INTERDISCIPLINARY LEARNING WORKS:
The Results of a Comprehensive Assessment of Students and Student Learning Outcomes in an Integrative Learning Community

by

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Abstract: This article describes the development, implementation, and results of an extensive assessment of students and student learning outcomes in an interdisciplinary, integrative learning community. This assessment project took a comprehensive view of student learning by examining specific data and direct and indirect measures of academic growth for each learner, from high school GPAs and perceptions about academic preparation upon matriculation, to the development of critical and creative thinking skills while participating in the first-year learning community, to student engagement levels in their senior year. Where applicable, data were compared to data for students who did not participate in the learning community. The results of this panoramic assessment project indicate that interdisciplinary learning and learning community practices are effective

in promoting academic improvement, retention, development of general education skills, and high levels of student engagement and can provide first-year students with an academic edge that follows them through their undergraduate careers. The article further discusses the value of using this type of 360-degree assessment to inform curricular decisions as well as to create institutional support for interdisciplinary, student-centered learning.

Introduction

For decades, the value of learning communities and of interdisciplinary learning has been discussed and documented (Astin, 1993; Dewey, 1938; Jones, 1981; Boix Mansilla, 2004; Kuh, et al., 2005; Pascarella & Terenzini, 1991, 2005; Smith, 1991; Tinto, 2000; Zhao & Kuh, 2004). More recently, in 2008, AAC&U's LEAP initiative published its findings that clearly correlate participation in High-Impact Educational Practices (HIPs), such as involvement in a learning community, with increased student engagement and academic success, calling for "colleges and universities to make participating in high-impact activities a reality -- and a priority -- for every student" (Kuh, 2008, p. 22). A comprehensive programmatic review of the Integrated Studies Program at the University of North Dakota, a 27-year-old interdisciplinary learning community, supports the view that students who participate in such learning experiences gain an academic edge that follows them throughout their undergraduate experience.

The Integrated Studies Program (ISP) at the University of North Dakota (UND) is a long-term learning experiment that has proven the value of fostering critical and creative thinking and engagement through integrative, interdisciplinary learning. Essentially, the Integrated Studies Program was created as a first-year general education learning community that offers students at a public research university the opportunity to take a cluster of four fully integrated general education courses each semester (13 credits) – courses in science, humanities, social science, and communications. The curriculum for these courses is developed and taught by a faculty team and offered in a student-centered learning environment where students engage in active learning projects, primary research, and lively discussions of challenging and pertinent texts. Work and study in the program are organized around a central theme and are carried out in a variety of small group settings in which discussion among students is encouraged. Pedagogically, one of

the most important aspects of the program is that "it consistently attempts to break down the barriers between disciplines and draw together the various disciplinary areas into comprehensive, connective units that demonstrate the relationships between the different fields of knowledge" (Carmichael, 2004). Students can complete one or both of their first-year semesters in the Integrated Studies Program. Understanding the core questions and approaches of each discipline, making connections between disciplinary issues, thinking through the meaning of those connections, and studying the effect of one topic on another, particularly as they relate to topics of personal concern, create a more engaged learner who develops and sustains a curiosity about the world and his or her place in it and is therefore prepared to be more successful in college and beyond (Carmichael, 2005). At the very least, integrative interdisciplinary learning allows students to develop a more holistic view of their world and to better understand the way they each can navigate in it. As Boix Mansilla observes, "preparing young adults to be full participants in contemporary society demands that we foster their capacity to draw on multiple sources of knowledge to build deep understanding" (2004, p. 2).

The value of participating in common intellectual experiences, learning communities, collaborative assignments and projects, and global learning opportunities has been documented (Kuh, 2008), and the history of learning community pedagogy can be traced back to the colonial colleges, which strove to create communities of scholars with common values, to the lyceums of ancient Greece, and even to the ancient Jewish *yeshivot* of Talmudic study, to make the point that "community, where people join in small groups to discuss, explore, and learn together, has existed for centuries as a central concept of learning" (Lenning & Ebbers, 1999, p. 1). The development of contemporary learning communities can be traced back to the theories and experiments of educational pioneers John Dewey, Alexander Meiklejohn, and Joseph Tussman (Carmichael, 2004; Jones, 1981; Lenning & Ebbers, 1999; Matthews, Smith, MacGregor, & Gabelnick, 1997; Price, 2005; Smith, MacGregor, Matthews, & Gabelnick, 2004; Zhao & Kuh, 2004). The Integrated Studies Program at UND has combined the practices of the learning community with an academic approach that integrates interdisciplinary learning, offering students both the support and connection of a community of learners and the academic experience of developing a perspective based on the integration of ideas and information from the humanities, social sciences, sciences, and communications.

Assessment data we have analyzed over the years have indicated in isolated ways that this learning environment and approach have been successful, but we wanted to know more. How can this success be fully understood, and how can the learning outcomes for students in this program

be compared with those of their peers who have participated in traditional university learning experiences? The answers to these questions are important for the continued development of curriculum, assignments, and learning activities and for the promotion of the program's success to administrators and other faculty members at the University. Thus, a multi-layered programmatic assessment plan was developed. This assessment plan utilizes a three-part approach, involving institutional data, direct student learning outcomes, and indirect assessments of student engagement levels to understand

      1. Who are ISP students?

      2. What do ISP students learn?

      3. What are the long-term effects of ISP participation?

This information was analyzed and compared to the data for first-year students who participated in traditional stand-alone courses at UND in order to gain a clear picture of the effects of participation in the ISP interdisciplinary learning community.

Comprehensive Learning Community Assessment: An Overview

Each year, 60 to 80 first-year students matriculating at the University of North Dakota select the Integrated Studies Program and its general education courses instead of the traditional, non-learning-community courses at UND. Any student entering UND is eligible for enrollment in ISP, where there is a "first come, first served" enrollment process. Approximately one-third of students enrolling reserve a space in the learning community ahead of summer orientation (during the students' senior years in high school). They find out about ISP through recruitment efforts (mailings, campus visits, etc.) and by referral. Approximately one-quarter of enrolled ISP students choose ISP due to the recommendation of a friend or family member. The rest of the students learn about ISP during summer orientation and select enrollment at that time. Since the courses in ISP are primarily first- and second-year-level courses, no transfer students select this learning community option.

These enrolled students form a cohort, taking a block of linked courses that integrate humanities, science, social science, and communications around a common theme. The program was modeled on and created with help of faculty from The Evergreen State College and is, thus, a direct descendant of the Meiklejohn-Tussman model (Asbeck, 1993; Carmichael, 2004). Primarily, it features a student-centered learning environment where the curriculum is created by an interdisciplinary team of faculty members who work as fellow-learners alongside the students. The development of skills in critical thinking, discussion, and collaboration is emphasized, and students learn to tackle difficult and complex real-world issues in a cooperative, safe

learning environment where trust is fostered between students and faculty. Faculty help to create this learning community atmosphere by taking students on camping trips, attending cultural events with them, and utilizing student discussion seminars as a main feature of the classroom experience (Carmichael, 2004). By exploring the differences and similarities between these students as entering freshmen and their peers, by studying their learning outcomes throughout the year, and by comparing their academic success and levels of engagement as they move beyond the learning community, ISP faculty have gained a true picture of the effectiveness of this interdisciplinary learning community experience.

To gather this information, the following timeline was established:

- Fall and Spring, 2012-13: Gather direct student learning artifacts from current students;
- Spring 2013: Finalize assessment rubric;
- Summer 2013: Gather institutional data: student demographics, high school GPAs, Cooperative Institutional Research Program (CIRP) data, National Survey of Student Engagement (NSSE) data;
- Fall 2013: Norm assessment rubric (faculty);
- Fall 2013: Apply rubric to student learning artifacts and analyze data.

The assessment director gathered the information and led the norming sessions (described later). Data analysis was provided both by the assessment director and by UND's Office of Institutional Research. (Institutional Review Board permission for this study had been obtained.)

Institutional data were collected from the past five years to provide the most up-to-date portrait of the current ISP student and give the most accurate information for comparison with non-ISP students. Additionally, analyzing data over a five-year period, where appropriate, provided a sense of continuity or trends in characteristics.

The data collected and analyzed were applied to address the three questions guiding the program review to better understand who ISP students are, what ISP students learn, and what the long-term effects of ISP on student learning and engagement are. Since several key campus-wide surveys were found to be essential to this study (especially the NSSE), it was determined that this study would take place every three years in concert with the collection of data from those instruments.

Who Are Integrated Studies Program Students?

To understand the impact of participation in this interdisciplinary learning community, first the similarities and differences between the students and their peers at UND must be understood. To determine who ISP

students are when entering ISP, five years' worth of institutional data were analyzed, specifically information on gender, hometown, high school grade point average, and self-reported CIRP data that provide metrics on students' high school experiences and academic expectations in college. Some information from these data is also important for determining the level of academic success that can be expected from students in their undergraduate career (Pasque & Murphy, 2005; Shapiro & Levin, 1999; Smith, 1991).

After faculty analyzed and compared the data, the following portrait of ISP students emerged:

- **Demographics**: Like their peers at the University of North Dakota, incoming first-year students in the Integrated Studies Program over the past five years tend to be approximately 18 years old, from the same mix of public and private institutions, primarily from North Dakota and Minnesota, and of the same gender mix (slightly more heavily female than male). However, unlike their peers' grade point averages, ISP students' high school grade point averages tend to be lower, with ISP students' average at 3.30 on a 4-point scale and non-ISP students' average at 3.38.
- **Perceptions of Learning/Academic Preparation:** According to CIRP data gathered from surveys completed by incoming first-year students and most recently processed at UND in 2011, ISP students demonstrate the following in comparison to their peers also entering UND in that same year. Thirty-five ISP students were surveyed. Statistical significance was determined using a t-test. Indicators were determined significantly different at $p<.01$:

CIRP Metrics	ISP Students	Non-ISP Students
Completion of College-Prep Math Courses	Pre-Calc: 48%* Calculus: 0%* AP Calc: 5%*	Pre-Calc: 75% Calculus: 23% AP Calc: 18%
Self-Perceptions of Math Abilities (Likert Scale where 1= Not able, 4=Very able)	2.6*	3.5
Self-Perceptions of Academic Abilities (Likert Scale where 1= Not able, 4=Very able)	3.2*	3.8

Plans to Obtain Bachelor's Degree (Likert Scale: 1=No chance, 4=Very good chance)	19%*	42%
Plans to Obtain Graduate Degree (Likert Scale: 1=No chance, 4=Very good chance)	9%*	31%
Important Personal Goal: Develop Meaningful Philosophy of Life (Likert Scale where 1=Not important, 4=Essential)	2.5*	2.0
Important Personal Goal: Influencing Social Value (Likert Scale where 1=Not important, 4=Essential)	2.5*	2.0
Important Personal Goal: Study Abroad (Likert Scale where 1=Not important, 4=Essential)	2.8*	2.0
Future Plans: Plans to Change Major (Likert Scale: 1=No chance, 4=Very good chance)	2.8*	2.4
Future Plans: Plans to Change Career Choice (Likert Scale: 1=No chance, 4=Very good chance)	3.0*	2.4

*Demonstrates Statistically Significant Difference

Discussion and Limitations:

Overall, incoming ISP students match the same age, gender, and regional demographics as non-ISP students at UND, but they tend to have lower high school grade point averages than non-ISP students, are less well-prepared for college-level courses, and have a lower sense of academic ability, particularly in mathematics. A noteworthy difference indicated in these data is the great disparity in ISP students' self-reported plans to complete a Bachelor's degree (only 19%) compared to their non-ISP peers' belief that they would complete that degree (42%). This information would seem to indicate that students enrolling in ISP have a less clear vision of their academic goals and less confidence in their abilities to complete college or both. Thus ISP may

be serving a population of students who may be at great risk of not being retained by the institution but who, studies report, are especially well-served by participating in high-impact practices, where the "salutary effects are even greater for students who begin college at lower achievement levels" (Kuh, 2008, p. 19).

As in the data from any self-reported survey, the degree of certainty over outcomes is somewhat compromised by user perceptions and misunderstandings. However, the overall sample size of ISP and non-ISP students was robust, which should correct for many of these inaccuracies. Participation in the CIRP survey is voluntary, so that data would be affected by outside influences on students' choices to complete the survey; however, 50 percent of the incoming ISP cohort did complete this survey. Additionally, some responses to questions, such as the one addressing students' goals for completing a Bachelor's degree, might be compromised as some students may not understand the term "Bachelor's degree." However, many of these data are simply reported, factual data (such as high school GPA), which would be more reliable.

What Do Integrated Studies Students Learn?

Integrated learning, of which interdisciplinarity is a subset (Larder & Malnarich, 2009, p. 32), "posits that truth is not the *act* of ultimately establishing knowledge, but rather the *activity* of its provisional progress" (Welch, 2011, p. 3). By being exposed to the ways that different disciplines consider an issue and by learning to compare the different approaches of those disciplines, students can begin to form a more complete and meaningful perspective and make more informed decisions. Additionally, integrating ideas from multiple disciplines helps students create a context for their own learning. Integrating ideas in an interdisciplinary learning environment more accurately reproduces a real world environment where individuals take in various pieces of information from interdisciplinary sources and combine or integrate them in different ways to reach conclusions.

To guide students through this activity of integrating information and ideas from multiple disciplines, faculty members introduce students in the University of North Dakota's Integrated Studies Program to four specific learning goals:

1. To learn to compare ideas to consider alternative ways of thinking;
2. To synthesize and make connections between ideas and topics and to advance new ideas as a result;
3. To analyze topics in-depth and use findings to formulate new concepts or reach new conclusions;

4.   To connect and integrate ideas across disciplines in order to posit new or alternative ideas or explanations.

The careful development of these goals by ISP faculty was guided by ongoing feedback gathered from the assessment process developed by Boix Mansilla for evaluating integrative work (Boix Mansilla, 2004, 2007). Assignments incorporate these goals, and student work is assessed according to them. It is essential to any assessment experience to establish and articulate to students clear learning goals against which they are continually evaluated.

To make learning gains in these areas, students participate over the semester in a series of readings, intentionally integrative assignments, and intense discussions, where they are asked to consider the way knowledge is acquired in the disciplinary areas of humanities, social science, science, and communications. They are asked to consider and interact with primary and secondary texts or materials in these disciplines in order to practice and develop critical and creative thinking, and then they are asked to bring the information from those disciplines together and to consider where ideas in each area brush up naturally, and sometimes even not so naturally, against each other. They are asked to compare and contrast these ideas and to discuss the ways in which the various pieces of information support or contradict the other pieces. Finally, they are asked to consider new ideas or information that may come to light after they have connected, compared, and contrasted these interdisciplinary perspectives and to work toward new conclusions that emerge in the process of these considerations. This work of integration, of combining or connecting topics and ideas across disciplines and applying conclusions drawn from that work to new situations, allows students to see the natural progression of idea development. It becomes an "effective strategy for comprehending, navigating, and transforming knowledge" (Welch, 2011, p. 2).

Work in ISP classes involves a great deal of oral processing through seminar discussions and oral exams. Students are expected to hone their intellectual skills by responding to and discussing integrative questions and topics within a learning community setting. Since the goal of assessment is to provide an authentic look at students' direct learning process, faculty members decided to analyze that learning in its organic setting. The seminar style of ISP classes, it was felt, provides the best setting for this data collection. Therefore, to monitor students' learning, a series of authentic assessment activities have been put in place throughout each semester. Called "checkpoints," these experiences require that students read and prepare a significant document or book and participate in an intense oral discussion of that work with three fellow students for 40 minutes without faculty participation until the end of the checkpoint exam. For instance, after study

and discussion of the *U.S. Constitution*, articles on genetics and genetic testing, and philosophical debates on what it means to be human, students might be assigned a text like *The Immortal Life of Henrietta Lacks* (Skloot, 2010). It would be their job to read and prepare this text for discussion in light of their recent work in the three disciplinary areas of social science, science, and humanities (philosophy).

Four of these checkpoint experiences are scheduled over the course of the semester. Students self select into groups of four a week ahead of the checkpoint and are given the text they will be responsible for preparing and discussing. They are encouraged to meet together ahead of time to study and discuss the new work, and they are given copies of the rubric that will be used to evaluate them. Of course, they have also been presented with the overall learning goals of the program. During the checkpoint, students engage in a discussion of the work without feedback, input, or assistance from faculty. They have experienced seminar discussions with their classmates in groups of 10 to 20, with faculty interaction and facilitation. However, in a checkpoint experience, the discussion becomes much more intense and is guided entirely by the students in the group. The level of the preparation and of their previous engagement in the work they have done throughout the semester in ISP will have a clear effect on their performance in this situation. In the final 10 to 15 minutes of the checkpoint, faculty will select an idea or topic that the students have brought forward and ask them to go back to that topic and discuss it in more detail. This provides an opportunity for groups to dig more deeply into an important idea they may have disregarded too quickly. This also gives faculty a chance to ask group members to address important ideas they have missed entirely. For instance, they may have shaped a discussion that integrates social science and humanities but doesn't include science. A faculty-directed question at the end gives them a chance to try to do this. They may fail or they may succeed, but either way the faculty member gets a sense of the level of their integration ability.

Faculty monitor the checkpoint and record the types of student responses according to the following rubric, developed over several years with some guidance from the Association of American Colleges and Universities' guidelines for assessing critical thinking and integration (AAC&U, 2010). This rubric also contains assessment points for topics other than critical and creative thinking and integration, providing faculty and students with information on a student's progress in other key areas for academic success including text preparation, listening, and overall participation:

Student Evaluation/Checkpoint Rubric, Integrated Studies Program

Basic Skills	Level 1 Inactive	Emerging	Level 2 Exploratory	Emerging	Level 3 Integrative/ Insightful
Preparing Materials	Little evidence of text preparation		Evidence of text preparation		Evidence of more than just text preparation
Participation	Little participation		General observations on assigned materials		Active/specific participation using assigned texts and other materials
Personal Relevance	No evidence of connecting materials to personal experiences		Makes multiple connections to personal experiences/ may not advance discussion or be relevant		Connections between material and personal experiences are relevant and advance discussion/ analysis
Using Texts/ Materials	Few references to assigned text or course materials		Multiple, general references to assigned text and course materials		Multiple/ significant specific references to assigned text and course materials
Listening	Distracted/ unengaged		Listens to others, may respond		Listens and responds to others in meaningful ways

Comparing Ideas	Few comparisons made		Some general/ evident comparisons made between ideas, texts, experiences		Multiple comparisons made between texts, ideas, experiences; some may verge on insightful
Advanced Skills	**Level 1**	**Emerging**	**Level 2**	**Emerging**	**Level 3**
Connecting/ Integrating	No connections across disciplines		Occasional, observational connections across disciplines; may notice contrasts		Frequent and/ or thoughtful connections across disciplines; notes contrasts
Extending Discussions	Little extension of others' comments		Begins to explore others' comments; does more than agree/disagree		Considers others' comments and works to integrate those ideas with other discussed issues/texts
Synthesizing/ Projecting	Does not attempt to synthesize ideas		Explores conflicting info/ ideas and works to synthesize differences		Synthesizes conflicting info/ ideas and introduces new topic as a result
Analyzing/ Applying	Little or no exploration of topic or text or drawing of larger conclusions		General/ surface exploration of topic/ text; begins to reach larger conclusions		Explores topics in-depth and uses findings to draw conclusions/ formulate new insights

(Carmichael, LaPierre, Magness, 2012).

Responses on this rubric are recorded and transferred to a Likert scale where 1=Inactive, 2=Emerging to Exploratory, 3=Exploratory, 4=Emerging to Integrative/Insightful, and 5=Integrative/Insightful. All faculty members

using this rubric underwent norming sessions to assure inter-rater reliability using two student checkpoint seminars that were videotaped with permission of the student groups. All five faculty who assessed checkpoint experiences with the rubric watched the videos, recorded their assessments, and compared the results. A discussion of any discrepancies followed and all were resolved. In addition, an outside expert in this style of learning also watched and assessed the videos. Comparisons with the group results were made, and the instrument was found to be reliable.

Following these norming sessions, each faculty member applied the rubric to four sets of his or her own checkpoints -- two from fall semester checkpoints and two from spring semester checkpoints. In both cases, the first and final checkpoints were used to determine significant differences in the amount of learning across a semester. Random samples of rubrics from all faculty were selected for analysis and results were averaged. Assessments for the same students were used from both the first and final checkpoint assessments in each semester. Since this was the pilot test of the instrument, only 12 samples were selected each semester. In further assessment work, the sample selection will be increased to at least 20. Random selection was carried out by an outside staff member. The student cohort assessed here is the same cohort for whom demographic and CIRP data were collected and analyzed as described in the previous section. Students can complete one or both semesters of their first year by enrolling in the integrated block of 13 ISP credits each semester; therefore, in order to assess only students who had been enrolled in ISP courses for their entire first year, in the second semester only data from returning students were used.[1] A paired *t*-test two-tailed Fall 1 vs. Fall 4 was conducted to determine significance of difference. This is the first year that a complete set of data has been collected and assessed. In subsequent years, faculty members will need to compare data across the years to see what trends emerge. This is the intention of the assessment plan.

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[1] Because many students who start in the fall choose to pursue other academic opportunities at UND in the spring semester (such as beginning courses for their major), a smaller group of students enters the spring semester in ISP (approximately two-thirds of the original fall coh ort). Students choose to leave ISP after one semester for varying reasons each year; currently more than 80 percent of those leaving report on an exit survey that they are not continuing due to the need to "take required courses in the major." This attrition could result in lower or higher second semester averages depending on the academic strength of students continuing.

Following are the results for the assessment areas pertaining to critical and creative thinking and interdisciplinary integration:

	Comparing Ideas	Synthesizing/ Projecting	Analyzing/ Applying	Connecting/ Integrating
Semester 1: First Checkpoint (September)	2.0	1.25	1.25	1.25
Final Checkpoint (December)	3.92*	3.88*	4.29*	4.17*
Semester 2: First Checkpoint (February)	4.41	3.87	4.24	4.17
Final Checkpoint (May)	4.42	3.96	4.25	4.17

Semester 1, n=12; $p < 0.05$ Semester 2, n=12;
Likert scale: 1=Inactive, 2=Emerging to Exploratory, 3=Exploratory, 4=Emerging to Integrative/Insightful and 5=Integrative/Insightful.
*Fall Checkpoint results demonstrate significant difference.

Discussion and Limitations:

Checkpoint experiences begin after the first quarter of the fall semester; therefore, students are being assessed after they have gained experience in reading and discussing texts and ideas at the college level. They have also studied various theories on logic and on logical fallacies and have watched other academics debate or discuss ideas in the classroom or on the Internet, via forums like TED talks. Additionally, they have been exposed to the ways of thinking in four broad disciplinary areas: humanities, social science, science, and communications. Thus, assessment begins after students have begun to gain some experience in the areas in which they are being assessed. It is hoped that, to some degree, this creates a more level playing field between students who come in with varying degrees of experience in reading, discussion, and analysis. Additionally, it gives the learning community time to form, creating

that safe space for discussion that is essential to successful student participation (Light, 2001; Ullah & Wilson, 2007; Yazedjian, et al., 2008). Since these data sets indicate learning outcomes over only two semesters of students' first year of college, the expectation is not that they should be achieving a level of mastery (4-5) but that they should show growth in most areas over time.

Direct assessment of student learning seems to indicate that students, overall, gain significantly in all areas of thinking and integration development, with the greatest gains occurring between the first and final checkpoint in the fall semester. Those gains are maintained and slightly increased by the final checkpoint in the spring semester, though not significantly. These findings corroborate the value of creating learning opportunities through interdisciplinary education (Boix Mansilla, 2004; Field & Stowe, 2002; Newell, 1998). It does appear that students are naturally more able to compare ideas than to integrate and analyze ideas across disciplines, which is expected since integration involves comparison, synthesis, and extension of ideas, making it more complex and difficult to master. Most students would have experience in high school classes with idea comparison and contrast but probably would not have been required to compare information across different disciplines in order to see patterns or reach new conclusions. Unfortunately, too often at the college level, opportunities for cross-disciplinary comparisons, and thus eventually integrative thinking, are not provided to students. The Integrated Studies Program at UND does provide such opportunities and, in fact, challenges students to be integrative in their thinking and reasoning, and the learning outcomes reflect the educational benefit of this experience. Synthesizing and integrating both remain the categories of lowest growth, but since these two areas require the greatest sophistication in abstract thinking, it is not unexpected to see lower scores for first year students despite their exposure to this type of thinking and learning.

It is noted that there is not a significant difference in learning outcomes from checkpoint one to the final checkpoint in the spring semester, though levels are maintained. This finding has been recognized by the faculty team and is under discussion. It may be that students are operating at their capacities for their developmental level, or it may be that they are not being challenged in the second semester in ways that could give them opportunities to further develop their thinking and integration skills. As stated, this pilot study is only in its first year. Continuing to assess students in the same way and to compare data across academic years will help yield more accurate and informative results and will help faculty determine how best to shape the learning practices in the spring semester.

What Are Some Long-Term Effects of Participation in the Integrated Studies Program?

As all of the previous studies referenced indicate, data for multiple decades have pointed to the benefits of student involvement in both interdisciplinary learning and high-impact practices like learning communities. But what, specifically, can be said about the long-term effects of participating in an interdisciplinary learning community as ISP students do versus their non-ISP peers? Discovering this information becomes essential as programs like ISP must increasingly argue for their institutional value as they vie for needed internal and external funding (Carmichael, 2005; Dickeson & Ikenberry, 2010; Field & Stowe, 2002; Kuh, 2008; Vescio, 2008). Additionally, and most importantly, discovering the long-term effects of participation in ISP will help that department better understand the strengths and weaknesses of the curriculum, pedagogy, and learning community practices and to adjust them as need be.

To determine the long-term results of ISP participation, three sets of external data were collected and analyzed:

- First semester GPAs (2008-2012);
- Fall-to-fall retention rates (2008-2011);
- National Survey of Student Engagement (NSSE) data for first- and fourth-year students (2009, 2011).

These particular metrics were chosen because of the strong evidence that these data sets can articulate correlations between outcomes and academic success. First semester GPAs have long been found to give the first indication of continued success in college (Krumrei-Mancuso, et al., 2013; McPherson & Schapiro, 2008). Retention rates are important to the value of a department or program as it makes arguments for its validity and for continued funding. And, of course, students can only be successful at an institution if they are retained and continue that education. The National Survey of Student Engagement (NSSE) is the best known national project for measuring the extent to which students engage in practices that have been linked with positive learning outcomes, personal development, student satisfaction, and academic persistence. The recent work of many scholars (Astin, 1993; Pascarella & Terenzini , 1991, 2005; Kuh, Cruse, Shoup, Kinzie, & Gonyea, 2008) indicates that students who are actively engaged in academic and co-curricular activities gain more from their college

experience and are more academically successful than students who are not as engaged.

First Semester GPAs 2008-2012 Average

Grade point averages were averaged over five years for both ISP and non-ISP students and Welch's *t*-test was used to determine significant difference. This analysis indicates that at the end of the first semester, despite the lower entering high school GPAs, ISP students had a statistically significantly higher GPA.

Group	N	Mean GPA	Std. Dev.
ISP	362	3.08*	0.813
Non ISP	9,979	2.80	0.957

* = significant difference, $p<0.05$

Fall-to-Fall Retention 2008-2011

Retention rates from first to second year were factored over six years and show little significant difference between ISP and non-ISP students. This finding is important to ISP, however, when it is viewed through the original data indicating that only 19 percent of entering ISP students believed they would continue on in college to finish a Bachelor's degree, compared to 42 percent of their non-ISP peers who believed they would finish that degree.

Year	ISP Retention Rate	Non-ISP Retention Rate
2006	81%	75%
2007	74%	78%
2008	77%	77%
2009	73%	79%
2010	75%	77%
2011	79%	74%
Average Retention Rates	76.5%	76.6%

NSSE Benchmarks 2009 and 2011

The NSSE establishes five benchmarks of desirable educational practices, based on Astin's (1984) theory of student involvement and Chickering and Gamson's (1987) work, and surveys ask students to respond to sets of questions intended to provide insight into these benchmark areas. The five benchmarks are level of academic challenge (LAC), active and collaborative learning (ACL), student-faculty interaction (SFI), enriching educational experiences (EEE), and supportive campus environments (SCE). First-year and senior students at UND were anonymously surveyed. The data for ISP students were pulled out and compared with those for the non-ISP students. In order to determine whether ISP students reported higher levels of engagement than their non-ISP peers, an independent samples t-test was conducted to compare the means of the two samples of students for significant differences between the two groups of students. Results were analyzed for a pattern that could help explain any significant differences found.

First-Year Students 2009

Benchmark	ISP Mean (bold is >non ISP)	Non-ISP Mean
LAC	**63.1***	51.5
ACL	**55.1***	39.4
SFI	**38.2**	31.0
EEE	**31.3***	22.8
SCE	**64.4**	60.9

ISP n=14 non-ISP n=514; $p<.05$ raw scores, non-weighted
*= significant difference determined

First-Year Students 2011

Benchmark	ISP Mean (bold is >non ISP)	Non-ISP Mean
LAC	**61.5***	52.4
ACL	**53.0***	40.8
SFI	**37.4**	32.8
EEE	**26.4**	24.8

SCE	**62.6**	61.5

ISP n= 23 non-ISP n= 525; *p*<.05 raw scores, non-weighted
*= significant difference determined

Senior Students 2009

Benchmark	ISP Mean (bold is >non ISP)	Non-ISP Mean
LAC	**61.3**	55.6
ACL	**51.0**	50.1
SFI	**52.5**	45.7
EEE	**52.5***	37.2
SCE	**60.5**	55.6

ISP n=10 non-ISP n=415; *p*<.05 raw scores, non-weighted
*= significant difference determined

Senior Students 2011

Benchmark	ISP Mean (bold is >non ISP)	Non-ISP Mean
LAC	**65.0***	55.0
ACL	**57.2**	47.3
SFI	**60.0***	39.8
EEE	**58.0***	35.8
SCE	**59.9**	57.2

ISP n=12 non-ISP n=783; *p*<.05; raw scores, non-weighted
* = significant difference determined

Discussion and Limitations:

First-year students who participated in the Integrated Studies Program learning community scored higher than their non-ISP peers on all five benchmarks of the NSSE in both first and senior years in both the 2009 and the 2011 survey. This persistence of ISP students out-scoring non-ISP students indicates a consistent pattern of increased engagement over

multiple years and over the academic journey of students from first to senior years. The mean differences were found to be statistically significant for LAC, ACL, and EEE in the 2009 cohort and for LAC and ACL in 2011. In the senior year group, mean differences were found to be statistically significant for EEE in 2009 and for SFI and EEE in 2011.

These studies seem to corroborate previous research on the positive effects of participating in learning communities and on the positive impact of interdisciplinary curriculum (Newell, 2008). The Integrated Studies Program, like most learning communities discussed in the literature, incorporates active and collaborative learning activities, critical and creative thinking skills development, high levels of student-faculty interactions, and continuous exposure to interdisciplinary thinking and collaboration. These educational activities, which are all linked to higher levels of engagement, are reflected in the higher NSSE scores of ISP students. And though NSSE does not directly assess learning outcomes, Umback and Wawrzynski argue, based on their review of the literature, that "if educational practices lead to student engagement and student engagement leads to certain outcomes of college (e.g., student learning and retention) then it can be said that educational practices indirectly lead to student outcomes from higher education" (2004, p.156). Certainly the higher levels of engagement reported here are consistent with the on-average significantly higher GPAs reported and the higher-than expected rates of retention from first to second year. Combining the results of direct assessment of student learning with indirect student self-assessment of learning allows for a clearer picture of the effectiveness of an interdisciplinary learning program like Integrated Studies. Being able to corroborate faculty observations and student self-reported data with direct learning outcomes greatly strengthens arguments for the value of these kinds of high impact practices.

Plans for Further Study and Development

Though ISP faculty have conducted meticulous and ongoing assessments of student learning over the 27 years the Program has existed, this is the first time a complete 360-degree assessment of students and their learning outcomes has been conducted. In some sense, then, this assessment is both a pilot and a baseline that requires further similar assessment so that trends over time can be studied. ISP faculty intend to collect direct learning data each semester as described in the section on checkpoints. Increasing the sample sizes, now that the validity of the rubric and raters has been established, will provide more robust results that can be used to make yearly curriculum decisions. These data will also provide yearly comparisons so that

faculty can see if and when a group seems to be below or above the recorded averages. Already, other departments and programs on campus are looking to this new model established for ISP to create similar ways of studying and documenting their student populations, their learning outcomes, and their ongoing academic achievements.

The demographic information and CIRP data for ISP vs. non-ISP students will be collected annually to provide an immediate sketch of who entering students are and what their strengths and limitations might be. NSSE data will be analyzed each time they are available, and in these "NSSE years," complete reports, like this one, will be compiled. Thus, every two years, a complete 360-degree review of students and of student learning outcomes will be articulated.

Providing long-term records of this kind of information will help less-traditional units that emphasize interdisciplinarity, competencies-based outcomes, and student-centered teaching and learning articulate their value to the more traditional, research-based college or university and should allow these types of units to vie for resources and for prominence in any prioritization processes.

Conclusion

Recent major criticism of undergraduate education in the United States claims that "colleges and universities have failed to focus on undergraduate education and student learning in particular" (Ullah & Wilson, 2007, p. 174). A recent nation-wide study of the undergraduate education system proclaims, "four-year colleges and universities and students attending them are too often 'academically adrift,'" reflecting a sharp decline in academic work effort and learning from earlier decades (Arum & Roksa, 2011, p. 30). More specifically, the authors of the study found that gains in critical thinking, complex reasoning, and writing skills were either exceedingly small or statistically nonexistent for many students, and 36 percent of students experienced no significant improvement in learning over four years of college (Arum & Roksa, 2011). Back in 1987, Chickering and Gamson characterized undergraduate education as a "spectator sport" (p. 5). According to Tinto (2000), the college experience for many U.S. students still remains very much the "spectator sport" Chickering and Gamson described it as being in which "students do not learn much just by sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers" (p. 5). In his analysis of nation-wide NSSE data, Kuh (2003) reported that about one-fifth of both first-year students and seniors "frequently" come to class unprepared and say their institutions place

little emphasis on studying and spending time on academic work. These disengaged students put very little effort into their studies and report making very little progress toward desired outcomes in college (p. 27).

Though there is not a single prescription for the ills that beset undergraduate education and its disengaged students, it is argued that "there is growing evidence that--when well done--a handful of selected programs and activities appear to engage participants at levels that boost their performance across a variety of education activities and desired outcomes" (NSSE *Annual Report*, 2007, p. 7). Two of these select programs or methods are learning communities and interdisciplinary learning (Zhao & Kuh, 2004). However, thus far much of the evidence that supports the belief that these methods are effective has been qualitative and anecdotal. Now, the information from this extensive, panoramic study of students in UND's interdisciplinary learning community provides a solid foundation of support for these claims, based on quantifiable data gathered in a rigorous and reliable assessment process that measured student learning outcomes and engagement levels over time. The results clearly indicate that interdisciplinary learning and learning community practices are effective in promoting academic improvement, retention, development of general education skills, and high levels of student engagement.

Beyond that, creating a comprehensive assessment process that takes into account student data from the beginning of their college experience, through their participation in the interdisciplinary learning community of ISP, beyond ISP, and into their senior year, allows a more developed portrait to be painted of the students who pursue this interdisciplinary learning community experience and their peers who do not. It helps the faculty of such a learning community to better understand whom they serve, so that learning can be tailored to fit the needs of the students, and it helps those faculty members to argue to a larger community for the value of the learning experience they provide. Comparing ISP and non-ISP students in terms of direct assessment of student learning and indirect assessment of students' perceptions of learning and engagement allows faculty to answer confidently the question of whether participating in this type of interdisciplinary learning community has long-term major impacts. And it can suggest how non-ISP courses might take advantage of successful ISP practices. Creating such an extensive analysis of student learning, including both direct and indirect assessment, can provide the faculty of any interdisciplinary learning community with a clear picture of the positive effects of integrative, student-centered learning and will provide that unit with the tools it needs to move successfully into the future and to positively impact student learning in new and more comprehensive ways.

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