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In Focus

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INSIDE

Learning Outcomes & Student Competence: Results from the 2006-2007 Graduating Senior Survey

I. Introduction

The Office of Institutional Assessment has been conducting Graduating Senior Surveys since 1989. Senior students who graduated in summer 2006, fall 2006 and spring 2007 were directed to complete the Graduating Senior Survey online as they completed their online graduation application. In this academic year, 3,695 graduates earned a total number of 3,715 undergraduate degrees from Mason. Among them, 3,146 completed the survey for a response rate of 85%.

The 2006-2007 Graduating Senior Survey included a variety of topics: learning outcomes, writing experiences, synthesis courses, global understanding and advising. This report focuses on the survey questions about learning outcomes for general education and the major. It examines the following questions: How competent do Mason graduates feel about themselves regarding general education outcomes? How competent do they feel about their knowledge and abilities in their fields of study? Do levels of self-reported competence vary by fields of study?

For this *In Focus* report, all survey respondents were categorized into two groups using the following definitions:

- ***Transfer students***: those who started college at another post-secondary institution as first-time freshmen and, later, transferred into Mason. They accounted for 58% of the survey respondents.
- ***Native students***: those who started college at Mason as first-time freshmen. They accounted for 42% of the survey respondents.

The following shows the college abbreviations used in the report and the number of respondents from each college:

- ***CEHD***: College of Education and Human Development (N=75)
- ***CHHS***: College of Health and Human Services (N=250)
- ***CHSS***: College of Humanities and Social Sciences (N=1,484)
- ***COS***: College of Science (N=213)
- ***CVPA***: College of Visual and Performing Arts (N=163)
- ***ICAR***: Institute for Conflict Analysis and Resolution (N=14)
- ***SOM***: School of Management (N=620)
- ***VIT&E***: Volgenau School of Information Technology and Engineering (N=333)

The results for additional survey questions are included in the full report of the 2006-07 Graduating Senior Survey. For detailed information on college and program level results, and for characteristics of survey respondents, please visit our website at ***http://assessment.gmu.edu/Results/GraduatingSenior/2007/index.cfm***.

Because of rounding, not all percentages add to 100% in this report.

II. Highlights

- Over 80% of the 2007 graduates rated themselves competent in each of the 14 general education learning goals. They felt *most competent* in written communication, critical thinking and analysis, oral communication, social and behavioral sciences, synthesis, global understanding and literature: over 90% of them felt competent or very competent.
- The average level of reported competence for **native students** in written communication is *significantly higher* than that of transfers. **Transfer students** rated themselves more competent in information technology and ethics in information technology than native students.
- For each of the 14 general education learning outcomes, students who reported that they had taken courses at Mason that emphasized a particular learning outcome are *significantly more likely* to feel competent in that area than their counterparts who did not take or who didn't remember taking such a course at Mason.
- Self-reported competence varies significantly by college for each of the 14 learning outcomes. *The Institute of Conflict Analysis and Resolution (ICAR)* has a small number of baccalaureate graduates. They reported higher levels of competence in written communication, critical thinking and analysis, social and behavioral sciences, oral communication, synthesis and global understanding than students from other colleges.
- Overall, 97% of Mason graduates felt they were competent in analyzing work in their field and had sufficient knowledge about important work in their field. About 90% felt they were competent in conducting original research or creating original work in their field.

III. Previous Findings about General Education Learning Outcomes, 2003-2006

One of the repeating themes of the graduating senior surveys concerns 12 general education learning outcomes (U.S. history is no longer a requirement and is not reported here). The following website specifies Mason's general education requirements: http://www.gmu.edu/departments/provost/gened/requirements.htm. Some of these learning outcomes are also programmatic learning outcomes. For example, many undergraduate degree programs at Mason identify writing, oral communication, synthesis and global understanding as learning outcomes for their graduates.

In addition to Mason's general education requirements, the State Council of Higher Education for Virginia (SCHEV) requires all institutions to assess six learning outcomes: written communication, oral communication, quantitative reasoning, information technology, critical thinking and scientific reasoning. The first four SCHEV-required outcomes overlap with Mason's general education outcomes. The critical thinking outcome, although not listed as an explicit goal for general education, is implicit throughout the entire general education curriculum. Similarly, scientific reasoning is implicit in the natural science requirement of general education, but not explicitly stated.

Between 2003 and 2006, survey respondents were asked to rate the extent to which Mason contributed to their growth in 14 learning outcomes which are required either by general education or by SCHEV. Over the years, we have found that students answered these questions based on their *entire* educational experience at Mason, not just their general education experience. Not surprisingly, students tended to rate their growth in competencies (such as critical thinking and analysis) much higher than their growth in a specific subject matter (such as western civilization and the arts), particularly if the subject was not related to or reinforced in their major.

The 2006 graduates were most likely to say Mason had contributed very much to their growth in critical thinking and analysis, written communication, global understanding, social and behavioral sciences, and synthesis. **Native students** rated Mason's contribution *significantly higher* than transfers in written communication, global understanding, social and behavioral sciences, oral communication, literature, scientific

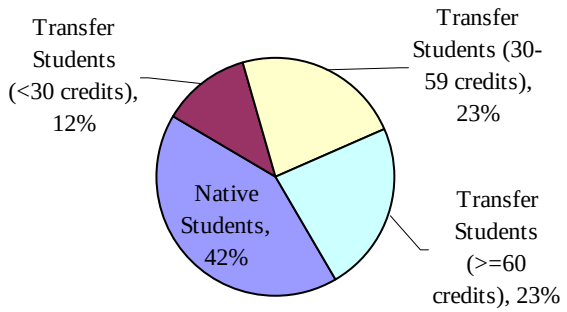
reasoning, natural sciences, arts, and western civilization. Similar findings were reported from the exit surveys between 2003 and 2005.

However, previous surveys did not ask students to rate their levels of competence in these areas. Previous data were not able to explain whether the perceived contribution to one's growth was related to the emphases of Mason courses. For these reasons, the 2007 exit survey asked students to indicate whether they had taken any courses at Mason that emphasized each of these 14 outcomes and how competent they felt about their knowledge and skills in each area.

IV. General Educational Learning Outcomes – Students' Recollections of Course Emphases

The 2007 survey asked students to indicate whether they had taken any courses at Mason that emphasized each of the 14 learning outcomes *before* they rated their competence in the corresponding area. Three options were provided: "yes," "no," and "don't know."

Figure 1: Self-Reported Transfer Status



Transfer status affects students' responses to these questions. As Figure 1 shows, 42% of the survey respondents were self-reported native students; 12% were transfer students who transferred less than 30 credits into Mason; 23% transferred 30-59 credits into Mason; and the remaining 23% transferred 60 credits or more into Mason. The last group of transfer students, accounting for 39% of all transfer students, completed most of their general education courses at other institutions and transferred into upper level classes (junior or senior class).

When students completed the survey also affects their responses. Many students filed intent to graduate and completed the survey several months before they actually graduated. Some students intentionally postponed certain general education courses to the last semester before graduation. Others "found," right before their intended graduation term, that they hadn't fulfilled one or more general education requirements. They ended up taking lower-level general education courses or synthesis courses after they completed the exit survey.

Please also note:

- Native students could test out or transfer credits from outside of Mason to fulfill certain general education requirements.
- The following analyses are based on *recollections and perceptions*, not official transcripts of the respondents.

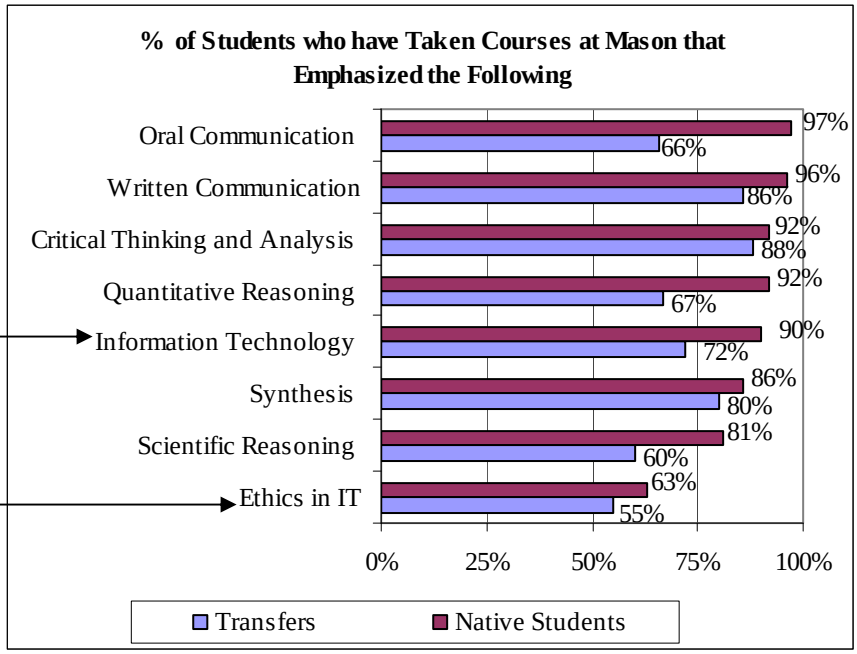
1. Foundation Courses and Competencies

Most native students took, or remembered taking, courses at Mason emphasizing the following competencies: oral communication (97%), written communication (96%), critical thinking and analysis (92%), and quantitative reasoning (92%) (see Figure 2). *Fewer* transfer students took or remembered taking such courses at Mason: between 80-88% said they had taken courses that emphasized critical thinking and analysis (88%), written communication (86%), and synthesis (80%). The percentages are lower for oral communication and quantitative reasoning: only two thirds of the transfer students reported taking such courses at Mason.

Figure 2. Foundation Courses and Competencies, by Transfer Status

Remember: *39% of the transfer students transferred 60 credits or more into Mason.*

Note*: Ethics in IT is an emphasis in some approved general education IT courses, but not all. Some students must take a separate IT ethics course.*



Information technology. Ethics in information technology is part of the information technology requirement of the general education curriculum. Students are required to "have classroom experience in, knowledge of, and appreciation for fundamental ethical issues relating to IT and the changing world" (from the University Catalog). Even native students who test out of IT 103 (a course taken by a large number of students to satisfy the general education requirement for IT) have to have "classroom experience" in IT ethics. The survey shows that 90% of native students reported taking a course in IT, but only 63% remembered taking a course emphasizing IT ethics. Seventy-two percent of transfer students reported taking a course in IT, but only 55% took a course emphasizing ethics in IT. It is likely that some students who recalled taking an IT course did have "classroom experience" in ethics but did not perceive it as an emphasis.

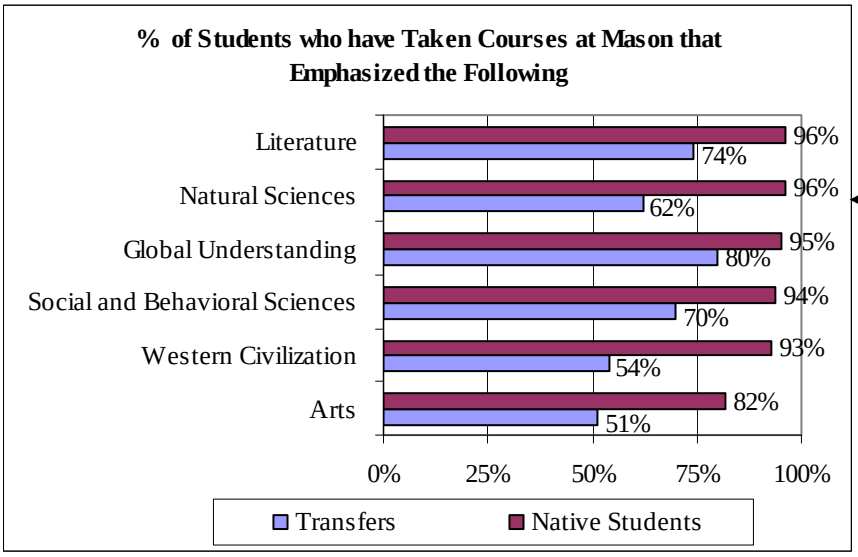
Synthesis. All Mason students, regardless of transfer status, are required to take one synthesis course. All the approved synthesis courses are upper-division courses that intend to engage students in the connection of meaning and the synthesis of knowledge. Some synthesis courses are designed as the final general education course and others serve as the senior capstone course for the major. Eight-six percent of native students and 80% of transfer students reported taking a course which emphasized synthesis. It is likely that by the time students filed for intent to graduate, some of them had not taken a synthesis course yet. However, synthesis, as a competency, was likely addressed in other courses, particularly in upper-division courses offered in the major.

Natural science and scientific reasoning. As part of the general education curriculum, students are required to take at least 6 credits in natural science. As Figure 2 shows, 81% of native students and 60% of transfer student reported taking a course which emphasized scientific reasoning. Figure 3 shows that *more* students, particularly native students, remembered taking a natural science course: 96% of native students and 62% of transfer students reported taking a natural science course at Mason. Some native students may NOT think their natural science courses emphasized scientific reasoning.

2. Core Courses

Most **native students** took, or remembered taking, courses emphasizing literature (96%), natural sciences (96%), global understanding (95%), social and behavioral sciences (94%), western civilization (93%) and the arts (82%). Among **transfer students**, 80% reported taking courses emphasizing global understanding and 70% had courses emphasizing social and behavioral sciences. For western civilization and the arts, only half of the transfer students had taken a related course at Mason.

Figure 3. Courses Emphasizing Core Requirements of General Education, by Transfer Status



***Note**: Figure 2 shows that 81% of native students and 60% of transfers reported taking a course emphasizing scientific reasoning.*

***Remember:** 39% of the transfer students transferred 60 credits or more into Mason.*

3. Courses *Transfer Students* less Likely to Take at Mason

Transfer students were less likely to take courses emphasizing the following:

- arts (45% said no and 4% don't know)
- western civilization (44% no and 2% don't know)
- ethics in IT (41% no and 5% don't know)
- natural sciences (37% no and 2% don't know)
- scientific reasoning (35% no and 6% don't know)
- oral communication (32% no and 1% don't know)
- quantitative reasoning (30% no and 3% don't know)

Transfer students were mostly likely to say that they had taken courses at Mason emphasizing critical thinking and analysis, written communication, synthesis and global understanding.

Students' perception of course emphases affects their perception of Mason's contribution to their educational growth. In previous years, transfer students rated Mason's contribution to certain educational outcomes significantly lower than native students, partially because some transfer students did not take related courses at Mason. The following analyses further show that for each of the 14 learning outcomes, students (native and transfers alike) who took a related course at Mason felt more competent than those who did not take or who didn't recall taking such a course at Mason.

V. General Education Learning Outcomes – Self-Rated Competence

1. Student Perceptions: Overall Levels of Competence

Students tend to rate their own competence much *higher* than the institution's contribution to their growth (see Table 1). The 2007 graduates felt themselves ***most competent*** in written communication and critical thinking and analysis: over 97% rated themselves very competent or competent. Over 90% of the students thought they were competent in oral communication, social and behavioral sciences, synthesis, global understanding and literature. These are the same areas that 2006 graduates were most likely to say Mason had contributed very much or somewhat to their growth. The 2007 graduates felt ***least competent*** in natural sciences and the arts; still, over 80% rated themselves competent in these areas.

Little difference is found when comparing the overall levels of competence for native students and for transfers. On 11 out of 14 learning outcomes, transfer students rated themselves as competent as native students. In written communication, however, native students rated themselves more competent than transfers; in information technology and ethics in information technology, transfer students stated higher levels of competence.

Table 1. Overall Levels of Competence, 2007

General Education Learning Outcomes	**Self-reported Competence, 2007 Graduates**				**Perceived Contribution from Mason, 2006**
	Very competent	Competent	Not competent*	Mean*	Very much/ Somewhat
Written Communication†	55%	42%	3%	3.52	89%
Critical Thinking & Analysis	45%	51%	3%	3.41	90%
Oral Communication	46%	49%	6%	3.39	83%
Social & Behavioral Sciences	46%	48%	6%	3.39	77%
Synthesis	44%	50%	6%	3.36	77%
Global Understanding	40%	52%	7%	3.33	83%
Literature	39%	54%	6%	3.32	72%
Western Civilization	30%	57%	13%	3.15	54%
Scientific Reasoning	30%	55%	14%	3.14	67%
Information Technology†	31%	54%	15%	3.14	70%
Ethics in IT†	33%	51%	16%	3.14	62%
Quantitative Reasoning	30%	54%	15%	3.13	72%
Natural Sciences	27%	56%	17%	3.09	62%
Arts	27%	54%	19%	3.06	57%

***Note**: The "Not competent" column combines the percentages of students who selected "not very competent" and "not competent at all." Very few students selected the second option. The table was sorted by the mean level of competence.*

** The survey included four options: 1=not at all competent, 2=not very competent, 3=competent and 4=very competent. Means were calculated based on the 4-point scale.*

† Indicate the mean differences between native students and transfers are statistically significant.

2. Perceived Course Emphasis and Self-Rated Competence

Competence gaps – frequency comparison. For each of the 14 learning outcomes, students who reported that they had taken courses at Mason that emphasized a particular learning outcome were *significantly* more likely to feel competent in that area than their counterparts who did not take or who didn't remember taking such courses. For example, as Table 2 shows, 98% of the students who had taken courses emphasizing written communication felt themselves competent in writing; in contrast, only 79% of those who did not or didn't know rated themselves competent – a difference of 19 percentage points.

Table Annotation 1:
Among the respondents who have taken a course at Mason that emphasized "written communication", 98% felt they were "very competent" or "competent" in written communication; in contrast, among those who did not or did not know, 79% thought they were competent or very competent. The difference is 19 percentage points.

Table Annotation 2:
When measured on a 1-4 scale (1=not competent at all and 4=very competent), the average competence level for students who have taken a course at Mason that emphasized "written communication" is 3.54; and for students who have NOT or did not know, the average is 2.99. A t-test shows that the former group perceived themselves significantly more competent than the latter.

Table 2. Levels of Competence and Course Emphases

Have you taken any courses at Mason that emphasized the following and how competent are you?	% of Students Rated themselves as Competent or Very Competent			Level of Competence: Mean Comparison*	
	Have Taken a Course at Mason	Have NOT / Don't Know	Percentage Difference	Have Taken a Course at Mason	Have NOT / Don't Know
Written Communication	98%	79%	19%	3.54	2.99
Critical Thinking & Analysis	98%	75%	23%	3.45	2.80
Oral Communication	95%	89%	6%	3.42	3.20
Social & Behavioral Sciences	96%	75%	21%	3.46	2.88
Synthesis	97%	62%	35%	3.44	2.60
Global Understanding	94%	79%	15%	3.36	2.92
Literature	95%	76%	19%	3.37	2.91
Western Civilization	89%	78%	10%	3.20	2.91
Scientific Reasoning	91%	58%	33%	3.26	2.59
Information Technology	87%	70%	17%	3.18	2.78
Ethics in IT	94%	55%	39%	3.35	2.52
Quantitative Reasoning	88%	64%	23%	3.18	2.72
Natural Sciences	85%	71%	14%	3.13	2.83
Arts	89%	54%	34%	3.21	2.53

** Rated on a 1-4 scale: 1=not at all competent, 2=not very competent, 3=competent and 4=very competent. T-test shows that the mean difference between the "have"-group and "have-not" group is statistically significant for each learning outcome.*

Large competence gaps are seen in the following learning outcomes between the students who took related courses and those who did not take or did not recall taking related courses:

- ethics in information technology (39 percentage points)
- synthesis (35 percentage points)
- arts (34 percentage points)
- scientific reasoning (33 percentage points)
- critical thinking and analysis (23 percentage points)
- quantitative reasoning (23 percentage points)

Note:
The survey did not ask respondents to recall how many courses they had taken at Mason that emphasized each of the 14 learning outcomes. Many students only took 1-2 courses for each of the specific subject areas such as the arts, literature and western civilization.

Moderate competence gaps are seen in the following areas:

- written communication (19 percentage points)
- literature (19 percentage points)
- information technology (17 percentage points)
- global understanding (15 percentage points)
- natural sciences (14 percentage points)
- western civilization (10 percentage points)

Oral communication shows the smallest competence gap, although the difference between the "have"-group and "have-not"-group is still statistically significant. Among the students who have taken courses at Mason that

emphasized oral communication, 95% rated themselves competent or very competent, compared to 89% of the students who did not take or who did not know.

Average levels of competence – mean comparison. When comparing the *average* levels of reported competence for each of the 14 learning outcomes (see Table 2, rated on a 1-4 scale), the "have"-group is significantly higher than that of the "have-not" and "don't know" groups combined. Further analyses show that, most of the time, students who did NOT know whether they had taken a course that emphasized a particular learning outcome rated their competence even *lower* than those who did not take such a course at Mason.

For the students who have taken related courses at Mason, the average levels of rated competence are the *highest* for the following areas: written communication, social and behavioral sciences, critical thinking and analysis, synthesis, oral communication, literature, global understanding, and ethics in information technology. Above 94% of the students thought they were competent in these areas. Even for the area with the *lowest* average level of competence (i.e., natural science), about 85% of students considered themselves competent.

For the students who have NOT taken or did not know whether they have taken related courses at Mason, the average levels of stated competence are the highest in oral communication, written communication, global understanding, literature and western civilization. Above or close to 80% of students rated themselves competent. In contrast, the arts, ethics in information technology, and scientific reasoning were rated the lowest with less than 60% of students feeling competent.

3. Levels of Self-Rated Competence by College

Obviously, students' entire curricular experiences at Mason impact their growth in knowledge and skills. The previous section shows how courses designed to address specific learning outcomes can increase students' feeling of competence. The following comparison of self-reported competence by college clearly shows that some fields/colleges seem to emphasize certain learning outcomes more than the others (see Table 3).

Table 3. Levels of Competence: Mean Comparison by College*

How competent do you feel about your knowledge or skill in each of the following:	College								Mason ALL
	CVPA	SOM	ICAR	CEHD	CHHS	CHSS	COS	VIT&E	
	N=163	N=620	N=14	N=75	N=250	N=1484	N=213	N=333	N=3,146
Written Communication	3.44	3.49	**3.86**†	3.39	3.40	3.62	3.32	3.35	3.52
Critical Thinking & Analysis	3.38	3.36	**3.79**	3.11	3.38	3.48	3.30	3.40	3.42
Oral Communication	3.34	3.40	**3.73**	3.29	3.36	3.45	3.24	3.28	3.39
Social & Behavioral Sciences	3.11	3.28	**3.64**	3.22	3.40	3.56	3.19	3.05	3.39
Synthesis	3.29	3.30	**3.69**	3.30	3.21	3.42	3.35	3.35	3.37
Global Understanding	3.20	3.29	**3.67**	3.11	3.19	3.42	3.25	3.19	3.33
Literature	3.34	3.20	3.33	3.17	3.26	**3.45**	3.21	3.09	3.32
Western Civilization	3.09	3.11	3.18	2.87	2.92	**3.26**	3.02	3.08	3.15
Scientific Reasoning	2.89	3.16	3.00	2.78	3.15	3.05	**3.52**	3.40	3.14
Information Technology	3.05	3.27	2.50	2.95	3.02	2.98	3.21	**3.68**	3.14
Ethics in IT	3.03	3.30	2.71	2.68	3.07	3.01	3.02	**3.55**	3.14
Quantitative Reasoning	2.90	3.33	2.75	2.84	2.97	3.02	3.32	**3.37**	3.12
Natural Sciences	3.02	3.03	2.56	3.05	3.28	2.97	**3.62**	3.27	3.09
Arts	**3.73**	2.90	2.91	2.91	2.95	3.11	3.00	2.83	3.06

** Means were calculated on a 1-4 scale: 1=not at all competent, 2=not very competent, 3=competent and 4=very competent.*

†The highest mean values are emboldened and the lowest underlined in the table.

Self-rated competence varies significantly by college for each of the 14 learning outcomes. **The Institute of Conflict Analysis and Resolution** (ICAR) only had 16 baccalaureate graduates in the 2007 academic year and 14 of them responded to the survey. They reported higher levels of competence in written communication, critical thinking and analysis, social and behavioral sciences, oral communication, synthesis and global understanding than graduates from other colleges. ICAR graduates reported the lowest levels of competence in information technology, quantitative reasoning and natural sciences.

As would be expected, different *curricular emphases* in the major lead to differences in competence levels across colleges at Mason. CVPA students reported the highest level of competence in the arts; CHSS students felt most competent in literature and western civilization; COS students felt most competent in natural sciences and scientific reasoning; and VIT&E students rated their competence the highest in information technology, ethics in information technology, and quantitative reasoning.

Compared to graduates from other colleges, CEHD students rated themselves the lowest in critical thinking and analysis, global understanding, western civilization, ethics in IT and scientific reasoning; CHHS students reported less competence in synthesis; COS students in written communication and oral communication; and VIT&E students in social and behavioral sciences, literature and the arts.

VI. Self-Reported Competence in the Field of Study

1. Overall Competence

The survey included a set of questions asking about students' abilities and knowledge in their field of study (see Table 4). Students rated themselves very high in these areas. They were most likely to say they were very competent in analyzing work in their field: 48% felt themselves very competent and 49% felt competent. Knowledge of important work in the field was the second highly rated item: 40% of students considered themselves very competent and 57% competent. Over one third of students thought they were very competent in creating original work and conducting original research in the field, another half thought they were competent. No statistically significant difference is found for any of these items between native and transfer students.

Table 4. Knowledge and Abilities in the Field – Self-Reported Competence

	Very competent	Competent	Not very competent	Not at all competent	Mean*
Ability to analyze work in my field	48%	49%	2%	0%	3.45
Knowledge of important work in my field	40%	57%	3%	0%	3.36
Ability to conduct original research in my field	36%	55%	9%	1%	3.25
Ability to create original work in my field	36%	52%	11%	1%	3.24

** Calculated on a 1-4 scale: 4= very competent and 1= not at all competent.*

2. Analyses by College

Students' self-ratings on competence in the field vary by college (see Table 5). **ICAR** students rated themselves higher than students from other colleges for three competencies: knowledge of important work in the field, ability to analyze work in the field, and ability to conduct original research. Graduates from the College of Visual and Performing Arts (CVPA) rated themselves comparatively higher in the ability to create original work in the field than graduates from other colleges. On all four items, COS graduates rated themselves *lower* than their counterparts from other colleges.

The data suggest that some schools/colleges may not emphasize these four competencies to the same degree in their majors. Due to disciplinary differences, we expect to see variations from program to program in emphases on conducting original research and creating original work in the field.

Table 5. Knowledge and Abilities in the Field, by College

	College							
	CVPA	**SOM**	**ICAR**	**CEHD**	**CHHS**	**CHSS**	**COS**	**VIT&E**
	N=163	N=620	N=14	N=75	N=250	N=1484	N=213	N=333
Ability to analyze work in my field	3.50	3.41	**3.71***	3.41	3.40	3.51	3.25	3.46
Knowledge of important work in my field	3.37	3.32	**3.43**	3.41	3.35	3.41	3.22	3.30
Ability to conduct original research in my field	3.39	3.24	**3.69**	3.27	3.07	3.32	2.95	3.24
Ability to create original work in my field	**3.60**	3.16	3.50	3.28	3.06	3.31	2.86	3.22

** The highest mean values are emboldened and the lowest underlined in the table.*

VII. Discussion: What factors affect students' feeling of competence?

Research in education has found multiple and interconnected factors that affect students' feelings of educational growth and competence, including psychological factors, curricular experiences, classroom experiences, co-curricular experiences, and institutional environment. This study focuses on students' curricular experiences: whether they have taken courses at Mason that emphasize each of the 14 general education outcomes and how competent they feel about themselves. The following summarizes major findings from the study:

1. Perceived course emphases affect self-rated competence. When students report that they have taken courses that emphasize certain skills or knowledge, they tend to report growth in those areas. For the 14 general education learning outcomes, students (native and transfers alike) who recalled taking courses at Mason that emphasized a particular learning outcome rated themselves more competent than those who didn't recall or who didn't take such courses at Mason. Most of the time, students who selected "don't know" (a very small percentage of students) rated their competence even lower than those who said they did NOT take related courses at Mason.

2. Students reported high levels of competence in those educational outcomes that are addressed throughout the entire undergraduate curriculum. Among the areas in which students feel most competent are written communication, critical thinking and analysis, oral communication, synthesis, and global understanding. These competencies are addressed throughout the general education curriculum and reinforced in most majors. In contrast, the average competence levels for the arts and natural sciences are the lowest among all 14 outcomes. Students who don't major in the arts or sciences may not take courses emphasizing these areas beyond general education requirements.

3. Average level of self-rated competence varies significantly by college for each of the 14 general education learning outcomes and the four learning outcomes in the major. For some learning outcomes, such variation is expected: graduates from VIT&E should feel more competent in information technology and graduates from CVPA should feel more competent in the arts than their counterparts from other colleges. However, for other outcomes, such as critical thinking and analysis, writing communication, oral communication, synthesis, and, possibly, global understanding, we expect all graduates from Mason to be competent regardless of their field of study. Similarly, we expect comparable competence levels in the ability to analyze work and in the knowledge of important work the field of study (see Table 5). We strongly urge colleges and academic programs to review their

students' perceptions of competence, identify areas of concern, and address these concerns through direct assessment of students' competence and curricular analyses.

As a study of student competence, the survey results have three limitations:

1. The results are based on students' perceptions and self-ratings of competence, not direct measurement of learning.
2. The survey did not measure students' *initial level* of competence before they took related courses at Mason.
3. Although the study clearly shows that students' feeling of competence in a learning outcome is affected by taking courses emphasizing that outcome, we are not sure whether those courses are general education courses or major courses.

For a learning outcomes assessment, direct measurement of student learning is needed to determine students' actual competence. The assessment involves identifying explicit learning outcomes for a course or a program, setting appropriate criteria and standards, systematically gathering and analyzing data (such as student work), and using the results to document and improve a course or a program. Degree programs at Mason, as part of their academic program review, are required to directly measure student competence in programmatic learning goals.

For six general education outcomes (i.e., critical thinking, written communication, oral communication, information technology, quantitative reasoning and scientific reasoning), a "value-added" assessment is being or is about to be implemented in general education courses. A pre-assessment is conducted at the beginning of a general education course/course sequence and a post-assessment is conducted at the end of the course/course sequence. The comparison of pre- and post- results will reveal students' learning as they progress through the general education program. The Office of Institutional Assessment is dedicated to providing guidance and support for faculty and academic programs in learning outcomes assessment.

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