Essential Studies—Thinking and Reasoning

At the core of a liberal arts education is an essential studies curriculum - known to students as their general education requirements. The goal is for students to explore a range of content areas and to develop broad learning abilities as they complete their general education requirements at UND. Students’ general education curriculum should anchor their future university work and provide a model for life-long learning.

The four main areas of UND’s essential studies program are:

• Thinking and Reasoning: Be able to use a variety of thinking and reasoning skills, apply these skills as appropriate in various situations, and move among them depending on purpose.

• Communication: Be able to write and speak in civic, academic, and professional settings with a sense of purpose and audience.

• Information Literacy: Be able to access and evaluate information for effective, efficient, and ethical use in a variety of contexts.

• Diversity: Be able to demonstrate understanding of social-cultural diversity and use that understanding to address issues, solve problems, and shape civic, personal, and professional behavior.

For this edition of Clips, we focus on the first dimension of the essential studies program: thinking and reasoning.

While there is no one survey designed specifically to address the goals of essential studies, a number of questions, distributed across many of the surveys administered by the Office of Institutional Research, do touch on related topics. As a great deal of data is available, this clip focuses on student attitudes and beliefs concerning thinking and reasoning.

Thinking and Reasoning

As stated in the goals of essential studies at UND, “the ability to call on a variety of thinking and reasoning skills and choose among them in order to accomplish a range of civic, professional, and personal tasks is a core hallmark of an educated person.” The goal here is to instill in the students skills in critical thinking, quantitative reasoning, and creative thinking.

Critical Thinking

From UND’s Essential Studies (ES) website:

You will improve your critical thinking skills when your ES courses ask you to do the following:

• Synthesize and analyze texts, issues, or problems.

• Evaluate the logic, validity, and relevance of arguments.

• Come to reasoned conclusions or resolutions to problems that includes foreseeing ethical ramifications of choices, broader implications of actions, and alternative solutions.
According to the 2009 CIRP College Senior Survey, 53.1% of respondents report that compared to when they first entered college, their ability to think critically is “much stronger” now. This is up considerably from 2000 (36.0%) and 2004 (33.7%).

In addition senior students believe that academic departments place a great deal of emphasis on the ability to think critically. In 2008, 32.3% of Graduating Student Survey respondents report their department place “great importance” on the “encouragement of high quality thinking and writing,” while 2.9% report “little” or “no” importance.

Respondents of the 2010 Sophomore Satisfaction Survey, 21.9% report their department placed “great importance,” on the “encouragement of high quality thinking and writing,” while 2.9% report “little” or “no” importance.

Respondents of this survey also believe their UND education contributed to their ability to make choices, logical assumptions, and correct conclusions. When asked “how much of your education at UND contributed to your personal growth in making informed choices,” 45.6% of UND respondents report “very much” while 49.5% report “somewhat” and 4.9% “very little.” Figure 1 displays a breakdown of the years this question has been asked. 2008 had the highest percentage of respondents answering “very much” over all the years displayed.

Further, in response to the question “how much of your education at UND contributed to your personal growth in recognizing assumptions and making logical inferences, and reaching correct conclusions,” 38.2% report “very much” and 45.1% “somewhat.”

Respondents of the Alumni Outcomes Survey feel that “defining and solving problems”, a major dimension of critical thinking, is not only an important aspect of their college career, but also had a considerable impact on them as they went through college. As Figure 2 shows, over 90% of those surveyed feel it was of either a major or moderate importance, while 91% report this dimension as having a major or moderate impact on them.

For more detailed information about any of our surveys, please refer to http://www.und.edu/dept/datacol/reports/surveydesc.html
Critical Thinking (cont’d)

Similarly, 85.8% of Alumni Outcomes Survey respondents feel that “analyzing and drawing conclusions from various types of data” is of either “major” or “moderate” importance, while 80.6% feel it had a “major” or “moderate” impact on them in their school experiences.

Quantitative Reasoning

From UND’s Essential Studies (ES) website:
You will improve your quantitative reasoning skills when your ES courses ask you to do the following:

- Apply empirical data to a special problem or issue.
- Draw conclusions based on quantitative information.
- Analyze graphical information and use it to solve problems.

Freshmen

Forty-six percent of 2009 CIRP Freshman rate themselves as either “above average” or “highest 10%” in mathematical ability. Further, incoming freshman taking the College Student Inventory rated at the 64.9 percentile for Math and Science confidence.

Seniors

Comparing their skills as seniors with when they first entered college, 53.1% of the 2009 CIRP College Senior Survey respondents feel that they were “much stronger” in analytical and problem-solving skills. This is a much higher percentage than 2004 (28.8%) and 2000 (31.0%) respondents. This places UND seniors slightly higher in the “much stronger” response than its public university and 4-year college peer institutions as can be seen in Figure 3.

Creative Thinking

From UND’s Essential Studies (ES) website:
You will improve your creative thinking skills when your ES courses ask you to do the following:

- Explore alternate and potentially divergent perspectives on an idea, process, experience, or object.
- Discover ways to confront complex or ambiguous problems, make new connections, and see how things could be otherwise.
- Engage in creative practice as a means to develop aesthetic understanding.

Creative thinking represents the final dimension of the essential studies’ Thinking and Reasoning goal and UND students, current and former, have offered their opinions on a few key survey items regarding related dimensions of creative thinking.

Figure 3: Comparison of Senior vs. First Entering College in Analytical and Problem Solving Skills

UND seniors also feel relatively strong about their mathematical ability. Slightly less than half (44.9%) of CIRP College Senior Survey respondents rate their ability in mathematics as either “highest 10%” or “above average”, which is slightly less than 2004 (46.9%) and higher than 2000 (34.6%) respondents.

Alumni

2008 UND graduates were a little divided in terms of their education at UND contributing to “understanding/applying math in daily activities.” Slightly more than one-third (36.1%) stated that UND contributed “very much” to this dimension, while 37.9% report “somewhat” and 26.0% “very little.”
**Creative Thinking (cont’d)**

*Freshmen*

Of the incoming freshmen surveyed for the CIRP Freshman survey, 46.3% rate themselves as “above average” or “highest 10%” in creativity compared with the average person of their age. However, creating original works or becoming accomplished in performing arts were not considered highly important aspects for UND freshmen, as 6.3% feel becoming accomplished in performing arts to be “essential” or “very important” while 8.9% feel this way towards writing original works. A slightly higher number of respondents (9.2%) feel this way towards creating artistic work (painting, sculpture, decorating, etc.).

A link between intellectual ability, creative thinking and playing a musical instrument have been the subject of many studies and inquiries at both the academic and popular culture levels of discussion. Slightly less than half (46.1%) of incoming freshmen report playing a musical instrument in the past year, while 20.1% rated themselves as “above average” or “highest 10%” in artistic ability compared with the average person of their age.

*Seniors*

In comparison to freshmen respondents, 60.2% of 2009 UND Seniors rate themselves as “above average” or “highest 10%” in creativity compared with the average person of their age, which is higher than both 2004 (45.5%) and 2000 (45.5%). Also, 20.4% of 2009 UND seniors rate themselves as “highest 10%” or “above average” in artistic ability.

Similar to the freshmen, 7.2% of 2009 UND seniors feel it is “essential” or “very important” to write original works, 11.2% to create artistic work (sculpture, painting, etc.) and 8.1% to become accomplished in performing arts.

Of the 2009 graduates, 57.3% feel that UND contributed “very much” in their ability to approach problems creatively while an additional 35.5% responded with “somewhat.” Figure 4 shows the 5-year trend of this particular survey item.

Also presented in Figure 4 is the dramatic increase in “very much” responses from 2004 (41.9%) to 2008 (57.3%). Further, this is the highest percentage reported in the years presented here. “Very little” responses are at the lowest since 1996 while “somewhat” responses also dropped significantly from 2004.

UND seniors are slightly split on the importance they give to creativity and initiative in their career path after college with 18.6% finding it “essential,” 37.1% “very important” and 38.1% “somewhat important.” UND percentages are lower in “essential” responses than its’ 2009 public university (22.8%) and 2009 4-year college (25.1%) peer institutions. The same is true for “very important” responses: 40.0% for 2009 public universities and 41.4% for 2009 4-year colleges.

In terms of applying creative thinking towards their careers after college, 53.1% of 2009 seniors feel that professors at UND “frequently” provided them an opportunity to apply classroom learning to “real-life” issues while an additional 45.9% report “occasionally.”

*Alumni*

When asked to rate the importance of “developing original ideas and/or products,” 39.4% of respondents of the Alumni Outcomes Survey, report “major importance” while an additional 41.2% report “moderate importance.”

However, when asked about the impact of developing original ideas and/or products only 15.9% report “major impact” and 52.2% report “moderate impact.” Both rated importance and impact is down in “major importance” from 2006 (45.4% importance, 16.2% impact) and 2004 (45.2% importance, 19.1% impact).