

RIT

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Perceptions of Communication, Classroom Interaction Frequency and Academic Achievement in Online Courses.

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Online courses at RIT have become an increasingly popular option for campus students.

Now over 60% of online students are full-time.

In 2008 there was a **22% increase in "day coded" enrollments** over the previous academic year.

Year	Total Enrollments	Day Coded Enrollments
2002	7000	2000
2003	7000	2500
2004	7500	3000
2005	7500	3500
2006	8000	4000
2007	8000	4000
2008	8500	4500

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Also in 2008, there was a 32% increase in deaf and hard-of-hearing enrollments in online courses.

In the 2008 academic year over half of the B.S./M.S. NTID students took at least one online course.

Year	NTID Enrollments	NTID Unique Students
2002	250	150
2003	280	160
2004	260	170
2005	320	180
2006	300	190
2007	350	200
2008	450	220

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Challenges for D/HH students in mainstream classes

- Pace of Instruction
- Lack of pausing during instruction
- Multiple conversations to process (e.g. small groups)
- Process Time- time required to process information into another language
- Interpreters are not always an accurate reflection of students when voicing for them
- (www.rit.edu/classact)

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U.S. DEPARTMENT OF EDUCATION

Evaluation of Evidence-Based Practices in Online Learning
A Meta-Analysis and Review of Online Learning Studies

“The meta-analysis found that, on average, **students in online learning conditions performed better than those receiving face-to-face instruction.**” (page 11)

“The practice with the strongest evidence of effectiveness is inclusion of mechanisms to **prompt students to reflect on their level of understanding as they are learning online.**” (page 52)

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Research Questions

1. How does student academic achievement in online courses compare to achievement in face-to-face (F2F) courses at RIT?
2. How does deaf/hard-of-hearing academic achievement compare for online and F2F courses at RIT?
3. If online is different from F2F, what are some of the factors contributing to student success in online courses?

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Methodology

Two studies explored student success in online courses from different perspectives:

1. **Grade Distribution Analysis** – To answer research question #1 and #2, grades of all students taking online courses and all students taking F2F courses with the same course number were requested for the period 20071 through 20083. The data was used to compare deaf/hard-of-hearing and hearing students in online and F2F sections.

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Methodology - continued

2. **Level of Interaction Analysis** – To answer research question #3, we surveyed students in 431 online courses from 20071 through 20073 on their perceptions of important factors related to learning. The survey results were summarized based on a quantitative interaction metric from our course management system used to rank courses from high interaction to low interaction by quartiles.

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Slide 7

GL1 Gary Long, 10/28/2009

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Results - Liberal Arts

The College of Liberal Arts was chosen for more detailed course analysis in which we filtered out sections without deaf or hard-of-hearing enrollments.

College of Liberal Arts	Online Sections GPA	Other Sections GPA
Hearing	3.06 (n=1016)	3.00 (n=8952)
Deaf/Hard-of-Hearing	2.96 (n=67)	2.56 (n=581)

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Comparable COLA Courses for Hearing Students

For Hearing students, online COLA courses had more A's and F's, and fewer C's than comparable face-to-face courses ($p < 0.0001$).

Grade	Online Sections (n = 1016)	Other Sections (n = 8952)
A	~42%	~38%
B	~34%	~35%
C	~14%	~20%
D	~4%	~5%
F	~5%	~2%

Percent within levels of Course Type.

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Comparable COLA Courses for NTID Students

For NTID students, online COLA courses had more A's, and fewer C's, D's, and F's than comparable face-to-face courses ($p = 0.015$).

Grade	Online Sections (n = 67)	Other Sections (n = 581)
A	~33%	~19%
B	~40%	~36%
C	~20%	~32%
D	~4%	~8%
F	~3%	~5%

Percent within levels of Course Type.

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SUMMARY: Hearing, Deaf, and Hard-of-Hearing Students in at RIT demonstrate better academic achievement in online courses than they do in comparable F2F classes.

These findings are most pronounced for the Deaf and Hard-of-Hearing Students.

WHY?

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Results – Level of Interaction

The survey had 15 questions, each with a Likert scale response (strongly agree, agree, disagree, strongly disagree, no response). Positive and negative responses were combined to create a binary response variable (agree/disagree). A binary logistic regression model was used for seven questions in the following areas:

Satisfaction

- I am more satisfied with this course than I am with most courses.

Learning

- I learned more in this course than I do in most courses.
- I learned more from other students than I do in most courses.

Interaction

- I interacted with other students more than I do in most courses.
- I interacted with the instructor more than I do in most courses.

Communication

- My ability to communicate my ideas improved because of the online interaction in this course.
- I was able to express my ideas more clearly because of the online interactions.

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Factors in regression

1. Q-Code (Quartile ranking of interaction):

	Avg Msgs/Week	% Using Groups	Avg # Features	Avg GPA
Q1	9.3	62%	7.2	3.44
Q2	4.2	38%	6.5	3.39
Q3	2.0	19%	5.9	3.19
Q4	0.4	10%	3.9	3.18

Quarter	Enrollments		Total Responses		Response Rate	
	Total	D/HH	Total	D/HH	Total	D/HH
20071	1989	69	633	38	32%	55%
20072	1994	95	398	32	20%	34%
20073	2007	89	252	18	13%	20%

2. Hearing Status (Hearing, Deaf, Hard-of-Hearing)

3. ESL Status (No, Yes)

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Results

Satisfaction and overall learning for the course were not significantly affected by Q-Code, Hearing Status, or ESL Status.

Learning from other students, and interaction with the professor were significantly affected only by Q-Code, with Q1 having the highest level of agreement, and decreasing with each quartile of interaction.

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Results for interaction with other students, improved ability to communicate and express ideas are shown in the following graphs. The output of the binary logistic regression is expressed in terms of the odds ratio for agreement with the given statement.

For example, in the graph to the right:

The odds of agreeing with this statement are decreased by a factor of 0.60 if the course has Q-Code Q2 compared to Q1.

The odds of agreeing with this statement are increased by a factor of 1.85 if the student is Deaf compared to Hearing.

I interacted more with other students than I do in most courses.

Category	Odds Ratio
Q1	1.0
Q2	0.60
Q3	0.40
Q4	0.25
Hearing	1.0
Deaf	1.85

Compared with Q1, the odds of agreeing with this statement are decreased for Q2, Q3, and Q4 ($p = 0.001$, <0.0001 , and <0.0001 respectively).

Compared with Hearing, the odds of agreeing with this statement are increased for Deaf ($p = 0.048$).

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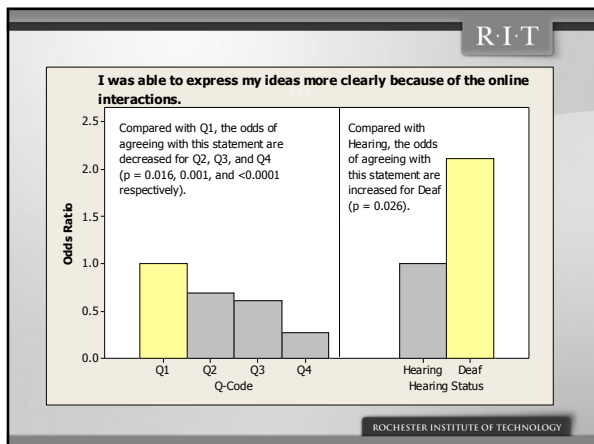
My ability to communicate my ideas improved because of the online interaction in this course.

Category	Odds Ratio
Q1	1.0
Q2	0.65
Q3	0.45
Q4	0.30
Hearing	1.0
Deaf	1.85

Compared with Q1, the odds of agreeing with this statement are decreased for Q2, Q3, and Q4 ($p = 0.006$, <0.0001 , and <0.0001 respectively).

Compared with Hearing, the odds of agreeing with this statement are increased for Deaf ($p = 0.008$).

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Student responses to the question: Why are you taking an inline course this Quarter?

"I am taking an online course this quarter because it's easier to understand what is going on in the class better and the level of communication is so much easier."

"I have taken this course in class, but it did not work well for me. I decided to take it online and see what I can do. I like it better because I get to research, read, and look up words when I am stuck. In class I can't do that."

"I have taken this course in class my freshman year, but I did not do well. I wanted to try this online and see what I can do. I have learned a lot more than in class, and it's great to have an online course, I value reading and writing more than going to a lecture."

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Discussion

Why such a discrepancy in grades for NTID students in online versus face-to-face COLA courses? There could be many factors at work – including instructor and the skills of students who choose to take online courses (both possible avenues for further research).

We conjecture two underlying factors contributing to student success in online learning courses. These factors may be even more salient for the deaf and hard-of-hearing students.

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1. Time Factors

Whenever a campus course meets, 8am, 12pm, 2pm, 6pm there will be some students who are prepared and ready to participate in learning activities.

But many students are not ready at the time prescribed by their course schedule. In asynchronous online courses students choose (within a narrow timeframe of a few days) when they are ready to participate in class.

Deaf and HH students may benefit from the increased time the online format allows for the processing of content and discussion. They may also benefit from having additional time prior to responding.

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2. Reflective and Recursive Discourse

The Department of Education meta-analysis found the strongest evidence of effectiveness to be mechanisms to prompt students to reflect on their level of understanding as they are learning. Whole class discussion, small group discussion, and group or team projects are the primary source of interaction in RIT online courses. The reflective writing associated with asynchronous text discussion is different, and potentially better in some ways for learning than the extemporaneous discussion or lack thereof that occurs in face-to-face courses.

The "bandwidth" of asynchronous discussion is much larger than anything available in a classroom so more students can participate more fully. Deaf and hard-of-hearing students, and English Second Language Students, can use the time available to them to craft messages that are more communicative than what they are limited to in the classroom., where the information may need to go through a third party interpreter or transcriber.

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Future Research

1. Update the analysis on levels of interaction to include metrics on the instructor presence, comparisons by college, and type of course.
2. Update the grade distribution analysis and look in more detail at each college, not only COLA.
3. Collaborate with a small group of faculty on a writing intensive course with multiple section offerings and at least one section designated for NTID support. Design an effective online and blended version of the course to compare to a traditional face-to-face version with particular attention on the deaf and hard-of-hearing student experiences.

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