes assessment), in other words, this methodology
used here could be used on other tests. We would be able to document the procedures for testing
deaf students and the process could be used to evaluate other computerized tests. Upon the
conclusion of the results and interviews, summarized test results will be shared with the Business
Careers department for their curriculum modification. This project could be replicated by
another researcher who may wish to analyze the computerized tests further. The Business
Careers department, AST Program could use this model to analyze other components of
Microsoft Office software.

Business educators’ different perspective.

Business educators have a different perspective on students’ skills from employers. Several
studies indicated that business schools were not able to keep up with quick changes in the
business environment and that business educators do not teach or encourage communication,
verbal skills, etc. as areas of importance to their students, which the businesses require. A study
that looked at management professors’ perceptions of the skills of entering management majors
found the professors felt the students had “poor writing skills, and more than 43 percent felt that
students graduating in management still did not exhibit good writing skills, and almost
67 percent felt that high schools were not doing a good job of developing verbal skills, and over
56 percent felt that entering management majors did not have good verbal skills (Lainer, et al,
1997). Lainer also concluded that even though the “management students are perceived (by
faculty) to lack written, verbal, and quantitative skills and are especially weak in communication
skills,” it showed that “current management curricula do not specifically teach or even encourage
the development of such skills, although the business community clearly wants management
graduates to have them.
Need to keep curriculum up-to-date.

Clearly, employers, business faculty, and even students recognize the importance of certain skills such as reading and writing; however, it is disturbing to see that business educators have trouble keeping up with changes and the curriculum revision process is slow and often does not match businesses' needs. Tanyel, et al (1999), noted that a research study conducted by Moore in 1997, predicted "many business schools will not survive because many corporations are assuming a larger role in the education of their employers." Tanyel went on to discuss how "management educators in business schools struggle to revise and update the curricula to produce graduates with needed skills." The American Assembly of Collegiate Schools of Business has made efforts to make business education move forward quickly, but "still, the business environment changes faster than curricula at colleges and universities because of the often cumbersome process involved in curriculum revision, and so forth (Tanyel, 1999).

Collaboration between businesses and business institutions.

Now that we have seen the importance of certain characteristics and skills, and the importance of timely curriculum revisions, a study conducted by Kuchinke, et al showed that collaboration between business schools and businesses is vital to improving the curriculum and a sense of community. Kuchinke also noted that "employees with insufficient levels of basic skills range from about 20 to 40 percent of the workforce and this situation is expected to worsen as new labor market entrants will come increasingly from economically disadvantaged populations who traditionally have had poor success in school and inadequate access to formal education (Hull, 1991, as cited by Kuchinke, 1998)." Based on these findings, a study was conducted on five small family-owned businesses in rural Minnesota to "identify the current job functions, assess the training needs of present workforce members, and provide training to current and future
workforce members (Kuchinke, 1998). It was found that “there was a clear expectation on the part of the businesses that training lead to increasing profitability and higher levels of productivity and product quality. Training is also expected to lead to improvements in the internal operation of the organizations through higher job satisfaction and motivation, better decision-making and collaboration, and a more flexible work force with longer job tenure (Kuchinke, 1998).”

This project demonstrates new strategies: This project will demonstrate a formal way of documenting students’ skills for employment. The students’ results will be collected and items that are incorrect will be analyzed in order to find the problem areas students are experiencing. For the pilot study I conducted interviews with all four students to discuss their understanding of the directions and individual test items. I reviewed the results of this analysis along with interviews of select faculty to make recommendations for preparing for the MOUS certification in the future.

3. The quality of the project design: Does the design address the needs of the targeted population?

This project will address the needs of the target population—deaf business students at NTID, who will be entering a workforce that requires them to have technical skills in computer technology. Employers need proof of technical skills; more and more companies have some kind of evaluation associated with being accepted into careers. Using the MOUS Practice certification-training program will give students an idea of their own technical skills. The purpose of this thesis is to question whether the NTID Business Careers students have the knowledge and skills to pass the MOUS Practice certification program, and does the NTID’s Business Careers department’s curriculum address the skills needed for students in order to pass
the certification program. This would provide the Business Careers department knowledge about the success of their curriculum in matching the needs of the employers.

Additionally, I have investigated whether deaf students have difficulty understanding the directions presented to them during the MOUS Practice certification test to determine the possibility of reading comprehension problems associated with deafness which may pose a problem with standardized test-taking. Or, do deaf students have difficulty with specific types of test items? Students’ answers and comments after the interviews will help me and the program faculty to have a better understanding where students have problems and we can modify our curriculum accordingly. With these items in mind, I conducted two studies: one was a pilot study with four business students; the second was a larger study with fifteen students using the DDC Publishing test for MS Word 2000. The test included ninety-nine questions, which took approximately one hour to complete. For the pilot study, I introduced and demonstrated to the students the procedures on how to answer the questions.

My observations on four students during the testing were that they did their best to answer all of these ninety-nine questions. During the testing, students raised a few questions related to vocabulary or questions themselves that gave me a good insight of their vocabulary and reading difficulties. I offered some assistance to the students but not to a great extent, for I wanted to see how these students performed while taking the test with little assistance or none. One student had slight difficulty with the answering process. When he answered the question(s), a dialog box appears depicting “Repeat Question” and “Next Question” buttons. This student commented that he was not finished with his answers and pressed the “Repeat” button repeatedly until he gave up and proceeded with next question. At that point, I was unsure if the software accepted his answer to imply his work was done or the system was too sensitive and the dialog box came up regardless of whether he was finished with the question or not, which indicates to me that the
some of the questions may be vague or the student answered the question incorrectly. Since this particular student was frustrated with the dialog boxes, causing him to give up and move on to the next question, it lead me to think that kind of frustration could affect his true score, and it may also happen to other students in my larger study.

All four students were finished with their test within the average of an hour. One student finished his test in 36 minutes and one student finished her test in one hour and ten minutes. Based on my pilot study, this test should take students approximately an hour to complete.

Immediately after each student's completion of the DDC testing, I interviewed them individually to discuss their observations regarding the software; their test-taking abilities; and their ability to respond to the questions. These interviews were conducted in order for me to investigate the possible reasons for their difficulties in answering certain questions. In general, the students felt the test was good to use and practice from, and some felt that the test should be improved. For example, some students felt that certain questions should be less vague; others wanted to know after responding whether their answers were correct or not. In general, they felt that they had enough technical skills in order to complete the test, however; they learned from the questions that they needed to learn more in certain areas such as web page or hyperlink functions. These were areas that were minimally taught in the classroom. The students all agreed that taking the test was an excellent way of learning about their true technical skills on Microsoft Word software. Their observations implied to me the testing process is not only a way for the Business Careers department to improve their curriculum, but also an excellent way for students to understand their strengths and weaknesses. Students’ knowledge of their weak areas will enable them to practice in those areas and to further their technical knowledge in order to acquire certification.
When students completed their test, I printed their results and analyzed them to locate the most problem areas. There is an analysis at the end of the summary reports for each student. A summary of student answers to my interview questions related to the DDC software follows:

1. **Overall, how do you feel about the DDC software?**

   Students' responses vary slightly—some felt not quite confident of their skills upon completion of the test, some understood the questions and some were slightly confused. Two students felt that some questions were "vague" because students were unsure of how to answer properly and they preferred the questions to be clearer and to the point instead of being "vague." One student felt that the DDC testing software was too "old" and needed to be upgraded to current standards because he noticed that certain functions he felt was absolutely correct, but somehow his answers were incorrect regardless.

2. **Do you feel that you have enough technical skills to do well in this test?**

   All four students felt that they had enough technical skills to get by through the test, but they were able to learn during the testing that they needed to improve or learn certain skills in order to be able to provide correct answers. But they felt their courses helped them to figure out ways to answer the questions.

3. **Did you understand the process of reading and answering the questions?**

   Generally, students were able to understand the process of reading and then answering the questions. Initially, they were a bit confused on how the process worked but they were able to catch on after a few questions. One student commented that he wished that the software would let him know whether his answers were correct or not immediately.

4. **Were you able to understand the directions with little or no difficulty?**

   Three students felt that the directions were either very easy or clear. One student felt that the questions were generally vague and on-the-surface, because she felt that the directions would require her to do a task, so she thought, and then a dialog box appeared on the screen asking her if she would "repeat" the question or proceed with the next question, and she became unsure if she was "finished" with her job.

5. **Were you able to do the functions to answer the questions you have never done before? (meaning—some aspects of MS Word functions you have never seen or done before?)**

   Generally, all students commented that they were able to answer some questions doing certain functions they have never performed before and felt that they answer correctly. Some students did the functions regardless, but were unsure if they answered correctly or not. Upon this particular observation, with some functions they never did before, they knew that they needed to learn further about the MS Word functions before graduation.
6. From your observations during testing, do you feel any certain aspects of MS Word should have been taught, or taught further?

All four students’ answers were nearly consistent: some learned the material that was taught in the classroom but felt that the material, for example, hyperlinks or labels, should be taught further (need more reinforcement in each course they are taking)... and those who felt they knew that they gave correct answers were well-taught in the classroom.

7. Did you understand the “meaning” of the questions? (in terms of the importance of having good education to understand the DDC test’s purpose to achieve certification and eventual success in their future job?)

One student felt that meaning of the questions were easy, because he was mainstreamed taking AP classes, read books often, and attended school since he was a year old, while other students felt that the questions were fine but some were vague, thus causing them to doubt their knowledge/skills once in a while. One student felt she was “forced” to answer the questions one way instead of the way she knew how.

8. Did you feel that you had a good experience taking the test?

Three students felt that they liked the test, and felt confident enough to pass the test. One student disliked the test because of the vagueness of the questions, but she felt it wasn’t too bad for the first try, and admitted that it was a good use of the test to measure her technical skills and as well as her strengths and weaknesses.

Based upon their observations, I formulated my own hypothesis such as possible sequential problems, reading, vocabulary comprehension and a few possible technical problems associated with the DDC software. I then further analyzed the students’ results by creating a table summarizing students’ performance. One student out of four or 25 percent, passed the MOUS Practice test with the score of 78 percent, as noted in the gray area in the table. (In order to obtain certification in Microsoft Word 2000, the passing percentage is 75, representing the proficiency level as defined by DDC Publishing Testing Center).

Even though only one student acquired 78 percent, the other three students were quite close to achieving 75 percent. The questions students missed were compared with the curriculum to determine whether or not the skills were taught. Nine out of the 99 items (9 percent) represented the material not taught in the classroom.
All four students in this pilot study are associate of applied science degree candidates who are enrolled in liberal arts level courses. Two of the students were within five points of passing and one was with eight points of passing. These results imply that the reading levels of the students influence the results of the test.

With the assistance of AST faculty, I conducted a larger study, consisting of fifteen second and third-year deaf business students using the same DDC Publishing test and the same procedures as described for the pilot study. I then analyzed the students’ results and established a table depicting them to give me an idea of certain problem areas.
The students' test results were sorted and 5 out of 15, or 33 percent, passed the MOUS Practice test with the score of 75 percent or better, as shown above in the gray areas. Three students were chosen from different degree programs for interviews: diploma; associate of occupational studies; and associate of applied science. The students I interviewed did not acquire scores of 75 percent or better. For the final study, I selected 10 questions out of 99, which were answered incorrectly by all three students to determine whether they had problems related to reading, vocabulary and technical problems. Four questions out of the 99 on the test were not currently taught in the curriculum. This definitely indicates that the students' errors are related to the material not taught in the classroom, as noted below:

<table>
<thead>
<tr>
<th>Question</th>
<th>Students Answered Incorrectly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 18</td>
<td>15 students answered incorrectly</td>
</tr>
<tr>
<td>Question 73</td>
<td>13 students answered incorrectly</td>
</tr>
<tr>
<td>Question 75</td>
<td>15 students answered incorrectly</td>
</tr>
<tr>
<td>Question 84</td>
<td>11 students answered incorrectly</td>
</tr>
</tbody>
</table>
However, from these two studies, low scores are noted in the two categories, Managing Files and Pictures & Charts. I deduce that three out of four questions (from 4 out of 99) were noted in Managing Files and Pictures & Charts, were not taught in the classroom. And, approximately other half, based upon the student interviews were related to reading and vocabulary comprehension difficulties. The other category, the Picture & Charts, only consists of three questions, which can influence the students’ scores if they answered at least one incorrect answer out of three, besides the reading and vocabulary difficulties.

**Interviews with Students.** I showed Student 7 who earned 58 percent on her test and is in the diploma program the list of questions that were answered incorrectly by her and two other students. In general, this student remarked that she was either “unsure” or “unclear” about the questions asked of her. Also, she seemed to be unfamiliar with a few questions such as “insert today’s date as a field that will automatically update. Use the default date format,” which leads me to conclude that she probably knew some functions in the MS Word, but was not quite able to comprehend the questions asked of her, hence the vocabulary and reading comprehension difficulty. Another instance related to vocabulary difficulty was the term “rotate,” which meant to turn the text to the side.

I spoke with Student 12 who earned 43 percent on his test and is earning an associate of occupational studies degree and he felt that some technical questions on the test were not stated clearly for him to properly answer the questions. He felt that his incorrect answers were mostly due to lack of memory because the classes he took were fast paced and students had to read through their textbooks quickly in order to complete their assignments. He also indicated there were vocabulary words on the test questions he was unaware of. He recalled in his classes he had to depend on the appendix to find the meaning of the words. However, he felt that the test
was a good practice for him in order to know what the companies in the world of work expect of college graduates.

My last interview with an associate of applied science student (Student 14) who earned 73 percent showed me that she had slight difficulty with the ten selected questions due to some vocabulary comprehension, and a few technical difficulties. At least two or three questions were carelessly answered. She stated that she was confident when she took the test but felt that the DDC testing software should allow the test takers to use their preferred methods to answer some questions (for example: “Save” function—a student might use CTRL + S while another student who may pull down from “Edit” and click “Save” from the menu). There was a technical aspect, in her opinion, that could also be improved which was the “double-check” method which the test software would allow the test taker to review their answers before submission. She knew that she produced some incorrect answers and wished that she could go back and revise her answers, which leads me to think that some careless answers and technical difficulties may have affected her true score which could have been above 75 percent.

Conclusions From The Study.

Degree Level Comparisons: As noted on the table on page 19—the five students who successfully passed the MOUS Practice test with 75 percent or better were three associates of applied science (AAS) and two associates of occupational studies (AOS). The other group of students who did not achieve 75 percent or better on the test included four AAS, five AOS, and one diploma level student. The results of this group does not support the theory that students who are at the AAS degree level tend to be more successful on the MOUS Practice test. Possible reasons for the group who did not achieve 75 percent or better may include the following: may know the material but not always understand the test questions; are currently in classes that do
not focus primarily on MS Word; may have forgotten some tasks; versions of MS Word 95 or 97 did not include some features like the web page format or format painter; or these students were exposed to the skill but did not get enough practice to transfer their skills to similar tests.

Based upon the interviews with students from three-degree programs, it seems that vocabulary and reading comprehension remains a difficulty for deaf business students. Technical problems such as not being able to go back to recheck the answers and students being unsure if they had performed functions correctly to answer a few questions were also some problem.

**Recommendations.** Since the vocabulary and reading comprehension remains a difficulty for business students, I would recommend that the faculty build in review of topics throughout the curriculum to assist their students to maintain skills learned until they are ready for graduation and employment. For instance, LaSasso’s article mentioned that the focus should be more on “what to teach than on how to teach,” and suggested that the paradigm shift be expanded to include both subject matter and test-taking abilities needed for students to demonstrate their comprehension of the subject. Vocabulary-related to software should be emphasized in the classroom, requiring students to use the correct vocabulary-related software terminology when asking questions or giving presentations. The Lee and Blaszczynski article discussed that not only the computer literacy is important, but also students have to be prepared for positions involving computers and communication, that would involve software-related terminology in the work setting. Also, in order to reduce technical difficulties during test-taking time, students should be able to understand the practice question and the purpose of the “repeat” and “submit” buttons clearly without any immediate feedback. This relates to LaSasso’s recommendation that suggest that reading comprehension needs to be measured and evaluated, so the appropriate instruction can be provided.
Another recommendation would be to simulate the test environment in the classroom during demonstration tests. As Chaleff and Toranzo article suggest, we need to be sure to introduce test language and test format so that the deaf students will not be at a disadvantage when taking the test. The instruction could provide written instructions for the skill to complete and allow the student to “repeat” or “submit” the answer without any immediate feedback. LaSasso’s article discussed the important educational decisions that continue to be made about deaf students on the basis of their test performance. Therefore, based upon the test performance, deaf students need exposure to and practice with variety of tests and its procedures, for teachers to assess their performance. Based upon the students’ performance, especially with deaf students, it is important to be able to expose them to different test formats which they can learn and be able to refine their test taking skills. “It is generally acknowledged that the better test takers are those who have had extensive experience with tests (LaSasso, 1999).”

CONCLUSION

In summary regarding the importance of student outcomes assessment, several important findings surfaced from the articles, pilot and final studies. First, it is important for deaf students to have an opportunity to assess their technical competency. Second, we business educators should be able to maintain timely curriculum revisions and keep up with the quick-changing workforce requirements. For instance, several studies generally have concluded that technical competency education is important and needed in order to be prepared to meet the needs of employers. Third, we need to find ways to improve students’ reading comprehension, even though we understand that deaf students generally have difficulties in reading and vocabulary, we need to find ways to assist our students in developing good communication skills in the work setting. Lanier’s article noted that there is a need for a “significant restructuring of the teaching
process at both high school and college levels, because the business community clearly wants students to have them (Lainer, et al, 1997)."

Fourth, since standardized assessment is becoming more popular as a means of evaluating potential employees technical skills, deaf students would benefit from experience with this type of formal skill assessment. The assessment would give students the opportunity to evaluate their skills in a formal way before looking for employment; it would allow students the opportunity to evaluate their weaknesses and improve their skills.

4. The quality of the project evaluation: Did you accomplish what you set out to accomplish? Is the evaluation linked to your objectives?

The evaluation links to my and Business Careers’ objectives, which were to 1) analyze students’ understanding of the DDC Publishing test questions; 2) review the Business Careers’ curriculum regarding its overlap with test questions; 3) examine the problems deaf students have with standardized assessment; and 4) to determine if students understand the test questions, but forgot the content, so we can determine ways to improve the preparation of deaf students for the workplace and increase their employability.

5. The quality of the project personnel: What are the qualifications of the staff?

The people involved in this project are myself; my primary mentor, Gary Long of NTID’s Research Department; Karen Conner, NTID’s Business Careers Department as my secondary mentor and content person; Administrative Support Technology (AST) faculty, and Business Careers students.
6. The adequacy of the resources (budget, facilities, equipment, and potential for continued support or activity.)

This project is voluntary on my part requiring no monetary resources and the facilities for the testing would be in one of the Business Careers labs, and its equipment would be computers and the MOUS software. There is potential for continued support because the tests will be used for other students for further curriculum improvements.
REFERENCES


