

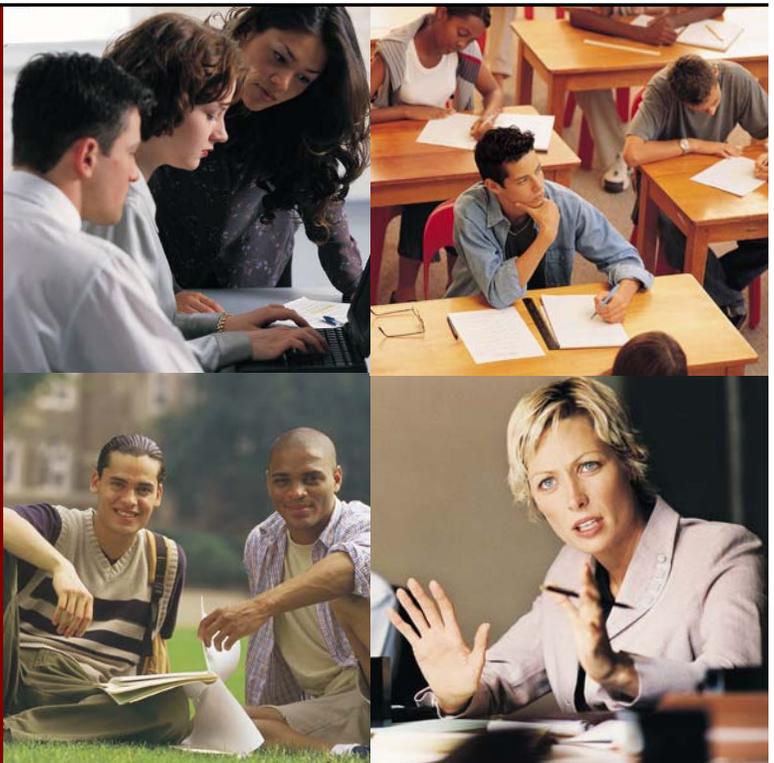


External Evaluation Report for the Bush Foundation Grant Year 2

Submitted by:



January 30, 2006



EXTERNAL EVALUATION REPORT FOR THE BUSH FOUNDATION GRANT Year 2

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Executive Summary

EXECUTIVE SUMMARY

Through two three-year grants beginning in March 2001, the Bush Foundation has supported an initiative to enhance student learning on the four University of Minnesota campuses—Crookston, Duluth, Morris, and Twin Cities—by fostering the development of faculty skills for integrating innovative teaching practices.

Through the 2005-2007 grant, the four campuses proposed three goals to unite their efforts and design specific program activities aligning grant efforts with current campus initiatives to keep student learning in the forefront; fostering a scholarly and collaborative approach to addressing student learning issues; and integrating the assessment and evaluation of student learning initiatives into the campus mainstream. Currently, the University is at the end of Year 2 for the second three-year grant.

Evaluation

The external evaluation was designed to fulfill data needs that go across campuses, and to answer questions that are of common interest. For the purposes of mainstreaming the evaluation, a coordinating team was established with members responsible for ensuring that data were collected for multiple levels of the evaluation. The external evaluator for this project is MGT of America, Inc.

Evaluation Approach

An evaluation plan was developed that would ensure that qualitative and quantitative data were collected and analyzed to measure the impact of the grant on student learning in relation to the aforementioned goals.

Evaluation Procedures and Documentation Tools

Several different data gathering techniques and documentation tools were employed during Year 2, including a faculty survey, focus groups and interviews, and course profiles. Information on each of these data collection instruments and procedures are detailed in Chapter 2.0 of this report, and copies are included in Appendix B. Additional data beyond what was gathered through these instruments were collected as needed. Data were assimilated and analyzed to evaluate progress in addressing the goals of the grant, using the Statistical Package for the Social Sciences (SPSS) software where applicable. These data are reported in Chapter 3.0 of this report.

Evaluation Summary and Highlights of Campus Participation

Through analysis of the data that has been collected thus far, MGT conducted a comprehensive review and analysis of the implementation of the Bush Foundation Grant on each campus and systemwide by focusing on the progress made in Years 1 and 2 towards meeting the goals of the grant. Supporting documentation for the sections below may be found in Chapter 3.0 and the appendices of this report.

Alignment of Grant Efforts with Current Campus Initiatives

All campuses met or exceeded their goals for engaging the desired number of instructional staff and students in grant-related projects, and expectations for the number and types of courses involved. Evaluation data collected from interviews with faculty and course profiles revealed that the four campuses have inspired faculty participants to directly relate their research for the Bush continuation grant to the strategic campus initiatives under way on their campuses. Bush grant research is impacting a total of 50 faculty and an average of 5,260 students per semester.

Fostering a Scholarly and Collaborative Approach to Learning

Survey data revealed that faculty viewed a scholarly and collaborative approach to teaching as important. Survey questions regarding collaboration were grouped into the following categories—collaborating with students for the purpose of learning, collaborating with students to inform course redesign, and collaboration with colleagues. Based on the survey data, faculty gave a higher priority to collaborating with students for the purpose of learning, and the lowest priority to collaborating with colleagues.

With regard to scholarship, faculty gave the highest priority to updating their knowledge of their discipline followed by participating in conference, seminars, or workshops on teaching or student learning, and using interdisciplinary knowledge to inform their course design.

There has been little change in faculty's attitude towards using a collaborative and scholarly approach to teaching over the first two years of the grant. However, it is important to note that the faculty viewed collaboration and scholarship in teaching as important from the beginning, so little change was anticipated. In some instances, faculty perceptions were not as high in Year 2 as they were in Year 1.

Based upon survey results, information submitted in course profiles, and interviews conducted with consultants, faculty, and students, it would appear that various modes of collaboration and scholarship have played prominent roles in grant proceedings across the system. Regarding collaboration, while some inconsistencies in definitions or understanding still exist, and some gaps in opportunities were cited by participating faculty, it is evident that all grant participants have seen an increase in experiences working with others as part of the development, implementation, and assessment and evaluation stages of their grant work. Additionally, understandings of the scholarship of teaching among participants has evolved substantially, with some faculty gaining their first introduction to the concept, while others have significantly advanced their understandings of how to employ the ideals of scholarship in refining their teaching methodologies as well as disseminating their findings to others in their fields. Increased appreciation for both of these aspects of the grant—collaboration and scholarship—is apparent among almost all participants.

Assessment and Evaluation of Student Learning

Survey data revealed that faculty used graded or quantitative methods (quizzes, tests, etc.) to assess student learning more than qualitative methods (journals, reflection papers, essays, etc.). Similarly, required measures of performance were used to assess

learning more than voluntary measures. Faculty were also more prone to assess students based on individual performance rather than outcomes from groups. Data collected from faculty interviews and focus groups confirmed the aforementioned survey results.

Additionally, faculty felt that motivating students to improve study skills, using classroom assessment to prompt student thinking, and understanding what the class (as a group) is learning were the most important thrusts for improving student learning. Faculty believed that collecting entry-level knowledge, identifying students who need extra help, and helping students assess their own progress were the least important.

Site visit interviews and focus groups revealed some progress in terms of courses being redesigned based on results of assessment and evaluation efforts. Many faculty had not yet processed the data for the current year's projects, however, so these refinements had not yet been applied on a universal scale. A limited number of faculty seem to disregard the value of assessment and evaluation beyond informal or minimal qualitative feedback received from students.

Faculty Professional Development Opportunities

Campus coordinators and faculty systemwide reported numerous opportunities for development associated with the grant that extended to and benefited a large number of faculty beyond those conducting grant-funded research. Most faculty expressed appreciation of the content of these programs, while most or all faculty also greatly valued the opportunities to meet and share ideas with other faculty with whom they did not typically associate. Faculty said that opportunities to meet with colleagues were valuable, despite seemingly divergent research topics.

Faculty mentioned that scholarly materials were frequently distributed and discussed at group or team meetings/workshops. Additionally, faculty shared articles and other scholarship of joint interest with one another. Campus coordinators assisted participants in their efforts to publish and present findings from their research. Group meetings allowed for smaller group discussions and stimulated individual conversations to promote collaboration. Breeze sessions initiated some conversations between faculty at various campuses that helped to refine methodologies and efforts.

Assessment and evaluation development opportunities have been made available on each campus through relationships with consultants or through formal programs and workshops. Consultants, as well as some faculty participants, shared their expertise in assessment and evaluation with other participants. As previously stated, a limited number of faculty seem to disregard the value of assessment and evaluation beyond informal or minimal qualitative feedback received from students.

Program Leadership

Program leaders continued to oversee grant-related issues at the system level (e.g., budgeting, recruitment of participants, participating in coordinating team meetings, scheduling professional development opportunities, meeting with faculty participants, working with external evaluators to collect data, and preparing the annual evaluation report). At a campus level, leaders continued to recruit faculty to commit and participate

in the grant, ensured faculty stayed on-task and on schedule with their research, and kept up with reporting deadlines. Faculty leaders found one challenge to be addressing problems or lapses in communication arising within groups or teams.

Campus coordinators also mentioned the generation of scholarship has been positively embraced by audiences, a wide array of faculty are actively participating in grant activities, and are enthusiastic in their participation. Coordinators also perceived that faculty are using new, effective technology to better engage students; and there is greater appreciation of grant ideals of scholarship, collaboration, assessment, and evaluation.

Coordinators on all campuses mentioned that formal operating procedures were critical in managing the program, in addition to maintaining program momentum, interest, and collaboration.

Year 2 Accomplishments and Challenges

Accomplishments

The University of Minnesota has realized a number of significant accomplishments during the second year of the continuation grant. To better illustrate their relationship to the grant outcomes, they have been divided into two sections—Student and Faculty Learning and Grant Processes and Procedures. More detail can be found in Chapter 4.0 of this report.

Student and Faculty Learning

- The grant continued to improve faculty opinions about teaching and research.
- Projects are focused on enhancing Student Learning by implementing innovative teaching techniques and strategies.
- The grant is inspiring active participation in publishing and presenting findings.¹
- The grant is inspiring stronger collaboration among participants.

Grant Processes and Procedures

- The development of formal operating procedures has facilitated the implementation of the grant and are used to enhance networking and the sharing of resources across campuses.
- The grant has continued to allow the four campuses to improve communications and develop closer working relationships.
- Grant administrators have made significant strides towards standardizing the definition of scholarship for all grant participants.

¹ A list of all presentations and publications resulting from Bush grant efforts is included in Appendix E.

- Evaluation data reveal that the four campuses have directly related their research for the grant to the existing strategic initiatives on their campuses.

Challenges

Throughout Year 2 of the Bush grant, MGT and grant PIs identified challenges that the university would face in the coming year that could be addressed to reduce their impact as the grant moves into the final year. They are divided into two sections—Student and Faculty Learning and Grant Processes and Procedures. More detail can be found in Chapter 4.0 of this report.

Student and Faculty Learning

- Grant administrators must continue to push participants to follow through in their efforts to generate data and report findings.
- Faculty participating in focus groups indicated that, though they are meeting together more as a group, they still desire further opportunities to meet with faculty outside of their teams, small groups, or campuses.

Grant Processes and Procedures

- Many of the resources and training opportunities made possible through the grant would be beneficial to a broader audience of grant participants. Grant leaders should continue to find ways to share these resources in Year 3 of the grant.
- The continuance of a faculty development infrastructure that would persist beyond the termination of the grant is a concern. The Bush grant currently serves as a major entity driving faculty development on the smaller campuses.
- Inconsistency in reporting standards has hindered the external evaluator's ability to evaluate some aspects of grant proceedings on a uniform basis across the campuses.

Recommendations

These are recommendations that the evaluation team believes will improve the University of Minnesota's ability to continue to implement the Bush Foundation Grant effectively and are designed to address the challenges identified above. These recommendations are in no particular order but are divided into two categories—Student and Faculty Learning and Grant Processes and Procedures. More detail on these recommendations can be found in Chapter 5.0.

Student and Faculty Learning

1. Emphasize the need for collecting and communicating evaluation data from local evaluation activities.

2. Continue to promote a scholarly and collaborative approach to teaching and learning.
3. Devise a plan to create more networking opportunities for grant participants and formalized information-sharing channels to promote internal and cross-campus collaboration and dissemination of information.

Grant Processes and Procedures

4. Develop a more collaborative approach to enable campuses to share grant-related resources and staff development opportunities.
5. Explore funding opportunities beyond the Bush Foundation to allow for grant activities and research to continue beyond 2007.
6. Ensure evaluation protocols and documents are used across all campuses for consistency in the reporting of data.

CHAPTER 1.0:

Grant Overview

1.0 GRANT OVERVIEW

Since March 2001, through two three-year grants, the Bush Foundation has supported an initiative to enhance student learning on the four University of Minnesota campuses—Crookston, Duluth, Morris, and Twin Cities. The goal of the initiative has been to foster the development of faculty skills for integrating innovative teaching practices, including new developments in technology-enhanced learning, to address problems of student learning. Currently, the University is in Year 2 of the second three-year grant.

1.1 2005-2007 Grant

Each of the four campuses reviewed its 2001-2004 grant efforts in light of the lessons learned. In response to the evaluation findings, each campus determined specific ways to extend and/or adapt its efforts to enhance student learning through instructional technology and other innovative teaching strategies for the 2005-2007 grant period.

The four campuses proposed the following three goals to unite their efforts and design specific program activities:

- **Goal 1: Align grant efforts with current campus initiatives to keep student learning in the forefront.**

Given the competing demands for their time, faculty need to: (1) know that they are part of an institutional culture that values enhancing student learning and (2) have ready access to programming that promotes their growth as teachers. When institutional priorities and faculty commitments are aligned with each other and keep student learning in the forefront, the result is a win-win situation for faculty, students, and the institution.

- **Goal 2: Foster a scholarly and collaborative approach to addressing student learning issues.**

A key characteristic of a learning organization is the ability of its members to learn together and to add value to the organization by converting individual information into organizational knowledge. Each of the campuses designed program components to encourage faculty and instructional staff to reflect on their experience as teachers, discuss their insights with teaching colleagues, read literature to inform their thinking, and use the classroom as a laboratory to systematically investigate questions about enhancing student learning.

- **Goal 3: Integrate the assessment of student learning and the evaluation of student learning initiatives into the campus mainstream.**

Assessment of student learning has become an important and highly visible component of higher education institutional improvement, accountability, and accreditation. Faculty use both informal classroom assessment techniques and formal course assessment procedures to understand what their students are learning, then use these findings to shape their teaching. In the proposed grant continuation, each campus plans to use assessment to create better conditions for teaching and learning.

The learning issues to be addressed by each campus during the grant continuation are outlined in Chapter 3.0 Evaluation Summary and Highlights of Campus Participation. That chapter also outlines each campus's implementation plan, along with its methods of evaluating those efforts and disseminating related findings.

The University of Minnesota has completed the second year of their Bush Continuation Grant.

1.2 Evaluation

The external evaluation of the grant continuation was designed to fulfill information needs that go across campuses, and to answer questions that are of common interest. The external evaluator is working with campuses in a variety of ways to coordinate activities at the system-level. Campuses have been encouraged to engage in local evaluation activities that can be reported in their annual project reports. The evaluation plan was modified somewhat in Year 2 to address the following guiding questions so that annual comparisons could be made:

A. Evaluation of Program

1. To what extent did the faculty development activities on each campus help participants:
 - meet their campus program needs and expectations;
 - use scholarly and collaborative approaches to address student-learning issues; and
 - use classroom assessment techniques and course evaluation findings to shape their teaching?
2. To what extent did each campus meet its goals in terms of:
 - engaging the desired number of instructional staff and students in grant-related projects; and
 - involving the desired number and types of courses?

B. Evaluation of Program Participants

3. To what extent did program participants:
 - align their projects with strategic campus initiatives;
 - use a collaborative and scholarly approach to teaching;
 - assess student learning in their courses;
 - use information gathered from assessment and evaluation to inform their course redesign; and
 - change their attitude toward a scholarly and collaborative approach to teaching?

C. Evaluation of Program Leadership

4. What lessons did program leaders (campus coordinators, consultants, Principal Investigators) learn?
 - What tasks did leaders need to complete?
 - What challenging issues did leaders need to address?
 - What were the most important successes?
 - What processes emerged that were critical in managing the program?

The following outlines the roles and responsibilities of the grant coordinating team for the purposes of the evaluation:

- Grant Principal Investigators (PIs):
 - Monitor project implementation at each campus and conduct monthly conference calls with campus coordinators.
 - Serve as the primary contact to the external evaluator for the systemwide evaluation.
 - Monitor monthly progress reports from the external evaluator and disseminate information to campus coordinators; make adjustments to the implementation process as necessary.
- Campus Coordinators:
 - Write annual program reports describing implementation of program activities, local evaluation findings, coordination with other campus initiatives, and lessons learned.

- Submit annual process data to the external evaluator according to a standardized form.
- Participate in planning sessions with the external evaluator to develop a common faculty survey.
- Provide feedback on other system-level evaluation tools and procedures.
- Share findings generated by the external evaluation with campus colleagues.
- Work with external evaluators to finalize campus evaluation designs and develop data collection instruments.
- Participate in annual coordinator interviews.
- Participate in regularly scheduled conference calls.
- External Evaluator (see Appendix A to learn more about MGT):
 - Upon request, provide recommendations to campus coordinators with regard to evaluation designs and data collection instruments for local evaluations.
 - Develop protocol for reviewing evidence that supports and documents course redesign on a per term basis.
 - Develop, administer, analyze, and report faculty survey findings per term or year as appropriate.
 - Conduct faculty focus groups annually and report summary data.
 - Conduct monthly evaluation calls with campus coordinators.
 - Suggest common report format for annual campus coordinator reports.
 - Write two annual reports and one final report describing the external evaluation and summarizing themes from annual campus reports.

CHAPTER 2.0:

Methodology

2.0 METHODOLOGY

The purpose of this project was to evaluate how each campus extended and/or adapted its efforts to enhance student learning through the use of instructional technology and other innovative teaching strategies. As previously mentioned, the four campuses proposed the following three goals to unite their efforts and design specific program activities:

- Goal 1: Align grant efforts with current campus initiatives to keep student learning in the forefront.
- Goal 2: Foster a scholarly and collaborative approach to addressing student learning issues.
- Goal 3: Integrate the assessment of student learning and the evaluation of student learning initiatives into the campus mainstream.

2.1 Evaluation Approach

In Year 1, MGT developed an evaluation plan, in consultation with grant Principal Investigators (PIs), that would ensure that qualitative and quantitative data were collected and analyzed to measure the impact of the grant on student learning in relation to the aforementioned goals. The plan was also structured to address the guiding evaluation questions listed in Chapter 1.0 of this report.

To evaluate the project in Year 1, MGT:

- developed evaluation procedures and documentation tools;
- conducted data collection and analysis as outlined in the evaluation plan;
- participated in monthly video conference calls with grant coordinators;¹
- conducted a minimum of six conference calls with campus coordinators;
- conducted site visits to each of the four participating campuses;
- prepared and delivered six evaluation progress reports; and
- prepared the year-end evaluation report for the Bush Foundation.

¹ Monthly video conference calls were suspended during the summer of 2005 and 2006.

At the beginning of Year 2, MGT met with the grant PIs to revise the evaluation plan for the upcoming grant year based on lessons learned in Year 1. These modifications are reflected in the methodology that follows.

2.2 Evaluation Procedures and Documentation Tools

Several different data gathering techniques were employed during Year 1, including faculty reflection logs, a faculty survey, focus groups, and interviews. In Year 2, MGT replaced the faculty reflection logs with course profile forms.

Copies of all data collection instruments are included in Appendix B of this report.

2.2.1 Faculty Reflection Logs/Course Profiles

At the beginning of Year 1, MGT collaborated with the campus coordinators to develop an electronic faculty reflection log for grant participants to complete on a monthly basis to journal their grant activities and research. The reflection logs were developed in January 2005 for faculty to begin reporting in February.

During focus groups with faculty at the end of Year 1, MGT consultants learned that faculty did not find the faculty reflection logs useful for tracking their grant progress because not all participants were implementing on the same schedule. In some instances, faculty could not report on progress due to the complexity of the data they were collecting. As a result, faculty suggested they complete a course profile that reflected much of the same information as was to be recorded in the logs, with several additions, such as key findings and outcomes. The majority of participants agreed that completing these at the end of each semester would enable them to provide more meaningful data.

MGT discussed this change with the grant PIs and campus coordinators, and resolved that course profiles would be completed by participants for Year 2 within a time frame to be determined by the campus coordinator. MGT and the grant PIs drafted a course profile form that would be a journaling document for participants to update at the end of each semester, at a minimum. On three of the campuses, participants are completing these forms at the end of each semester, and on the fourth they are completing them bi-monthly.

MGT consultants used course profiles to monitor progress of faculty and stay updated on the research for each campus. Profiles were also reviewed to identify successful innovative teaching strategies implemented by faculty. Outcome data on these strategies are reported in the summary sections of Chapter 3.0.

Additionally, data collected from these profiles, as summarized by campus coordinators, are used to supplement data collected from MGT's site visits and the annual faculty survey. Final course profiles for Year 2 are included in Appendix D of this report.

2.2.2 Faculty Survey

In Year 1, MGT developed a faculty survey in January 2005. The electronic survey was customized to ensure that it addressed the specific goals of the Bush grant project. Prior to administering the survey from mid-February to mid-March, MGT submitted it to the campus coordinators and grant PIs for review.

In Year 2, minor revisions were made to the survey to allow MGT to group grant participants into cohorts based on when they started the research under the continuation grant, with the understanding that all faculty who completed the survey in Year 1 were considered Cohort 1. Letters instructing faculty to complete an electronic survey were developed by MGT and the grant PIs. The PIs distributed the letters to grant participants in February 2006.

Along with other data collection efforts, MGT used these groupings to compare the changes in faculty's definition and attitudes towards the importance of a scholarly and collaborative approach to teaching during the course of the program based on the cohorts. Survey questions that relate specifically to scholarly and collaborative approaches to teaching are compared annually. While MGT is reporting major changes in the faculty in this area for Year 2 (see Chapter 3.0), this goal will be examined in more detail by cohort once the final survey data are collected in Year 3.

Additionally, MGT monitored how faculty's attitudes towards assessment and evaluation strategies changed as a result of their involvement with the grant. Again, survey questions that relate specifically to assessment and evaluation are compared annually by cohort, and major differences in relation to this goal for Year 2 are reported in Chapter 3.0. Questions in this area will be examined more closely and additional details will be reported by cohort once the final survey data are collected in Year 3.

Surveys were analyzed using the Statistical Package for the Social Sciences (SPSS). MGT consultants and analysts examined the frequency of responses in relation to the number of faculty responding to the survey for Cohorts 1 and 2. The mean, median, mode, and standard deviation were also calculated and reported for each survey item.

Data collected from the Year 2 survey are reported in Chapter 3.0 and Appendix C of this report.

2.2.3 Interview and Focus Group Guides

In order to conduct the interviews and focus groups with grant participants, MGT visited each of the participating campuses in November 2005 and October 2006. Interview and focus group guides were developed to ensure consistency among the visiting consultants. These guides provided detailed questions, areas to be probed, follow-up topics, and a general format for the visits. Interview and focus group guides were revised in Year 2 to address more of the issues facing grant participants.

Stakeholder focus groups included faculty participants, consultants, and graduate and undergraduate students. At the conclusion of the site visits, MGT conducted an interview with the grant PIs and orally reported on data collected from the interviews and focus groups. Summaries of these visits are provided in Chapter 3.0.

Data collected from these interviews and focus group were analyzed and used to supplement faculty survey responses. Additionally, these data were compared with data collected in Year 1 to look for common themes, changes in grant activities and outcomes, how the grant impact had changed, common successes and challenges, how support systems may or may not have improved and/or changed, and any differences between faculty that began the grant in Year 1 versus Year 2. These data were also compared with faculty survey responses.

2.2.4 Other Data Collection Activities

In addition to the aforementioned data collection activities, MGT participated in monthly video conferences with campus coordinators and grant PIs during Years 1 and 2. During these calls, campus coordinators provided brief updates on campus activities related to the Bush grant, and systemwide evaluation issues were discussed. MGT consultants conducted follow-up conference calls with campus coordinators to discuss campus activities in more detail, as well as local evaluation issues or concerns.

Following these periodic conference calls, MGT submitted a progress report to the grant PIs and campus coordinators detailing campus activities and systemwide issues or concerns. These progress reports also highlighted key upcoming evaluation activities.

Other data collected by MGT included minutes submitted by campus coordinators from meetings and workshops with participants, information on workshops and training opportunities available to campus participants through Bush grant resources, and PowerPoint presentations from monthly meetings/presentations of campus participants.

2.3 Year-End Evaluation Report

When all the data had been gathered and all the site visits had been completed, MGT began the process of preparing the evaluation report for Year 2. The following activities, among others, were completed during this process:

- analysis of the final data for Year 2, as described in the data collection subsections above, with comparisons to Year 1 where appropriate;
- identification of the issues to be addressed in the report;
- description of the background of the project and the methodology employed to complete the evaluation;
- preparation of a draft report for review by the grant PIs and campus coordinators;
- modification of the report based on corrections and/or omissions suggested by those reviewing the draft; and
- finalization of the report and submission to the Bush Foundation.

CHAPTER 3.0:

***Evaluation Summary and Highlights
of Campus Participation***

3.0 EVALUATION SUMMARY AND HIGHLIGHTS OF CAMPUS PARTICIPATION

This chapter provides a comprehensive review and analysis of the implementation of the Bush Foundation Grant on each campus and systemwide by focusing on the progress made in Years 1 and 2 in meeting the goals of the grant. It is organized into the following sections:

- Section 3.1: Alignment of Grant Efforts with Current Campus Initiatives
- Section 3.2: Fostering a Scholarly and Collaborative Approach to Learning
- Section 3.3: Assessment and Evaluation of Student Learning
- Section 3.4: Faculty Professional Development Opportunities
- Section 3.5: Program Leadership

Supporting documentation for the aforementioned sections may be found in the appendices of this report.

3.1 Alignment of Grant Efforts with Current Campus Initiatives

Data and documents compiled by the Principal Investigators (PIs) and campus coordinators provided an overview of the activities planned as the grant moved into its second year. Surveys and interviews were conducted with grant participants to provide in-depth detail on the research projects implemented at each of the campuses. Faculty participants also updated course profiles from Year 1 to expand research activities and report outcomes. The information collected addressed the following research questions:

- To what extent did each campus meet its goals in terms of engaging the desired number of instructional staff and students in grant-related projects?
- To what extent did each campus meet its goals in terms of involving the desired number and types of courses?
- To what extent did program participants align their projects with strategic campus initiatives?

To what extent did each campus meet its goals in terms of engaging the desired number of instructional staff and students in grant-related projects?

Campuses generally met their goals for involving staff and students in support of the research projects being funded at each site.

- The Crookston campus received minimal support from its technology department to meet project needs, but managed to keep key administrators (campus-wide, academic affairs, and student services) apprised of grant-related proceedings on the campus. The campus intends to improve relations with the technology unit in the coming year.

- Staff from Instructional Development Services (IDS) and Information Technology Systems and Services (ITSS) were heavily involved in supporting Bush grant projects on the Duluth campus. Staff from these units were engaged, respectively, in supporting the professional development and technical needs of participating faculty.
- The Morris campus proposed the participation of five professional and support staff in its application, and ultimately engaged eight. It also proposed the involvement of four students for support, and engaged five. The campus thus exceeded its goals for involvement in both cases. Staff participated in the IT Core and IT Consultant groups, while student assistants were primarily involved in helping participants with their research efforts.
- Each of the Twin Cities course teams was assigned two consultants to assist with research and implementation. Additionally, student assistants were funded for each project to assist in data collection, analysis, and other tasks as desired by the faculty. Additionally, student assistants were funded for each project to assist in data collection, teaching activities, course web site or content development, and other tasks as desired by faculty.

To what extent did each campus meet its goals in terms of involving the desired number and types of courses?

Across all campuses, efforts generally met or exceeded goals and expectations for the number and types of courses involved.

- On the Crookston campus, as many as five projects were planned for Year 2, but two of these participants decided to wait until Year 3 to initiate their work, while one other prospective participants utilized interventions stemming from the Bush grant but failed to participate in necessary reporting activities. As a result, the campus ultimately engaged two faculty in formal research projects for Year 2. Informal involvement was much higher, however, as approximately 30 faculty participated in various Faculty Learning Community (FLC) meetings and development opportunities over the course of the year.
- Project work on the Duluth campus involved a total of 16 courses in Year 2 and covered a variety of disciplines, as well as both upper- and lower-division courses. Six of the courses were continued from Year 1. The campus engaged an additional 10 faculty/courses to participate in Year 2.
- The Morris campus engaged faculty in 11 projects (courses) in Year 2 of the grant (more than double the allocated funding levels, which covered only five projects), spanning a wide variety of disciplines. The overall effort on campus engaged 18 faculty (in terms of direct project or consulting involvement), nearly double the campus's goal of ten.

- The Twin Cities campus involved ten course teams in Year 2. Twelve teams were originally allocated and participated in Year 1, however, two did not continue in the second year. The projects covered a broad range of disciplines and upper- as well as lower-division undergraduate courses.

To what extent did program participants align their projects with strategic campus initiatives?

Participants from each of the campuses engaged in projects that were well aligned with strategic campus initiatives. Goals and successes in this regard, as reported by participants and administrators, are detailed below.

On the Crookston campus, the following observations were made:

- Two of the six elements of the campus's vision (as identified by the Strategic Positioning Task Force) entailed "excellence in teaching" and "active learning." The campus research goal of using collaborative learning to enhance its teaching efforts is directly aligned with these two priorities.
- Otherwise, the campus has a long-standing institutional student learning goal to emphasize "working with others" and "teamwork," both of which, again, align very well with the campus's Bush grant research focus.
- In practice, the overall research goals, both in terms of campus-specific aims and over-arching Bush grant ideals, are clearly evident in both projects on campus, which focus on improving student learning through experiential pedagogies that involve collaborative learning.
- Additionally, campus administrators (Chancellor and Vice Chancellor) referenced campus goals of delivering "value-added" learning experiences, reaching a diverse body of students, incorporating beneficial technologies, focusing on applied knowledge, and attracting and retaining students as other important aspects of the campus mission that they perceived as being forwarded by Bush grant efforts.

Reports of efforts towards aligning projects with strategic campus initiatives on the Duluth campus included the following:

- One goal communicated by campus administrators is to improve student retention, particularly in large and/or lower-division courses. Many of the projects on this campus focus on improving performance in this area.
- Some faculty indicated a lack of a clear vision for the campus, and viewed the Bush grant efforts as filling a much needed void in terms of providing milestones and targets for improvement. Consistent with

this idea, the goals set forth for the research projects appear to be evolving into “grass roots” strategic campus initiatives.

- The development of reflective instructors that are actively monitoring and improving upon/refining their classroom efforts is one such goal that has been established through grant efforts. A corollary of this approach is the design and implementation of improved teaching methods and learning outcomes.
- Dissemination of research is another goal that has been established through the Bush grant. To this end, project efforts have yielded two journal articles and six presentations at disciplinary conferences, as well as several internal and systemwide presentations.
- A final goal set forth as part of the Bush grant was to increase use of technology on campus in an effective manner, and many course interventions (e.g., the use of Personal Response Systems, course web pages, online assignments, and ePortfolio) have targeted this ideal.

Participants and administrators from the Morris campus indicated the following goals and efforts with regard to aligning projects with campus initiatives:

- Many projects have sought to improve faculty’s abilities to address diverse learning styles and thereby improve student engagement, both a campus and Bush grant initiative. To this end, 12 to 15 courses will have been directly affected by grant efforts over three years, while additional thrusts will work towards disseminating these findings to a larger portion of the campus.
- A second campus goal of developing an integrated, coherent support structure for instruction is also integral to Bush grant efforts. The campus reports improved satisfaction with these services and increased resource availability as evidence of success. The Instructional Technology Group has been established as a more permanent entity to ensure ongoing progress and improvement in this area.
- Pursuant to the its Strategic Three-Year Plan, the campus has two main goals: (1) attracting and retaining a high quality and diverse body of students, faculty, and staff; and (2) improving student satisfaction and retention through innovative classroom instruction, careful and responsive academic advising, high quality academic support services, and meaningful co-curricular opportunities. Grant efforts have aimed to further these goals through developing more diversified teaching strategies, training faculty to handle the changes necessary to accommodate evolving student needs, and providing a support structure to assist faculty in these efforts.

On the Twin Cities campus, the following observations can be made relative to aligning projects with strategic campus initiatives:

- As part of the Twin Cities' efforts to become one of the world's top three public research universities, continued improvements in research publication and teaching methods and strategies are necessitated. The design of the Bush grant administration on the campus is engineered to further both of these aspects, jointly, by challenging participants to "[approach] their teaching through the lens of a researcher."
- The goals for scholarship, collaboration, innovative course redesign, and research support the University of Minnesota's strategic goals of recruiting, educating, challenging, and graduating outstanding students; recruiting, mentoring, rewarding, and retaining exceptional faculty and staff; using resources responsibly; and promoting innovation.
- Each of the funded projects on the campus had some application to one or both of these goals.

Exhibit 3-1 summarizes the research projects being conducted systemwide as a part of the Bush grant based on data collected from faculty course profiles completed at the end of Year 2. Specifically Bush grant research is impacting the following:

- Crookston: Three projects, approximately three faculty and approximately 115 students per semester;
- Duluth: 19 projects, 19 faculty and approximately 2,451 students per semester;
- Morris: 11 projects, 13 faculty and an average of 512 students per semester; and
- Twin Cities: 10 projects/course teams, 15 faculty and approximately 2,182 students per semester.

Analysis of the data from these research projects is included throughout Sections of this Chapter as it relates to the grant's goals and objectives. Complete copies of course profiles for each campus may be found in Appendix D.

**EXHIBIT 3-1
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Crookston	HRI 3900 – Internship (secondary class is “Cases and Trends in Hospitality Management”)	How well the student is able, in on-the-job situation, to identify peripheral information vs. key facts and issues and write a reflective analysis of what happened as well as showing choices (options) and their strengths and weaknesses.	We will take the list of students that are registered for internship and identify those who would be able to participate in this project (example: eliminating those that won't have Internet connections) and then randomly select from those the students who will be participating in this activity. Participating students will be divided into groups (Web Discussion Groups) of four to six (4 - 6) . We anticipate approximately six to eight (6 - 8) groups (3-4 HRI and 3-4 Mgmt).	Students enjoyed the learning opportunity of participating in writing and reading situationals. The situational web page we provided was informative. The situationals helped me look more closely at the situation and consider possible alternative options. Participating in the forum (chat room) gave me a chance to better appreciate the situations I, and others, face.
Crookston	Econ 2101 – Microeconomics	Is a collaborative learning teaching method more effective than a traditional lecture method in enhancing student achievement in economics?	The research involves a controlled experiment in which students enrolled in the course in the fall 2005 semester were treated as the control group and were taught using the traditional lecture method. Students enrolled in the course in the spring 2006 semester were treated as the experimental group and were taught with a collaborative learning teaching method. In both semesters a web-based polling system was used to ask students questions during class time to which they responded in real time using their own computers. In the control group students answered the questions individually, but in the experimental group students were required to discuss the questions in small groups before registering their answers.	Preliminary results from estimations indicate that collaborative learning teaching method positively and significantly affects students' stock of knowledge at the end of the semester as compared to a traditional lecture method. On the average each student in the collaborative group gave 2.5 more correct answers on the instructor-made final exam and 2.2 more correct answers on post TUCE as compared to students in the control group.
Duluth	CS-1511 – Computer Science I and CS-1121 – Intro to Programming in Visual Basic	This project seeks to improve the learning environment in several large lecture classes by introducing a series of reflective opportunities that students can use to 1) come to understand themselves as learners, 2) state their initial goals and strategies for the course, 3) determine whether their strategy was effective after each exam and allow them to reformulate a new one based on dropping unproductive methods, and 4) reflect back on the course as a whole and their growth as learners.	The four areas listed in the research question are served by four measurement tools:1) An online learning styles survey (Soloman-Felder ILS) 2) A first week statement of goals and strategies 3) Post-exam reflection (online survey, done after each exam) 4) Web logs tracking student use of online materials. ILS instrument and post-exam analysis data are gathered using TestPilot (an online tool). The goals and strategies are hand-coded. Web data are gathered by a cgi script that logs Web page hits, or by WebCT for classes using it.	Learning style profiles are compiled each semester during the first week of class and are shared with the students during the second week. Profiles reveal strong visual learning preferences and tendencies toward sequential, sensory approaches to learning. The ILS data have not been correlated yet with the post-exam reflection data.

EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Duluth	Biol 1011 – General Biology	I would like to find some way for students to improve their ability to assess their understanding. So many students indicate that they thought they knew the material but performed poorly on exams. I would also like to find some way to help students learn how to “think” like a scientist. To move away from memorization towards understanding.	Fall 2005 and spring 2006 gave students “practice exams” consisting of 20 multiple choice questions after every three chapters covered. Did not give practice exams before Exam I in fall of 2006. Will give practice exams before Exam II and will query students as to benefits of “practice exams.” Will compare scores on first exam (which included pre-exam practice tests) against scores on second exam (which will not include pre-exam practice tests).	1) Exam I and Exam II same semester showed 2.2 points' improvement with practice exams. 2) Compared scores using same exam from two different semesters to see if practice exams helped. Students scored four points higher on same exam with practice exams.
Duluth	SW8331 – Organization and Community Practice II	The objective of my study is to gain a better understanding of the impact of reflection using web-x discussion on: 1) student learning, and 2) student satisfaction with the course. The hypothesis is that students who share reflection papers with each other using the WebX discussion format will report that they learned more and are more satisfied with the course than students who simply turn in written reflections for feedback.	The research design is experimental using two sections of the same course. To select the experimental group, I randomly drew one of the course sections out of a hat. The other section served as the control group. The experimental group was required to do weekly reflections on the reading using WebX, a web-based method where the students were required to respond to each other's reflection. The other (control) group was required to hand in hardcopy reflections to the instructor and did not share these with each other. All students took a pre- and post-self-assessment regarding how much they felt they knew about specific course content. End of the Semester Course Evaluations will be used to evaluate differences in levels of satisfaction with the course between the experimental and control groups.	I am in the process of analyzing the data. A t-test on the mean score of the post-course ratings on “student hopes for the course” was statistically significant at the .01 level (17df). Students in the group that participated in the weekly WebX discussions indicated higher rates of accomplishing what they had hoped in the course than those who turned in weekly paper reflections to the instructor. There was no significant difference between groups in the level of satisfaction with the course as determined by the End of the Semester Course Evaluation. I am still going to run a few additional t-tests and will also analyze the qualitative data.
Duluth	ECON 2030 – Applied Statistics for Business and Economics	In my Business Statistics course I have been concerned that, while students do tend to master the mechanics of calculating inferential statistics, they do not have a real understanding of it in general. I believe that increasing the active participation of students while in class can greatly improve their understanding of the subject matter. In addition, improving assessment of learning will help me in gauging my own success as a teacher and will, in turn, help the students when I make changes based on that assessment that improve the course.	I will introduce the use of concept mapping into this course. Concept mapping is a method by which the various concepts taught throughout a course are integrated through the use of key words and symbols in a graphical format. By making the links explicit, it aids in students' understanding of the overall course content. In addition to collecting and evaluating the concept maps developed by students, assessment of learning outcomes is to be done through the use of pre-tests and post-tests of understanding of statistical concepts.	The results were rather disappointing, showing little evidence of impact from the introduction of concept mapping on learning outcomes. There was some evidence of improvement in study skills, but nothing powerful. There is more data analysis to be done, and we now have additional data to work with from another semester's class.

**EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Duluth	Primarily Math 3280 – Differential Equations and Linear Algebra. Some impact on Math 3298 – Calculus III.	Can in-class small group work be effective in teaching upper-level mathematics? Is it more effective than only lecturing? How can I use group work and worksheets most effectively?	To explore the use of worksheets in my Math 3280 course, I am writing and using a new worksheet for almost every day in class. Since I have not done this before, I am starting conservatively and focusing on simple worksheets for groups of one to four students. I use approximately 1/3 of the class time for these worksheets.	One clearly positive outcome is that I obtain feedback on the students' understanding of the material every day. In surveys, I have obtained overwhelming (almost 100%) support for the use of the worksheets, so it is at least clear that the students think they are effective. The class is relatively long for a math course (75 minutes per session), and so I take it as a measure of success when the students stay after class to continue working on a worksheet. In comparison to past courses, I am maintaining approximately the same pace covering the material, so the in-class time spent on worksheets has not impinged on the content. Overall I feel that this project is succeeding in improving the students' learning.
Duluth	Hlth 1470 – Human Nutrition	Does the use of a personal response system in a large lecture class increase student learning outcomes? Can the use of personal response systems accommodate different learning styles? Does the use of a personal response system increase instructor effectiveness?	Plant key questions/applications in classroom lectures using the PRS system. Plant other key questions/applications in online interactive format. Log students who choose to use TA study sessions. Determine which intervention (PRS, online interaction, or TA assistance) made the most difference in student outcomes as evidenced by scores on specific exam questions and the overall exam score.	The data gathering and analysis involve two phases. The first phase has gathered data (for one exam) being entered into SPSS 14. These data include student attendance at TA study sessions, use of an interactive study guide, participation in the classroom with a prs clicker, and performance on three key exam questions and the exam score. An attempt was made to help students perform at a higher level on Bloom's Taxonomy (i.e., analysis or application rather than at a lower level of simply knowledge). This phase of data entry is currently in progress. The second phase was a survey that was administered to two large lecture Human Nutrition classes on Nov. 1, the class period after the exam under study.

**EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Duluth	Comp 1120 – College Writing	My research seeks to answer these questions: 1) Will students write higher quality reflection statements regarding their work for Comp 1120 after answering straight-forward survey questions about their writing process than students who did not respond to such surveys? 2) Will students independently change the process they use for completing a writing assignment by identifying what that process was as well as what did and did not work well for them in using that process? 3) Will students make connections (in their reflective statements) between the writing they do for a first-year writing course and the writing they anticipate doing in other college courses by reflecting on specific lessons learned in completing a particular assignment? 4) Will students make connections (in their reflective statements) between the writing they do for a first-year writing course and the writing they may do beyond college by reflecting on specific lessons learned in completing a particular assignment?	My plan for evaluating the project is to analyze the reflection statements of the group of students who completed the survey instruments, comparing them with reflection statements written by students prior to the time the surveys were used. I plan to do a qualitative assessment of the content of the comments as well as a quantitative assessment of the length of the statements. In addition, I will analyze the reflection comments that were handwritten on the back of the survey instrument after the assignment was graded and returned to them.	At this point I have conducted a more thorough analysis of the data than at my last reporting. The analysis appears to show that most students (70% or more) overestimate the grade they believe they will receive on any given assignment by, on average, a full letter grade. Over 60 percent of students believe they revise their papers “thoroughly,” and three-fourths say they pay a “great deal” of attention to their peer reviewers’ as well as my comments on their papers.
Duluth	Chem 4341, Chem 4351, and Phar 6151	I am addressing multiple issues in my research. The first is the use of personal response systems (“clickers”) to evaluate the comprehension of the students during lecture. The second issue is to help the students develop critical thinking abilities and to critically assess their own understanding and take responsibility for areas of deficiency.	This semester I continued the use of the personal response systems. I administered post-exam surveys for the first two exams via TestPilot. Included in these surveys were questions regarding the usefulness of clickers. The post-exam surveys also probed the students’ perceived preparedness and performance. I ceased giving the post-exam surveys once I sensed that they were negatively influencing course instruction. I plan to analyze the data and evaluate how well the students assessed their performance for both spring and the first part of fall 2006 semesters. I need to devise a way to gather student data while minimizing my influence on the data.	Most of the data collected have not yet been analyzed.

EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Duluth	HLTH 1100 – Health and Wellness (2 sections)	Getting students more engaged in critical thinking exercises in class and not being lecture driven. Getting students to be more reflective in their writing about behavioral modification improvements. Raising the consciousness level of students to a higher level of thinking.	I started this semester by posing “clicker” questions for feedback on the usefulness of clicker technology (one notable strength and one notable weakness); did clicker technology enhance attendance and learning in the class? I decided how I would implement the research questions in the HLTH 1100 class this semester and again in spring 2007. I conducted the survey instrument in December 2006.	I have just collected my first set of data from both of my HLTH 1100 classes this past week. I have not analyzed the data yet.
Duluth	CC 3160 – Psychological aspects of coaching course	Examine meta-cognitive strategies of self-regulation in undergraduate students.	The data collection instrument used to identify which meta-cognitive learning strategies were used by the students in the course during the first year included two open-ended questions: 1) What strategies do you use that make you successful in earning high grades? and 2) What strategies do you use that make you unsuccessful in earning high grades? Following the data collection, the investigator classified the responses into meaningful categories using a content analysis process in which words or phrases used by the students were grouped into minor categories, which were subsequently grouped into major categories. By grouping the students’ responses, four major meta-cognitive strategies emerged: record keeping, planning and goal setting, seeking information, and environmental structuring.	Analysis of results for each item on the meta-cognitive learning strategy survey depended upon the type of question. For the ranking and multiple choice questions, the results were obtained by tallying the students’ choices and then summing the tallies. Due to the nominal nature of the data, the recommended method of analysis was to report the sum tallied scores for these questions and to calculate percentages (Pattern, 1998). Content analysis, as described for the first-year survey above, was also used to translate responses to the open-ended questions on the meta-cognitive learning strategies survey.
Duluth	Math 1250 – Precalculus Analysis	How does a technology-enhanced course affect student learning?	Use of a personal response system in lectures with content-related questions to gauge student learning. Use of online homework as a tool to facilitate self-paced student learning. Personal response quizzes are administered daily involving both review questions from the previous day’s lesson and current day’s course material. Personal response system provides immediate feedback to both instructor and student with assessment of learning and/or teaching. Results can be compared with exam results for the same content. Using online homework that is packaged with the text as an assessment tool in part as replacement for hand-in homework.	Based on survey questions, students perceive a benefit from the personal response systems both to their own learning and to my teaching. Initial responses indicate that students feel strongly that online homework helps students learn and review at their own pace and that the instantaneous feedback helps with retention of material.

**EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Duluth	Educ 7001 – technology and writing skills	The purpose of my project is to find out which communication tools are most effective from students’ perspective in: 1) Engaging students: level of interaction and connectedness to others; 2) Related to this is a sense of connection to a learning community; 3) Promoting depth of reflection and understanding of issues; 4) Motivating students to share their ideas; 5) Ease of use and reliability.	Pre-assess students’ knowledge of skill level using each tool prior to the start of the course. Teach students how to use each tool. Have students use the tools to share reflections on readings and to engage with each other (through using each tool) in discussing what they are learning. Post-assess student skill level using each tool. Survey students and have focus group to ask students which tool they thought was best in terms of (a) ease of use, (b) engaging with each other, (c) promoting depth of reflection, and (d) motivating them. Analyze blogs and transcripts of discussions, coding using the course rubric, to see which tools led to the highest level of depth of reflection and student engagement.	Based on this pre-assessment survey and other results, I revised the course so that I focused on teaching those skills in which the students rated themselves lowest and that they would need to use this first semester of their work in the M.Ed cohort, specifically wikis, blogs, and online class participation skills. Based on discussions with other faculty in the cohort and the students, I also spent some time teaching students how to use online research tools (Furl, RefWorks, Google Scholar, and UMD online databases).
Duluth	MU1101 – Music Theory I	My course of studying student learning has led me to a core question of students being engaged in, and inspired by, the material. I have turned towards the notion of finding ways of making the musical examples we study less abstract by working with full scores and pieces. Often in Music Theory, especially in the first year, we illustrate concepts through simple but not musically interesting examples. I am testing whether using concrete models from the masterworks literature, even from the outset, will bring greater interest to the discipline for the students. Also, this gives me the opportunity to flesh out the composer at hand in terms of historical importance and giving details about their lives and times – thus hopefully making the music come alive. The key for me is to show how concepts can be applied in real works of art and then have students compose their own pieces using the same techniques.	My methodology begins by presenting a musical concept in class through a series of score analyses that illustrate a specific technique, in this case the proper preparation and composition of a simple eight bar parallel period for these analyses. I have chosen piano sonatas by Haydn that I can play in class myself. I can then talk about each work, the circumstances in which it was composed, something about the man and the music of the era, etc. This first-hand engaging technique is designed to get the students interested in the music first, and then curious as to how they can write such a work using the abstract theoretical techniques that need to be studied.	So far, the students have just begun working individually on their final projects so the ultimate outcome is yet to be studied. However, I have noticed an increased level of interest in the students based on how many are asking about hearing more recordings of the kind of music I am playing in class. This shows real engagement and interest being instilled in the students as a whole and a critical development of their aesthetic understanding. The students also suggested many good ideas in the computer-aided group compositions and were happy with the outcome of the pieces.

**EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Duluth	Mirroring Practice and Preferences: Bush Colloquium III	Do your students know how they can study to increase their learning? Their own learning styles/preferences? How to reflect on their own learning processes and be actively engaged in creating their own scholarly identities?	<p>We assisted Bush participants in their research regarding “clickers” (personal responding systems) as they interface with a Bloom’s taxonomy; ePortfolio; Web sites; surveys online and on paper; identifying need and formulating research questions; and hybrid classes. We are preparing proposals to present at the Academy of Distinguished Teachers Conference on April 23. The clicker group has created its workshop agenda and has almost completed its ADT proposal. They will be giving their workshop here at UMD on March 29, 2007, as a “dress rehearsal.”</p> <p>In process. These projects are still evolving. However, we continue to assist in refining and developing research processes and analysis of results. However, in disseminating and presenting their early findings, our workshops help all participants and potential participants in developing a greater understanding of what is involved in the scholarship of teaching. We will also be able to judge our efficacy by the interest shown by non-participants who attend our workshops and who apply to participate in Cohort 3.</p>	In addition to attending the bi-weekly Bush meetings this fall semester, we worked with the individual subgroups when needed, continued to informally publicize the work of the group and its individual members, looked for ways to disseminate their findings, searched for resources for them, held workshops that would be useful and interesting to them, and facilitated their showcase workshop in Colloquium III.
Duluth	PHIL 1003 – Ethics & Society	How can I increase student reading and comprehension, and critical thinking skills? As a related issue, how can I better encourage class attendance and the careful reading of assigned texts?	<p>In fall semester 2006, I plan to offer several outside-of-class exercises (using Web CT) designed to encourage students to think and write critically. In addition, I plan to spend more time (given the large number of first semester freshmen in the class) encouraging reflecting learning skills, and to use some survey instruments to measure progress toward this end.</p> <p>As noted above, I will evaluate progress based upon these surveys (designed to assess how effectively students incorporate reflective learning and other reading and study skills) into their regular preparation for class. In addition, I will compare attendance records and course evaluations from previous sections of PHIL 1003, and will evaluate (qualitatively) the usefulness of the Web CT components of the course.</p>	Data to be gathered during fall semester 2006 (so none to report yet).

**EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Duluth	Soc 1080 – Development of Social Selves	Motivating students to be sure to read all of the assigned reading materials. Improving class attendance.	<p>My main focus is on assessing whether or not students do the assigned readings in their classes. I would like to arrive at ways to encourage students to do all of the reading, but in a way that is supportive and positive, rather than relying upon fear tactics.</p> <p>I think of my evaluation plan involving collecting data that will give me a better idea of where students are at in terms of their goals and strategies. While I realize that the data currently being collected by my research assistant cannot be generalized, I do think that the data will be useful.</p>	Last summer, I analyzed the qualitative data that the extra credit assignment provided. My research assistant is in the process of conducting and transcribing interviews – a very time-consuming project!
Morris	ELED 3102 – Literacy and Language Instruction in the Elementary School	Implementing Kolb's Learning Style Model in the Delivery of Education Curriculum	<p>As a result of these findings from my 2005 Bush Grant project, I will work on the following things that will support student learning during class presentations, in follow-up after class presentations, and as a result of improved communication with students about course content.</p> <p>Data will be collected on students' use of technology tools. Both quantitative and qualitative data will be used to evaluate students' learning as supported through use of these technology tools.</p>	
Morris	ELED 4103 – Science in the Elementary School and ELED 4107 – Health and Physical Education in the Elementary School	Increasing technology in elementary education with the ProScope microscope	Students who enroll in my ELED 4103 – Science in the Elementary School are at varying levels of confidence and competence in science subject matter. Research verifies that the majority of preservice elementary teachers, of whom the majority are females, do not like science and are not motivated to teach it. To help students learn about science and demonstrate new ways to teach science in the elementary classroom, I would like to integrate more technology into my course. I am hoping to increase future elementary teachers' content knowledge in science, as well as to demonstrate a way in which they can motivate their elementary students in engaging science lessons.	

EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Morris	Chem 2301-2 – Organic Chem I-II	Increasing student engagement in the organic chemistry curriculum through instructional technology	Research on the use of personal response systems (“clickers”) in lecture classes was carried out over the summer of 2006. As noted above, a date for implementation is unknown, but ideally would be spring 2007. Implementation of the use of a “smartpad” (already purchased) into Chem 2301 will take place during fall 2006. Improvement/enhancement of my use of WebCT in this course is ongoing. Finally, I would like to take advantage of UMChat as an interactive tool for use with my students (also fall-spring 06-07).	
Morris	Chem 1101 – General Chemistry I (SCI-L) and Chem 2301 – Organic Chemistry I (SCI)	Student response system	<p>I would like to incorporate the use of personal response systems in my general chemistry course. A common complaint students have in the course is the lack of interaction between student and instructor. Adding this new technology to the course may help to alleviate the deficiency.</p> <p>Once the technology is implemented, one method of assessment will be to place the personal response systems into one of two general chemistry lecture sections. The effectiveness of the technology will be gauged by a comparison of student performance in each of the two sections. Appropriate measures will be taken by the faculty to ensure an accurate assessment of student performance.</p>	
Morris	PSY 1051 – Introduction to Psychology and PSY 1081 – Drugs and Human Behavior	Addition of a learning styles assessment to existing online interactive study guide	As a continuation of the work a colleague and I have been doing with regard to assisting students to develop learning skills, the inclusion of a learning styles assessment and the possibility for making our existing web-based supplement more effective is intriguing. I would like to use this opportunity to explore ways to better assess student learning needs and work to match our advice to their needs. Using technology to allow for varied means of delivering this information and advice is a logical next step.	Students enjoyed using the clickers and getting credit for their daily work.

**EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Morris	Fren 1001-1002 and Italian 1301-1302	Creating associative learning tools for French and Italian courses	In a two-year requirement (which is the acknowledged standard), proficiency in both language and culture can be achieved. Yet the implied time bind of the one-year requirement puts these goals at odds with one another. Inevitably, the best intentions to cover both fields falter in the face of a vast majority of students who just want to do the bare minimum to finish. Although associative materials such as CD-ROMs are available as ancillaries to the textbook, a student who lacks motivation may never investigate materials to the extent that these become useful to him/her. Every component of a text package should engage multiple ways of learning at every stage of learning.	
Morris	History 1102 – Introduction to World History since 1500 and a carryover into History 3251 and 3451	Framing Hist 1102 – Introduction to World History since 1500	I will be teaching Hist 1102 as a semester long course for the first time in spring 2007. I last taught the course in spring 1998, when it covered only 1850 to the present, and I was not yet familiar with web-based instructional opportunities. My limited use of web-based instructional technology in other courses (WebCT for threaded discussions and access to instructional resources [lecture notes, reference materials]; PowerPoint for lectures and some use of online resources in class presentations or as supplemental resources) makes me eager to address some opportunities that IT provides to reach the diverse needs of the students enrolled.	
Morris	Math 1101 – Calculus I (M/SR), Math 1102 – Calculus II (M/SR), and Math 1021 – Survey of Calculus (M/SR)	Developing <i>Mathematica</i> modules for UMM Calculus courses	Through computer modeling and visualization, I was able to satisfy the students with diverse learning styles in the same class. Mathematics, traditionally, is not known as a subject with realistic applications. The computer modules helped the students to deal with more realistic applications than any problems and projects in textbooks. <i>Mathematica</i> is very difficult software to learn, because it requires a good deal of both computer programming and mathematics. Not all the students achieved the desired level of being able to start using and learning <i>Mathematica</i> on their own.	More than one colleagues are either using some of my modules or planning to use them in their classes.

EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Morris	All of the courses in the Art History discipline will be affected	Art history image library	Art history necessarily addresses visual and verbal learning styles. The art history discipline has an extensive slide library for these purposes, but shifts in the photography industry are mandating that we change to a digital image database. The first step in this process will scanning images from books and from the current slide collection. Our goal is to create a database that can be used by faculty and students in class, and used by students outside of class for various projects. In the end, such a database will be much more versatile and cost-effective than slides, allowing students to access images independently for study and research, something they cannot now do easily with the slide library.	
Morris	Pol 4221 – Judicial Politics (SS), Pol 1201 – American Government and Politics (E/CR), and Pol 3232 – Constitutional Law: Governmental Powers and Constraints (SS)	Student response system	I would like to work on integrating student response systems into my classes. I will need training on the use of such devices, as well as assistance in developing policies regarding their use.	Students enjoyed using the clickers and getting credit for their daily work and the fact that SRSs reward students who do daily work and show up for class. Students like the reward.
Morris	Innovative Teaching with Technology (new prototype course for faculty)	Innovative Teaching with Technology is a new non-credit course with information about a variety of tools that can be used to promote elements of the Seven Principles of Effective Teaching.	<p>We will use the UMWiki as the course container and integrate many tools and examples – closely tied to the Seven Principles of Effective Teaching. Research appropriate readings to go along with the seven principles. Pay attention to the technology adaptation paper regarding the seven principles and also find research about the effect on student learning using various tools such as discussion boards, PRS (clickers), chat, blogs, wikis, etc.</p> <p>Planned pre- and post-assessments will be included to evaluate faculty awareness of possible applications/tools for innovative use of technology in teaching. Pre-assessment will be self-paced as participants begin the course in late fall 2006. Post-assessment will also be self-paced, upon participants' completion of the course.</p>	

EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Twin Cities	Agronomy 1101 – Biology of Plant Food Systems and the Environment	How can we improve students' scientific reasoning skills? How can we increase student interest and motivation in the course?	In fall 2006, the Agro team will study the effects of PBL and group work on students' motivation to learn (intrinsic vs. extrinsic) and their approaches to studying (meaning vs. reproducing orientations). They will do this by means of a quasi-experimental approach in a single class involving three "treatments" (PBL + No Group, Group + No PBL, PBL + Group), using survey measures after each treatment. Surveys, inventories, scales, particularly the Approaches to Studying Inventory and Intrinsic Motivation Inventory.	Data being collected in fall 2006. Article describing the use of PBL in Agro 1101 has been accepted for publication in <i>The Creative College Teaching Journal</i> .
Twin Cities	ARCH 3711 – Environmental Design and the Sociocultural Context	We are now addressing improved links between lecture and recitation classes, TA preparation, and improvement of assignment description. At the same time, we seek to build on our new understanding of those activities students seemed to have gotten the most out of.	We will focus on evaluating the student appreciation of the recitations as learning experience, and further development of class exercises in lecture and recitation. We will also focus on TA development. We continue to combine quantitative and qualitative approaches. We have reduced the number of written student evaluations during the semester and have added the use of focus groups in the form of the Student Advisory Committee.	Survey data suggest that the gap between instructor and student perspectives continues to shrink. Students have increased understanding and appreciation of course content, especially the relation between the readings and the critical papers. Students felt better prepared for assignments.
Twin Cities	Biology 1001	No change: We still are concerned with engaging students better, increasing class attendance, increasing student preparation for class, and getting students actively involved with course material.	My co-instructor and I used IFATs extensively during summer session, in addition to unannounced quizzes introduced last spring. This fall, a lecture section that historically enrolled up to 600 students was split into two smaller sections that have the same two instructors and identical laboratory experiences. The first section has text-based lecture, unannounced quizzes, two multiple-choice midterm exams, and one multiple-choice final. We consider it the "traditional lecture" or our so-called control group. The second section has structured group activities, extremely shortened lectures, unannounced quizzes, a few graded homework assignments, and the same multiple choice midterms and final as the first section. This is our experimental or "active learning" section.	IFATs greatly increase student interest and involvement in class. Increased involvement and attendance over summer was reflected in higher final grades (higher proportion of A's and B's) than in typical previous offerings. Exam scores appear to be essentially identical in the active learning and traditional lecture sections taught by the same instructors. Students expressed opinions that group work helped eliminate the alienating feeling of being in a large lecture course.

EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Twin Cities	CSci 1901 – Structure of Computer Programming I	No, the issues remain the same: how to engage students in a large class teaching material that is conceptually difficult.	No, the project remained the same. In spring 2007 we plan on repeating what we did in spring 2006, i.e., short quizzes in preparation for the exams, more written homework, a lab using the Sony AIBO dogs to engage the students in a collaboration/competition activity, and a student management team. We plan on adding one more lab with the AIBOs, and on adding a short lecture on using the career center for career planning. No. In spring 2006 we did four questionnaires during the semester. For Spring 2007 we are planning on doing four or five questionnaires. We are considering asking students to include their ID on the questionnaire to be able to track them individually.	Nothing new. The undergraduate member of the team is writing his honors thesis on the work done last spring.
Twin Cities	FSoS 3101 – Personal and Family Finances	How can the course be redesigned in the fall of 2006 in response to survey findings?	Several interventions of varying kinds need to be implemented in order to make the treatment powerful enough to raise grades and retention rates. Surveys, classroom observations, and qualitative data were analyzed as recommended by Miles and Huberman. My colleague entered and analyzed both the quantitative and the qualitative data.	There was a statistically significant difference between the integrated and the single session approach on four survey items. The integrated approach had higher means than the single session approach on all four items. These statistical results are both exploratory and diagnostic, and need to be examined in light of a supporting theoretical rationale and additional sources of evidence. Because there are no controls for confounding, the evidence in favor of the integrated approach is not strong. For this reason, multiple sources of evidence, including qualitative results, are also needed to build a convincing argument in favor of the integrated approach.
Twin Cities	PsTL 1135 – Human Anatomy and Physiology	Do students' use of games (the newly constructed "Anatomy Bowl") improve their understanding of anatomy as measured on test performance? Does the use of the Anatomy Bowl increase student engagement?	Completed this semester: Course opinion surveys, data analysis of exam scores, and data analysis of Vista quizzes. The course opinion surveys now reflect questions geared toward the Anatomy Bowl activity. Example: "Too unreliable to be used for grades at this point. I don't like working in groups because we can't go at our own pace. I do not know! Use it for bonus points in competitions. Can be used as part of a prep for a quiz. For instance, after studying web anatomy for a while... I would use the game as a break to test where I'm at and what I have to work on. It's something a little less repetitive than Web Anatomy, because you're racing against someone."	I have not analyzed any new data. I have lots of data arriving at the end of this semester (course opinion survey, final exam scores, etc.).

**EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS**

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Twin Cities	GEO 1001	Our original specific tests changed significantly as early on we realized that (1) the anaglyph maps were far more effective in a lab setting; and that (2) much of the "at-risk" population was at risk because of outside factors that could not be addressed within the course.	<p>However, our main goal of more effectively helping students to learn the many complex interactions between geological processes and human society has not changed. This is the information they need to become more informed citizens in an increasingly global community. One of the most effective ways we have been able to do this is to emphasize historic interactions between human society and geologic processes. Although we were initially worried that students might not relate well to a historical approach, it has been remarkably effective.</p> <p>None since May, but we had already developed a fairly robust program of pre- and post-instruction assessment and have continued that program. Students would actually prefer that we spent less time assessing our course! Besides the in-class assessment, we have also continued our program of gauging students' understanding of maps and water flow processes as research project similar to those in Educational Psychology where students get extra credit for participating in out-of-class sessions.</p>	Over 96 percent of the students claim that the historical aspect of the course helps them to understand and enjoy the course material. We've continued to add to our list of recognized student misconceptions, including the (to us) staggering realization that over half of the students believe that "north" and "south" refer to up and down as well as horizontal directions. It was not staggering that they should think that, it was staggering that as instructors we never realized it! Targeted interventions that specifically target students' existing misconceptions provide the only means we have discovered to help lectures approach the effectiveness of lab instruction. Simply stating or showing the correct interpretation is not enough, you have to first refute existing misconceptions. Of course, this means that you first have to know what the misconceptions are!
Twin Cities	HMED 3001 – History of Medicine	Use a learner-centered, self-help approach to organize the topics for writing modules.	<p>Focus on the macro-level, e.g., building an argument, main ideas, organization. The writing activities will <i>not</i> be graded. The writing activities will <i>not</i> be compulsory. Try to find ways to integrate the writing modules into the course. Web-based, preferably in a web-appropriate format. Try to avoid PDFs of paper documents. Use short readings, e.g., scholarly essays or book reviews.</p> <p>The data collected in the spring of 2006 consists of meeting notes and emails with the team members about the writing modules. The data for the fall will consist of interview notes with the professor, meeting notes, SGID notes, and local classroom assessment data.</p>	Students come to the course with a wide range of writing abilities, and are confronted by lots of course reading and very little free time. Writing is a "high-stakes activity for them." Christine's plan is to have the students pick and choose what to work on, so that the modules do not seem like a burden. Common problems include organization, argumentation, and writing with authority. As an expert, the professor "can't get what they don't get." Some students went to the writing center (WC) for individual consultations and found it very helpful. Some believed they had no problems with their writing until a WC consultant said they couldn't follow what they were trying to say.

EXHIBIT 3-1 (Continued)
SUMMARY OF BUSH GRANT RESEARCH PROJECTS BY CAMPUS

Campus	Course(s) Impacted	Research Question(s)	Methodology/Evaluation Plan	Outcomes
Twin Cities	MKTG 3001 – Principles of Marketing	Research project focuses on staffing costs and staff/student ratios and the impact on student satisfaction and engagement. Can we increase class size without negatively impacting outcomes by utilizing Bush grant tactics/techniques?	Mixed methods quasi-experimental design. Data include survey data from two treatment groups, costs of two vs. four peer assistants, self-evaluation of progress notes and meetings with team members about the teaching and learning process. In addition, the same survey instrument will be administered in the other (smaller enrollment size) course sections. Surveys include SETs and student self-assessment of learning developed by the lead instructor. The entire group (instructors and PAs) meets at least once each week to discuss the previous class experiences, to critique the learning process, and to suggest next steps.	Course observation was conducted by the evaluation consultant in the fall of 2006. Observation notes were written up and shared with the faculty member. Consultants conducted a focus group in fall of 2006 with five out of the six peer assistants in this course regarding the roles and responsibilities of PAs, communication with faculty instructors, suggestions for improvement, and general observations about the benefits and challenges of the PA structure. These focus group notes were written up and shared with the faculty member. We collected the student self-assessment of learning from the sections not covered by the grant and will analyze them this coming semester.
Twin Cities	OMS 2550 – Business Statistics	The original research project was to incorporate active learning and classroom assessment techniques (ALT-CATs) to the lectures. Since May 2006 the pedagogy has been expanded to include multiple ALT-CATs during each week and even during each lecture period.	The research question has shifted away from expanded lectures vs. use of discussion sections. The research design will consist of a comparison between two large sections of OMS 2550 – Business Statistics. One section will include collaborative learning with ALT-CATs completed in small groups of three to four students. The control group will complete the same ALT-CATs but individually, not in groups. Measures of achievement will include performance on exams, total points, attendance, drop-out rate, GPA, and survey items that measure students' attitudes.	Data were collected during the spring semester of 2006. Additional data will be collected at the end of fall semester of 2006 for an Honors Section and again during spring semester of 2007.

In summary, Bush grant projects focus on the following research questions.¹

- Are students able to identify peripheral information vs. key facts and issue in on-the-job situations and write a reflective analysis?
- Is a collaborative learning teaching method more effective than a traditional lecture method in enhancing student achievement?
- In large lecture courses, can students reflect to 1) understand themselves as learners; 2) state their initial goals and strategies for the course; 3) determine whether their strategy was effective after each exam and can they reformulate new strategies based on unproductive methods; and 4) understand their growth as learners?
- Are students who share reflection papers with each other using the WebX discussion method learning more and more satisfied with the course than students who simply turn in reflections for instructor feedback?
- Does increasing active participation in class improve student understanding of subject matter?
- Can in-class small group work be effective in teaching upper-level mathematics? Is it more effective than only lecturing? How is group work used more effectively?
- Does the use of a personal response system in a large lecture class increase student learning? Can the use of these system accommodate different learning styles? Does the use of these systems increase instructor effectiveness?
- How does technology-enhanced instruction affect student learning?
- Which communication tools are most effective for engaging students, creating a sense of connection to the community, promoting understanding of issues, motivating students to share ideas, and are easier to use and reliable?
- Do students know how they can study to increase their learning? Do they know their own learning styles/preferences? Do they know how to reflect on their own learning processes and be actively engaged in creating their own scholarly identities?
- How can instructors increase student reading and comprehension, and critical thinking skills? How can class attendance and careful reading of text be encouraged?
- What is the effect of implementing Kolb's Learning Style Model in the delivery of education curriculum?

¹ Since some research questions cross a number of projects, this is a summary listing.

- What is the impact of increasing technology in elementary education with the ProScope microscope?
- How does instructional technology increase student engagements in organic chemistry?
- How do instructors engage students in a large class teaching material that is conceptually difficult?
- Does students' use of games improve their understanding of course content as measured on test performance, and what are the effects on student engagement?
- How does staffing (student/teacher ratios) impact student satisfaction and engagement? Can class size be increased without negatively impacting student outcomes?

3.2 Fostering a Collaborative and Scholarly Approach to Learning

To assess participants' definitions of and attitudes towards collaborative and scholarly approaches to learning, MGT analyzed information gathered from faculty surveys, course profiles, and focus groups. Information was also gathered from consultants working with faculty on the campuses, and from campus coordinators through on-site interviews and monthly conference calls. These data were used as multiple points of reference for data triangulation. The data addressed the following research questions:

- To what extent did program participants use a collaborative approach to teaching?
- To what extent did program participants use a scholarly approach to teaching?
- To what extent did program participants change their attitude towards using a collaborative and scholarly approach to teaching?

To what extent did program participants use a collaborative approach to teaching?

As previously mentioned, survey data were collected from participating faculty at the beginning of Year 2.² Forty-nine (49) faculty participating in the grant in Year 1 continued their research in Year 2. These faculty are identified as Cohort 1. Seventeen (16) faculty began working with the grant in Year 2, and are identified as Cohort 2. With regard to collaboration, survey analysis for Year 2 revealed the information shown in Exhibit 3-2.

² The complete systemwide survey analysis is presented in Appendix C.

**EXHIBIT 3-2
FACULTY SURVEY RESPONSES: COLLABORATION
YEAR 2**

Over the past year, to what degree has each of the following factors motivated you to change your course?	Year	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
Desire to facilitate communication between students and instructors									
Cohort 1 (n=47): Mean=3.23, Median=3, Mode=3, Std. deviation=.729 Cohort 2 (n=15): Mean=3.40, Median=3, Mode=3, Std. deviation=.632	2006	0%	0%	17%	7%	43%	47%	40%	47%
Desire to help students work more collaboratively									
Cohort 1 (n=47): Mean=3.23, Median=3, Mode=3, Std. deviation=.729 Cohort 2 (n=15): Mean=3.40, Median=3, Mode=3, Std. deviation=.632	2006	4%	0%	26%	40%	30%	53%	40%	7%
For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.	Year	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
Implementing team teaching or other collaborative approaches in courses									
Cohort 1 (n=46): Mean=2.02, Median=2, Mode=1, Std. deviation=.954 Cohort 2 (n=16): Mean=1.94, Median=1.5, Mode=1, Std. deviation=1.124	2006	37%	50%	31%	19%	26%	19%	7%	13%
Meeting informally with students outside of class, labs, or studios									
Cohort 1 (n=46): Mean=2.65, Median=3, Mode=3, Std. deviation=.924 Cohort 2 (n=16): Mean=2.88, Median=3, Mode=4, Std. deviation=1.088	2006	11%	13%	33%	25%	37%	25%	20%	38%
Discussing with colleagues your course content, materials, assessment techniques, and the like									
Cohort 1 (n=47): Mean=3.26, Median=3, Mode=3, Std. deviation=.706 Cohort 2 (n=16): Mean=2.69, Median=3, Mode=3, Std. deviation=.946	2006	0%	13%	15%	25%	45%	44%	40%	19%
Presenting on your discipline in a colleague's class									
Cohort 1 (n=47): Mean=1.87, Median=2, Mode=1, Std. deviation=.992 Cohort 2 (n=16): Mean=1.81, Median=1.5, Mode=1, Std. deviation=1.047	2006	45%	50%	34%	31%	11%	6%	11%	13%
Inviting colleagues to review your syllabi or teaching materials									
Cohort 1 (n=46): Mean=2.39, Median=2.5, Mode=3, Std. deviation=.954 Cohort 2 (n=16): Mean=2.19, Median=2, Mode=1, Std. deviation=1.047	2006	22%	31%	28%	31%	39%	25%	11%	13%
Making your course syllabi available to anyone on the Internet or other public sources									
Cohort 1 (n=47): Mean=2.85, Median=3, Mode=4, Std. deviation=1.083 Cohort 2 (n=16): Mean=3.06, Median=3.5, Mode=4, Std. deviation=1.063	2006	15%	6%	21%	31%	28%	13%	36%	50%

EXHIBIT 3-2 (Continued)
FACULTY SURVEY RESPONSES: COLLABORATION
YEAR 2

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.	Year	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
Preparing a portfolio or dossier to support your teaching performance									
Cohort 1 (n=47): Mean=2.21, Median=2, Mode=1, Std. deviation=1.062 Cohort 2 (n=16): Mean=2.25, Median=2, Mode=2, Std. deviation=1.183	2006	32%	31%	30%	38%	23%	6%	15%	25%
Working with an undergraduate to further inform your course design									
Cohort 1 (n=47): Mean=2.30, Median=2, Mode=1, Std. deviation=1.178 Cohort 2 (n=16): Mean=1.75, Median=1, Mode=1, Std. deviation=1.000	2006	36%	56%	19%	19%	23%	19%	21%	6%
Working with a Teaching Assistant to further inform your course design									
Cohort 1 (n=47): Mean=1.96, Median=1, Mode=1, Std. deviation=1.197 Cohort 2 (n=16): Mean=1.88, Median=1, Mode=1, Std. deviation=1.088	2006	55%	56%	11%	6%	17%	31%	17%	6%
Working with other faculty to further inform your course design									
Cohort 1 (n=46): Mean=2.48, Median=2.5, Mode=3, Std. deviation=.960 Cohort 2 (n=16): Mean=2.25, Median=2, Mode=2, Std. deviation=.856	2006	17%	19%	33%	44%	35%	31%	15%	6%
Working with consultants to further inform your course design									
Cohort 1 (n=47): Mean=2.26, Median=2, Mode=1, Std. deviation=1.188 Cohort 2 (n=16): Mean=1.75, Median=1.5, Mode=1, Std. deviation=.931	2006	38%	50%	19%	31%	21%	13%	21%	6%

Source: MGT Faculty Survey, February 2006.

Data from Exhibit 3-2 revealed the following statistically significant³ faculty opinions regarding collaboration at the beginning of Year 2:

- Forty (40) percent of faculty in Cohort 1 and 47 percent of faculty in Cohort 2 felt the desire to facilitate communication between students and instructors was a highly motivating factor in inspiring them to change their course design. An additional 43 and 47 percent, respectively, felt that the desire to facilitate this communication inspired them to a moderate degree to change their course design.
- Forty (40) percent of faculty in Cohort 1 revealed that they were highly motivated to change their course because of their desire to help students work more collaboratively, while only 7 percent of faculty in Cohort 2 believed this was a highly motivating factor to alter their course design. Thirty (30) and 53 percent, respectively,

³ The Statistical Package for the Social Sciences (SPSS) software was used to analyze the statistical importance of all survey data.

said they were moderately motivated by their desire to change their course design to help students work more collaboratively.

- Sixty-four (64) percent of faculty in Cohort 1, and over two-thirds (69%) of faculty in Cohort 2 said that they intended to use new collaborative strategies as a part of their work with the grant.
- Seven (7) and 13 percent of faculty in Cohorts 1 and 2, respectively, said that implementing team teaching or other collaborative approaches in courses was a high priority, and 26 and 19 percent, respectively, said this was a moderate priority. Fifty-seven (57) percent of faculty in Cohort 1 said that meeting informally with students outside of class, labs, or studios was a moderate to high priority as a part of their work with the grant while nearly two-thirds (63%) of faculty in Cohort 2 said this was a moderate to high priority for them.
- Nearly half (40%) of Cohort 1 faculty said that discussing course content, materials, assessment techniques, and the like were a high priority for them, and 45 percent indicated it was a moderate priority. Only 19 percent of faculty in Cohort 2 said this form of collaboration was a high priority, while 44 percent said it was a moderate priority. Only 22 and 19 percent of faculty in Cohorts 1 and 2, respectively, considered presenting their discipline in a colleague's class a moderate or high priority.
- Few faculty in either cohort (11% and 13%, respectively) indicated that inviting colleagues to review their syllabi or teaching materials was a high priority, while 39 and 25 percent, respectively, said it was a moderate priority. However, when faculty were asked to indicate the priority they would give to making their syllabi available on the Internet or through other public sources, over one-third (36%) of faculty in Cohort 1 said this was a high priority, as did half (50%) of the faculty in Cohort 2.
- Fifteen (15) percent of faculty in Cohort 1 said that preparing a portfolio or dossier to support their teaching performance was a high priority, as did 25 percent of faculty in Cohort 2.
- Only 21 and 6 percent of faculty in Cohorts 1 and 2, respectively, said that working with an undergraduate to further inform their course design was a high priority. Seventeen (17) and 6 percent, respectively, said they gave high priority to working with a Teaching Assistant to further inform their course design.
- Fifteen (15) and 6 percent of faculty in Cohorts 1 and 2, respectively, said working with other faculty to further inform their course design was a high priority. Similarly, 21 and 6 percent, respectively, said that working with consultants in this manner was a high priority.

Survey questions regarding collaboration can be grouped into the following categories—collaborating with students for the purpose of learning, collaborating with students to inform course redesign, and collaboration with colleagues. Based on the survey data, faculty gave a higher priority to collaborating with students for the purpose of learning, and the lowest priority to collaborating with colleagues.

Faculty completed course profiles at the end of Year 2. This included documenting how they used collaboration in their research projects. A summary of data reported on the profiles revealed the following at the system level:

- Faculty used student forums and small groups to facilitate learning and student collaboration.
- Almost all faculty participating in the grant collaborated with others within their departments, as well as networking with faculty from other departments and disciplines.
- All faculty participated in monthly or bi-monthly grant meetings/workshops, and in some instances met as small groups.
- Over three-fourths of faculty participants conducted focus groups with students to evaluate course design and discuss potential changes.
- Web-based conferencing was used to collaborate with faculty across the system participating in the Bush grant. Two Breeze sessions were arranged with faculty participants presenting from each campus.
- One faculty member reported collaborating with faculty in her discipline across the University of Minnesota via web-based conferencing.

Faculty, consultants, campus coordinators, and students involved with the grant were also asked about collaboration during the focus groups and interviews MGT conducted on each campus. The following were among the strongest sentiments expressed by participants in these data collection activities:

- Interviews and focus groups revealed that collaboration occurred among and between participating as well as non-participating faculty, consultants, staff, and students.
- Faculty and consultants reported that opportunities for group collaboration (times dedicated to interacting with other faculty and staff involved with projects) were universally appreciated by project participants on all campuses.
- Faculty participants generally expressed desire for more opportunities to meet with larger groups of participants.

- Individual, informal collaboration stimulated by project involvement (such as impromptu meetings to discuss methodologies, or other casual conversations among participating and non-participating faculty regarding research efforts) was also prevalent on each campus.
- Generally, faculty and consultants reported that collaboration was strongest within teams, while inter-team collaboration could be improved upon.
- Consultants highlighted efforts to construct project teams that would implicitly encourage interdisciplinary collaboration, while faculty appeared to appreciate the diversity of backgrounds involved in groups.
- Faculty indicated that interdisciplinary collaboration helped to fill holes (i.e., support weaknesses) in faculty knowledge/awareness in terms of their general understanding of pedagogical research or assessment and evaluation.
- Discussions with faculty as well as consultants revealed that collaboration between campuses occurred to a limited degree through opportunities like the Breeze sessions and resulting dialogues, but was not consistent or prominent among participating faculty.
- Faculty reported that collaboration between faculty extended beyond project participants in many cases, as course refinements affected student knowledge related to subsequent or otherwise related coursework, encouraging and/or necessitating discussions with faculty whose students would be impacted.
- Faculty reported that meetings with larger groups of faculty were helpful to many as a means of generating new ideas for projects and solutions to problems.
- Faculty and consultants reported that collaboration with other faculty helped participants refine ideas and approaches.
- Many faculty expressed the sentiment that Bush grant activities served as a catalyst to promote interdisciplinary collaboration that previously did not exist or existed only to a limited extent.
- Faculty and consultants reported instances of the first cohort of faculty participants (or other faculty with expertise in technologies, interventions, or assessment and evaluation) mentoring members of the second cohort of faculty in the use, implementation, and assessment and evaluation of methods.

- Faculty and consultants reported that students sometimes were relied upon to enhance collaboration by carrying ideas between participants.
- Consultants reported that collaboration with students appears to be an evolving process that is becoming more important as the grant progresses, as roles that students can fill to assist in grant efforts become clearer.
- Varying structures across campuses and between groups on campuses leads to differing modes of collaboration (horizontal versus hierarchical team structures).

To what extent did program participants use a scholarly approach to teaching?

Exhibit 3-3 presents the Year 2 survey data on following faculty views on using a scholarly approach to teaching systemwide.

**EXHIBIT 3-3
FACULTY SURVEY RESPONSES: SCHOLARSHIP
YEAR 2**

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.	Year	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
Using interdisciplinary knowledge to inform your course design									
Cohort 1 (n=47): Mean=2.66, Median=3, Mode=3, Std. deviation=.915 Cohort 2 (n=16): Mean=2.69, Median=3, Mode=2, Std. deviation=1.014	2006	13%	13%	26%	31%	45%	31%	17%	25%
Updating your knowledge of your discipline									
Cohort 1 (n=47): Mean=3.28, Median=4, Mode=4, Std. deviation=.852 Cohort 2 (n=16): Mean=3.31, Median=3, Mode=3, Std. deviation=.704	2006	2%	0%	19%	13%	28%	44%	51%	44%
Participating in conferences, seminars, or workshops on teaching or student learning									
Cohort 1 (n=47): Mean=2.96, Median=3, Mode=3, Std. deviation=.806 Cohort 2 (n=16): Mean=2.88, Median=3, Mode=3, Std. deviation=1.025	2006	2%	13%	28%	19%	43%	38%	28%	31%

Source: MGT Faculty Survey, February 2006.

Data from Exhibit 3-3 revealed the following significant faculty opinions regarding scholarship at the beginning of Year 2:

- Seventeen (17) and 25 percent of faculty in Cohorts 1 and 2, respectively, said that using interdisciplinary knowledge to inform their course design was a high priority, and 45 and 31 percent, respectively, said this was a moderate priority.
- Over half (51%) of faculty in Cohort 1 said that updating their knowledge of their discipline was a high priority as did 44 percent of faculty in Cohort 2. An additional 13% and 28% of in both cohorts, respectively, said this was a moderate priority.
- Nearly a third of faculty participants in both cohorts (28% and 31%, respectively) indicated that participating in conferences, seminars, or workshops on teaching or student learning was a high priority. Forty-three (43) percent of faculty in Cohort 1 said this was a moderate priority as did 38 percent of Cohort 2 participants.

Course profiles completed by Bush grant faculty at the end of Year 2 documented how they used a scholarly approach to teaching. Data analysis of these documents revealed the following at the system level.

- Faculty made presentations to colleagues to summarize and reveal outcomes of research (including ITV meetings systemwide and local campus workshops).
- Participants applied to and presented at regional, state, and national conferences/meetings, with an additional presentation conducted at an international conference.
- Literature reviews and white papers were written and submitted for publication.
- Faculty used articles to identify other teaching methods and ways to improve teaching to impact student learning.
- Participants developed experimental design(s), administered attendance quizzes, conducted student surveys and/or focus groups, conducted pre- and post- exams, assessed learning styles and adjusted teaching methods, utilized web-based instruction, and employed other various innovative teaching strategies.

A list of all presentations and publications resulting from Bush grant efforts is maintained by the University of Minnesota's Center for Teaching and Learning on the Twin Cities campus, and is available through the grant website. This list is also included in Appendix E of this report.

Project participants and administrators on each campus were also asked about using a scholarly approach to teaching during the fall site visits. Findings from focus groups and interviews included the following:

- Scholarship was embraced to varying degrees across projects and among participants.

- Varying models of research collection research existed among campuses as well as among teams on the same campus.
- Select resources were supplied at the central level on each of the campuses.
- Some faculty participants engaged exclusively in their own research into teaching methods, up to and including performing extensive literature reviews in their project areas.
- Other faculty relied on consultants, coordinators, and/or students to supply varying portions of the research used to inform their projects.
- Faculty/teams shared research with one another at larger meetings.
- Several faculty participants indicated that the grant offered an introduction to the entire concept of scholarship of teaching, or introduced them to scholarly teaching journals within their disciplines.
- Faculty that have achieved the most concrete results have developed presentations/publications about their research efforts.
- Participants expressed the sentiment that knowledge gained from research projects was being disseminated among colleagues, at the very least, or in other cases, well beyond the confines of their campus (via publications or presentations at regional/national conferences).

To what extent did program participants change their attitude towards using a collaborative and scholarly approach to teaching?

Cohort 1 faculty have participated in the Bush grant for the past two years. As a result, survey data collected at the beginning of Year 2 can be compared with data from Year 1 to measure a two-year change in attitude towards using a collaborative and scholarly approach to teaching. Exhibit 3-4 shows this year-to-year comparison along with the data collected from faculty in Cohort 2.

**EXHIBIT 3-4
FACULTY SURVEY RESPONSES: COLLABORATION AND SCHOLARSHIP
YEAR 1 AND 2 COMPARISON**

Over the past year, to what degree has each of the following factors motivated you to change your course?	Years	% of Respondents								
		None		Low		Moderate		High		
		C1	C2	C1	C2	C1	C2	C1	C2	
Desire to facilitate communication between students and instructors										
Cohort 1 (n=63): Mean=3.40, Median=4, Mode=4, Std. deviation=.708	2005	--	--	13%	--	35%	--	52%	--	
Cohort 1 (n=47): Mean=3.23, Median=3, Mode=3, Std. deviation=.729 Cohort 2 (n=15): Mean=3.40, Median=3, Mode=3, Std. deviation=.632	2006	0%	0%	17%	7%	43%	47%	40%	47%	

EXHIBIT 3-4 (Continued)
FACULTY SURVEY RESPONSES: COLLABORATION AND SCHOLARSHIP
YEAR 1 AND 2 COMPARISON

Over the past year, to what degree has each of the following factors motivated you to change your course?	Years	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
Desire to help students work more collaboratively									
Cohort 1 (n=63): Mean=2.98, Median=3, Mode=3, Std. deviation=.871	2005	5%	--	24%	--	40%	--	32%	--
Cohort 1 (n=47): Mean=3.23, Median=3, Mode=3, Std. deviation=.729 Cohort 2 (n=15): Mean=3.40, Median=3, Mode=3, Std. deviation=.632	2006	4%	0%	26%	40%	30%	53%	40%	7%
For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.	Years	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
Informally studying the effects of your teaching on student learning									
Cohort 1 (n=62): Mean=3.11, Median=3, Mode=3, Std. deviation=.812	2005	3%	--	18%	--	44%	--	36%	--
Cohort 1 (n=47): Mean=2.96, Median=3, Mode=3, Std. deviation=.806 Cohort 2 (n=16): Mean=2.81, Median=3, Mode=3, Std. deviation=.750	2006	4%	0%	21%	38%	49%	44%	26%	19%
Using interdisciplinary knowledge to inform your course design									
Cohort 1 (n=63): Mean=2.89, Median=3, Mode=3, Std. deviation=.918	2005	8%	--	24%	--	40%	--	29%	--
Cohort 1 (n=47): Mean=2.66, Median=3, Mode=3, Std. deviation=.915 Cohort 2 (n=16): Mean=2.69, Median=3, Mode=2, Std. deviation=1.014	2006	13%	13%	26%	31%	45%	31%	17%	25%
Implementing team teaching or other collaborative approaches in courses									
Cohort 1 (n=63): Mean=2.14, Median=2, Mode=2, Std. deviation=.965	2005	30%	--	35%	--	25%	--	10%	--
Cohort 1 (n=46): Mean=2.02, Median=2, Mode=1, Std. deviation=.954 Cohort 2 (n=16): Mean=1.94, Median=1.5, Mode=1, Std. deviation=1.124	2006	37%	50%	31%	19%	26%	19%	7%	13%
Updating your knowledge of your discipline									
Cohort 1 (n=62): Mean=3.37, Median=4, Mode=4, Std. deviation=1.044	2005	10%	--	13%	--	8%	--	69%	--
Cohort 1 (n=47): Mean=3.28, Median=4, Mode=4, Std. deviation=.852 Cohort 2 (n=16): Mean=3.31, Median=3, Mode=3, Std. deviation=.704	2006	2%	0%	19%	13%	28%	44%	51%	44%
Meeting informally with students outside of class, labs, or studios									
Cohort 1 (n=62): Mean=2.69, Median=3, Mode=3, Std. deviation=1.065	2005	18%	--	23%	--	32%	--	27%	--
Cohort 1 (n=46): Mean=2.65, Median=3, Mode=3, Std. deviation=.924 Cohort 2 (n=16): Mean=2.88, Median=3, Mode=4, Std. deviation=1.088	2006	11%	13%	33%	25%	37%	25%	20%	38%

EXHIBIT 3-4 (Continued)
FACULTY SURVEY RESPONSES: COLLABORATION AND SCHOLARSHIP
YEAR 1 AND 2 COMPARISON

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.	Years	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
Discussing with colleagues your course content, materials, assessment techniques, and the like									
Cohort 1 (n=63): Mean=3.25, Median=3, Mode=4, Std. deviation=.761	2005	2%	--	14%	--	41%	--	43%	--
Cohort 1 (n=47): Mean=3.26, Median=3, Mode=3, Std. deviation=.706 Cohort 2 (n=16): Mean=2.69, Median=3, Mode=3, Std. deviation=.946	2006	0%	13%	15%	25%	45%	44%	40%	19%
Participating in conferences, seminars, or workshops on teaching or student learning									
Cohort 1 (n=63): Mean=3.19, Median=3, Mode=3, Std. deviation=.780	2005	2%	--	18%	--	41%	--	40%	--
Cohort 1 (n=47): Mean=2.96, Median=3, Mode=3, Std. deviation=.806 Cohort 2 (n=16): Mean=2.88, Median=3, Mode=3, Std. deviation=1.025	2006	2%	13%	28%	19%	43%	38%	28%	31%
Presenting on your discipline in a colleague's class									
Cohort 1 (n=62): Mean=2.31, Median=2, Mode=2, Std. deviation=.879	2005	19%	--	36%	--	34%	--	8%	--
Cohort 1 (n=47): Mean=1.87, Median=2, Mode=1, Std. deviation=.992 Cohort 2 (n=16): Mean=1.81, Median=1.5, Mode=1, Std. deviation=1.047	2006	45%	50%	34%	31%	11%	6%	11%	13%
Inviting colleagues to review your syllabi or teaching materials									
Cohort 1 (n=62): Mean=2.69, Median=3, Mode=3, Std. deviation=.985	2005	16%	--	19%	--	44%	--	21%	--
Cohort 1 (n=46): Mean=2.39, Median=2.5, Mode=3, Std. deviation=.954 Cohort 2 (n=16): Mean=2.19, Median=2, Mode=1, Std. deviation=1.047	2006	22%	31%	28%	31%	39%	25%	11%	13%
Making your course syllabi available to anyone on the Internet or other public sources									
Cohort 1 (n=62): Mean=2.85, Median=3, Mode=4, Std. deviation=1.053	2005	15%	--	19%	--	32%	--	34%	--
Cohort 1 (n=47): Mean=2.85, Median=3, Mode=4, Std. deviation=1.083 Cohort 2 (n=16): Mean=3.06, Median=3.5, Mode=4, Std. deviation=1.063	2006	15%	6%	21%	31%	28%	13%	36%	50%
Preparing a portfolio or dossier to support your teaching performance									
Cohort 1 (n=62): Mean=2.55, Median=3, Mode=2, Std. deviation=1.051	2005	19%	--	29%	--	29%	--	23%	--
Cohort 1 (n=47): Mean=2.21, Median=2, Mode=1, Std. deviation=1.062 Cohort 2 (n=16): Mean=2.25, Median=2, Mode=2, Std. deviation=1.183	2006	32%	31%	30%	38%	23%	6%	15%	25%

EXHIBIT 3-4 (Continued)
FACULTY SURVEY RESPONSES: COLLABORATION AND SCHOLARSHIP
YEAR 1 AND 2 COMPARISON

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.	Years	% of Respondents								
		None		Low		Moderate		High		
		C1	C2	C1	C2	C1	C2	C1	C2	
Working with an undergraduate to further inform your course design										
Cohort 1 (n=61): Mean=2.52, Median=3, Mode=3, Std. deviation=1.134	2005	27%	--	20%	--	30%	--	25%	--	
Cohort 1 (n=47): Mean=2.30, Median=2, Mode=1, Std. deviation=1.178 Cohort 2 (n=16): Mean=1.75, Median=1, Mode=1, Std. deviation=1.000	2006	36%	56%	19%	19%	23%	19%	21%	6%	
Working with a Teaching Assistant to further inform your course design										
Cohort 1 (n=61): Mean=2.13, Median=2, Mode=1, Std. deviation=1.132	2005	41%	--	21%	--	21%	--	16%	--	
Cohort 1 (n=47): Mean=1.96, Median=1, Mode=1, Std. deviation=1.197 Cohort 2 (n=16): Mean=1.88, Median=1, Mode=1, Std. deviation=1.088	2006	55%	56%	11%	6%	17%	31%	17%	6%	
Working with other faculty to further inform your course design										
Cohort 1 (n=61): Mean=2.90, Median=3, Mode=3, Std. deviation=.978	2005	10%	--	23%	--	34%	--	33%	--	
Cohort 1 (n=46): Mean=2.48, Median=2.5, Mode=3, Std. deviation=.960 Cohort 2 (n=16): Mean=2.25, Median=2, Mode=2, Std. deviation=.856	2006	17%	19%	33%	44%	35%	31%	15%	6%	
Working with consultants to further inform your course design										
Cohort 1 (n=61): Mean=2.20, Median=2, Mode=1, Std. deviation=1.093	2005	34%	--	28%	--	21%	--	16%	--	
Cohort 1 (n=47): Mean=2.26, Median=2, Mode=1, Std. deviation=1.188 Cohort 2 (n=16): Mean=1.75, Median=1.5, Mode=1, Std. deviation=.931	2006	38%	50%	19%	31%	21%	13%	21%	6%	

Source: MGT Faculty Surveys, February 2005 and 2006.

As shown in Exhibit 3-4, there has been little change in faculty's attitude towards using a collaborative and scholarly approach to teaching. However, it is important to note that the faculty viewed collaboration and scholarship in teaching as important from the beginning, so little change was anticipated. In some instances, faculty perceptions were not as high in Year 2 as they were in Year 1, as noted by the decreases. Additionally, as with any longitudinal project, little change to be expected over the first years.

Statistical analysis of the survey data revealed the following significant changes for Cohort 1 faculty from Year 1 to Year 2:

- In Year 1, 32 percent of Cohort 1 participants said that the desire to help students work more collaboratively was a highly motivating factor in inspiring them to change their course design. In Year 2, the percentage rose eight percentage points to 40 percent.

- Eighty-six (86) percent of Cohort 1 participants in Year 1 reported that they intended to develop new instructional strategies as part of their work with the Bush grant as compared to 89 percent in Year 2.
- Seventy-nine (79) percent of Cohort 1 participants said that using information in their course(s) from recent articles, books, or topics was a moderate to high priority in Year 1. In Year 2, the percentage rose to 87 percent, an increase of eight percentage points.
- In Year 1, over three-fourths (76%) of Cohort 1 faculty said that it was a moderate to high priority for them to take into account differences among students in how they learn. This percentage increased three points in Year 2 to 79 percent.
- Updating their knowledge of their discipline was a moderate to high priority for 77 percent of Cohort 1 faculty in Year 1, and 79 percent in Year 2.
- Sixteen (16) percent of Cohort 1 faculty in Year 1 and 21 percent in Year 2 said that working with consultants to further inform their course design was a high priority, an increase of five percentage points.

Participants in focus groups and interviews conducted during MGT's visits to each campus indicated substantial changes in attitudes towards the concepts of scholarship and collaboration as they relate to teaching. Findings relative to this aspect of data collection activities include the following:

- Ideas of scholarship and collaboration were embraced by participants to varying degrees and with some differences in interpretation/understanding.
- Consultants generally reported increased buy-in and understanding of concepts and importance with time among clients, as they became further invested in projects.
- Faculty almost universally appreciated opportunities to meet to share ideas and learn about problems colleagues encountered in implementing methods.
- Many faculty have developed a new appreciation for the ways in which their colleagues can assist them in their teaching efforts, and previously had limited opportunities to interact in this manner with faculty outside of their discipline (prior to involvement with the Bush grant).
- Though nearly all faculty appreciated the concept of a scholarly approach to teaching, some reported that time limitations impeded their ability to conduct their own research into teaching methods (scholarship), requiring them to rely exclusively on efforts of consultants or students.

- Several faculty have adopted rigorous mechanisms to track the effectiveness of interventions/teaching methods to allow for almost immediate refinement of approaches.
- Consultants reported that overall and individual morale improved as faculty were able to bring their research efforts to fruition (that is, the formalization of findings from research seemed to enhance appreciation for efforts, including aspects of scholarship and collaboration).

Based upon survey results, information submitted in course profiles, and interviews conducted with consultants, faculty, and students, it would appear that various modes of collaboration and scholarship have played prominent roles in grant proceedings across the system. Regarding collaboration, while some inconsistencies in definitions or understanding still exist, and some gaps in opportunities were cited by participating faculty, it is evident that all grant participants have seen an increase in experiences working with others as part of the development, implementation, and assessment and evaluation stages of their grant work. Additionally, understandings of the scholarship of teaching among participants has evolved substantially, with some faculty gaining their first introduction to the concept, while others have significantly advanced their understandings of how to employ the ideals of scholarship in refining their teaching methodologies as well as disseminating their findings to others in their fields. Increased appreciation for both of these aspects of the grant – collaboration and scholarship – is apparent among almost all participants.

3.3 Assessment and Evaluation of Student Learning

As previously mentioned, data were collected from faculty surveys, course profile updates, and on-site focus groups to determine how faculty were using assessment and evaluation of student learning to inform course design/redesign. Information gathered from consultants and campus coordinators was used as an additional reference. Data collected addressed the following research questions:

- How did participants assess student learning?
- How was assessment information used to inform course design/redesign?

How did participants assess student learning?

A section of the faculty survey conducted at the beginning of Year 2 focused on how grant participants had assessed or planned to assess student learning over the previous year. Data collected from this section of the survey are presented in Exhibit 3-5.

**EXHIBIT 3-5
FACULTY SURVEY RESPONSES: ASSESSMENT OF STUDENT LEARNING
YEARS 1 AND 2**

How often have you used the following forms of assessment over the past year?	Year	% of Respondents							
		Never		Sometimes		Often		Very Often	
		C1	C2	C1	C2	C1	C2	C1	C2
Interactive techniques (e.g., voting, debates, small group problem-solving)									
Cohort 1 (n=63): Mean=2.57, Median=2, Mode=2, Std. deviation=.962	2005	10%	--	48%	--	19%	--	24%	--
Cohort 1 (n=46): Mean=2.74, Median=3, Mode=2, Std. deviation=1.021 Cohort 2 (n=15): Mean=2.80, Median=3, Mode=3, Std. deviation=1.082	2006	11%	20%	35%	7%	24%	47%	30%	27%
Qualitative methods (e.g., journals, reflection papers, essays, short answer)									
Cohort 1 (n=63): Mean=2.57, Median=3, Mode=3, Std. deviation=1.043	2005	19%	--	27%	--	32%	--	22%	--
Cohort 1 (n=47): Mean=2.40, Median=2, Mode=2, Std. deviation=.970 Cohort 2 (n=15): Mean=2.33, Median=2, Mode=2, Std. deviation=.900	2006	19%	13%	36%	53%	30%	20%	15%	13%
Quantitative methods (e.g., quizzes or tests, surveys)									
Cohort 1 (n=63): Mean=3.40, Median=4, Mode=4, Std. deviation=.853	2005	6%	--	5%	--	32%	--	57%	--
Cohort 1 (n=47): Mean=3.32, Median=3, Mode=4, Std. deviation=.783 Cohort 2 (n=15): Mean=3.47, Median=4, Mode=4, Std. deviation=.743	2006	2%	0%	13%	13%	36%	27%	49%	60%
Anonymous student response techniques									
Cohort 1 (n=62): Mean=2.24, Median=2, Mode=2, Std. deviation=.803	2005	15%	--	55%	--	23%	--	8%	--
Cohort 1 (n=47): Mean=2.21, Median=2, Mode=2, Std. deviation=.954 Cohort 2 (n=15): Mean=2.07, Median=2, Mode=2, Std. deviation=.884	2006	21%	27%	51%	47%	13%	20%	15%	7%
Identified student response techniques									
Cohort 1 (n=60): Mean=1.95, Median=2, Mode=2, Std. deviation=.852	2005	35%	--	38%	--	23%	--	3%	--
Cohort 1 (n=46): Mean=2.20, Median=2, Mode=2, Std. deviation=.980 Cohort 2 (n=15): Mean=2.00, Median=2, Mode=1, Std. deviation=1.069	2006	26%	40%	41%	33%	20%	13%	13%	13%
Un-graded performance measures									
Cohort 1 (n=62): Mean=2.27, Median=2, Mode=2, Std. deviation=.908	2005	19%	--	45%	--	24%	--	11%	--
Cohort 1 (n=47): Mean=2.30, Median=2, Mode=2, Std. deviation=.976 Cohort 2 (n=15): Mean=2.20, Median=2, Mode=2, Std. deviation=1.014	2006	21%	27%	43%	40%	21%	20%	15%	13%
Graded performance measures									
Cohort 1 (n=63): Mean=3.57, Median=4, Mode=4, Std. deviation=.615	2005	--	--	6%	--	30%	--	64%	--
Cohort 1 (n=46): Mean=3.37, Median=3, Mode=4, Std. deviation=.679 Cohort 2 (n=15): Mean=3.00, Median=3, Mode=3, Std. deviation=.926	2006	0%	7%	11%	20%	41%	40%	48%	33%

EXHIBIT 3-5 (Continued)
FACULTY SURVEY RESPONSES: ASSESSMENT OF STUDENT LEARNING
YEARS 1 AND 2

How often have you used the following forms of assessment over the past year?	Year	% of Respondents							
		Never		Sometimes		Often		Very Often	
		C1	C2	C1	C2	C1	C2	C1	C2
Voluntary measures of performance									
Cohort 1 (n=60): Mean=1.85, Median=2, Mode=1, Std. deviation=.880	2005	43%	--	32%	--	22%	--	3%	--
Cohort 1 (n=46): Mean=1.96, Median=2, Mode=1, Std. deviation=.918 Cohort 2 (n=15): Mean=1.73, Median=2, Mode=1, Std. deviation=.799	2006	37%	47%	37%	33%	20%	20%	7%	0%
Required measures of performance									
Cohort 1 (n=60): Mean=3.13, Median=3, Mode=3, Std. deviation=.911	2005	8%	--	10%	--	42%	--	40%	--
Cohort 1 (n=46): Mean=3.17, Median=3.5, Mode=4, Std. deviation=.973 Cohort 2 (n=15): Mean=3.00, Median=3, Mode=3, Std. deviation=.926	2006	7%	7%	20%	50%	24%	40%	50%	33%
Individual student performance									
Cohort 1 (n=63): Mean=3.35, Median=4, Mode=4, Std. deviation=.883	2005	8%	--	3%	--	35%	--	54%	--
Cohort 1 (n=46): Mean=3.24, Median=3.5, Mode=4, Std. deviation=.947 Cohort 2 (n=15): Mean=3.13, Median=3, Mode=3, Std. deviation=.743	2006	9%	0%	9%	20%	33%	47%	50%	33%
Group performance									
Cohort 1 (n=62): Mean=2.42, Median=2, Mode=2, Std. deviation=1.017	2005	19%	--	39%	--	23%	--	19%	--
Cohort 1 (n=45): Mean=2.27, Median=2, Mode=2, Std. deviation=.939 Cohort 2 (n=15): Mean=2.07, Median=2, Mode=1, Std. deviation=1.100	2006	22%	40%	40%	27%	27%	20%	11%	13%

Source: MGT Faculty Surveys, February 2005 and 2006.

From Exhibit 3-5, the following statistically significant highlights emerged between Year 1 and 2 for faculty in Cohorts 1 and 2:

- Twenty-four (24) percent of Cohort 1 faculty reported using interactive techniques such as voting, debates, or small group problem-solving very often in Year 1, and 30 percent used them very often in Year 2. Twenty-seven (27) percent of Cohort 2 faculty reported using these techniques very often in Year 2.
- Anonymous student response techniques were used very often by 8 percent of faculty in Cohort 1 during Year 1 and by 15 percent in Year 2. Only 7 percent of faculty in Cohort 2 reported using these techniques in Year 2.
- Only 3 percent of faculty in Cohort 1 reported using identified student response techniques very often in Year 1, as compared to 13

percent in Year 2. Thirteen (13) percent of faculty in Cohort 2 reported using these systems very often.

- Un-graded performance measures were used very often by 11 percent of Cohort 1 faculty in Year 1 and by 15 percent of these faculty participants in Year 2. Again, 13 percent of Cohort 2 reported using this assessment technique very often.
- A very small percentage, 3 percent, of faculty in Cohort 1 reported using voluntary measures of performance very often in Year 1. This increased by four percentage points in Year 2, to 7 percent. None of the Cohort 2 participants reported using these measures very often, and nearly half (47%) reported never using them.
- Required measures of performance were used very often by 40 percent of Cohort 1 faculty in Year 1, and by 50 percent in Year 2. Only one-third (33%) of faculty in Cohort 2 reported using these required measures very often in Year 2.
- Eighty-six (86) percent of Cohort 1 faculty said that using a variety of techniques in assessing student learning in their courses was a moderate to high priority. This increased four percentage points to 90 percent for this faculty group in Year 2. Sixty-eight (68) percent of Cohort 2 faculty said this was a moderate to high priority.

In summary, the data reveals that faculty use graded or quantitative methods (quizzes, tests, etc.) to assess student learning more than qualitative methods (journals, reflection papers, essays, etc.). Similarly, required measures of performance were used to assess learning more than voluntary measures. Faculty were also more prone to assess students on individual performance than outcomes from groups.

The survey also asked faculty to rate the importance of assessing of student knowledge in improving student learning. Data collected from this section of the survey are presented in Exhibit 3-6.

**EXHIBIT 3-6
FACULTY SURVEY RESPONSES: ASSESSMENT OF STUDENT KNOWLEDGE
YEARS 1 AND 2**

In the past year, how important have the following been for improving student learning?	Year	% of Respondents							
		None		Little		Somewhat		Very	
		C1	C2	C1	C2	C1	C2	C1	C2
Collecting information to assess students' entry-level knowledge or abilities									
Cohort 1 (n=63): Mean=2.81, Median=3, Mode=3, Std. deviation=1.05	2005	16%	--	18%	--	37%	--	30%	--
Cohort 1 (n=48): Mean=3.06, Median=3, Mode=3, Std. deviation=.861 Cohort 2 (n=15) Mean=2.53, Median=3, Mode=3, Std. deviation=.990	2006	8%	20%	8%	20%	52%	47%	31%	13%

EXHIBIT 3-6 (Continued)
FACULTY SURVEY RESPONSES: ASSESSMENT OF STUDENT KNOWLEDGE
YEARS 1 AND 2

In the past year, how important have the following been for improving student learning?	Year	% of Respondents							
		None		Little		Somewhat		Very	
		C1	C2	C1	C2	C1	C2	C1	C2
Collecting information to diagnose learning problems or identify individuals who need extra help									
Cohort 1 (n=62): Mean=2.77, Median=3, Mode=3, Std. deviation=.990	2005	13%	--	24%	--	36%	--	27%	--
Cohort 1 (n=48): Mean=2.44, Median=2.5, Mode=3, Std. deviation=.796 Cohort 2 (n=15): Mean=2.73, Median=2, Mode=2, Std. deviation=1.03	2006	13%	7%	38%	47%	44%	13%	6%	33%
Using classroom assessment strategies to prompt student thinking during lecture or class discussion									
Cohort 1 (n=63): Mean=3.24, Median=3, Mode=4, Std. deviation=.946	2005	10%	--	6%	--	35%	--	49%	--
Cohort 1 (n=48): Mean=3.46, Median=4, Mode=4, Std. deviation=.743 Cohort 2 (n=15): Mean=3.47, Median=4, Mode=4, Std. deviation=.915	2006	2%	7%	8%	7%	31%	20%	58%	67%
Helping students learn to assess their own progress									
Cohort 1 (n=63): Mean=2.97, Median=3, Mode=4, Std. deviation=.967	2005	6%	--	29%	--	27%	--	38%	--
Cohort 1 (n=47): Mean=2.85, Median=3, Mode=3, Std. deviation=.834 Cohort 2 (n=15): Mean=2.93, Median=3, Mode=3, Std. deviation=.799	2006	6%	0%	23%	33%	49%	40%	21%	27%
Motivating students to improve their study skills									
Cohort 1 (n=63): Mean=3.45, Median=4, Mode=4, Std. deviation=.737	2005	3%	--	5%	--	35%	--	57%	--
Cohort 1 (n=48): Mean=3.44, Median=4, Mode=4, Std. deviation=.796 Cohort 2 (n=15): Mean=3.27, Median=4, Mode=4, Std. deviation=.961	2006	2%	7%	13%	13%	25%	27%	60%	53%
Getting a better sense of what the class as a group is learning									
Cohort 1 (n=63): Mean=3.40, Median=4, Mode=4, Std. deviation=.814	2005	3%	--	11%	--	29%	--	57%	--
Cohort 1 (n=47): Mean=3.38, Median=3, Mode=4, Std. deviation=.677 Cohort 2 (n=15): Mean=3.47, Median=4, Mode=4, Std. deviation=.640	2006	0%	0%	11%	7%	40%	40%	49%	53%

Source: MGT Faculty Surveys, February 2005 and 2006.

From Exhibit 3-6, the following significant highlights emerged between Year 1 and 2 for faculty in Cohorts 1 and 2:

- Collecting information to assess students' entry-level knowledge or abilities was very important to 31 percent of faculty in Cohort 1 and 13 percent of faculty in Cohort 2 at the beginning of Year 2. In Year 2, nearly three-fourths (83%) of faculty in Cohort 1 said that assessing entry-level knowledge was somewhat to very important, a 16 point increase over Year 1.

- In Year 2, over half (58%) of Cohort 1 faculty said it was very important to use classroom assessment strategies to prompt student thinking during lecture or class discussion, a nine percentage point increase from Year 1. Over two-thirds (67%) of faculty in Cohort 2 said using these assessment strategies was very important.
- Helping students learn to assess their own progress was said to be somewhat to very important by 65 percent of faculty in Cohort 1 in Year 1. In Year 2, this percentage increased five percentage points to 70 percent for these faculty. Sixty-seven (67) percent of faculty in Cohort 2 viewed helping students assess their own progress as somewhat to very important.
- Sixty (60) percent of faculty in Cohort 1 at the beginning of Year 2 believed that motivating student to improve their study skills was very important, a 3 point increase over Year 1. Over half (53%) of faculty in Cohort 2 said this motivation was very important.

From the faculty survey responses received in Year 2, faculty felt that motivating students to improve study skills, using classroom assessment to prompt student thinking, and understanding what the class as a group are learning were the most important for improving student learning. Faculty believed that collecting entry level knowledge, identifying student who need extra help, and helping students assess their own progress were the least important.

Grant participants described assessment and evaluation techniques and strategies during MGT's on-site visits. Some highlights from interviews and focus groups conducted on each campus in the fall:

- A wide range of assessment and evaluation methods and tools were referenced by participants, including:
 - pre- and post-surveys of student attitudes (paper or online),
 - learning style inventories,
 - personal response systems,
 - interviews and focus groups with students,
 - peer (student) evaluations,
 - rigorous statistical models (experiment versus control),
 - course outcomes/competency assessments,
 - student portfolios,
 - monitoring course website activity/participation,
 - student reflections, and
 - anecdotal interaction with students.
- The Crookston campus's recent subscription to the Flashlight program is expected to be a valuable tool to supplement assessment and evaluation efforts on that campus as well as other campuses that desire to make use of this resource.
- Faculty have embraced these concepts to varying extents, with some opting to engage in extensive, quantitative methods to assess

effectiveness of course interventions and others relying on similarly intensive but more qualitative methods. A small portion of participants rely exclusively on informal feedback.

- Among those not engaged in extensive, formalized mechanisms, the resistance to adopting more rigorous assessment practices may be due to concerns over invasiveness, merit, or even the relative cost of time invested in such efforts in class (versus additional teaching).

How was assessment information used to inform course design/redesign?

Several questions on the faculty survey conducted at the beginning of Year 2 focused on how grant participants used information collected from assessments to inform course design/redesign. Data collected from this section of the survey are presented in Exhibit 3-7.

EXHIBIT 3-7 FACULTY SURVEY RESPONSES: USE OF ASSESSMENT DATA TO MAKE COURSE CHANGES YEARS 1 AND 2

In the past year, how important have the following been for improving student learning?	Years	% of Respondents							
		None		Little		Somewhat		Very	
		C1	C2	C1	C2	C1	C2	C1	C2
Using assessment strategies to help make mid-course corrections in teaching strategies or materials									
Cohort 1 (n=63): Mean=3.13, Median=3, Mode=4, Std. deviation=.959	2005	8%	--	16%	--	32%	--	44%	--
Cohort 1 (n=47): Mean=3.17, Median=3, Mode=4, Std. deviation=.816 Cohort 2 (n=15): Mean=2.87, Median=3, Mode=3, Std. deviation=.915	2006	2%	7%	19%	27%	38%	40%	40%	27%
Using feedback to improve mid-term or final exams									
Cohort 1 (n=60): Mean=3.15, Median=3, Mode=3, Std. deviation=.820	2005	3%	--	17%	--	42%	--	38%	--
Cohort 1 (n=48): Mean=2.90, Median=3, Mode=3, Std. deviation=1.016 Cohort 2 (n=15): Mean=3.00, Median=3, Mode=4, Std. deviation=1.069	2006	13%	13%	19%	13%	35%	33%	33%	40%
Using student feedback to evaluate the overall course									
Cohort 1 (n=63): Mean=3.29, Median=4, Mode=4, Std. deviation=1.038	2005	5%	--	3%	--	25%	--	67%	--
Cohort 1 (n=48): Mean=3.58, Median=4, Mode=4, Std. deviation=.647 Cohort 2 (n=15): Mean=3.53, Median=4, Mode=4, Std. deviation=.640	2006	2%	0%	2%	7%	31%	33%	65%	60%
Informally studying the effects of your teaching on student learning									
Cohort 1 (n=62): Mean=3.11, Median=3, Mode=3, Std. deviation=.812	2005	3%	--	18%	--	44%	--	36%	--
Cohort 1 (n=47): Mean=2.96, Median=3, Mode=3, Std. deviation=.806 Cohort 2 (n=16): Mean=2.81, Median=3, Mode=3, Std. deviation=.750	2006	4%	0%	21%	38%	49%	44%	26%	19%

EXHIBIT 3-7 (Continued)
FACULTY SURVEY RESPONSES: USE OF ASSESSMENT
DATA TO MAKE COURSE CHANGES
YEARS 1 AND 2

In the past year, how important have the following been for improving student learning?	Years	% of Respondents							
		None		Little		Somewhat		Very	
		C1	C2	C1	C2	C1	C2	C1	C2
Using comments from students to alter teaching practices or materials									
Cohort 1 (n=63): Mean=3.27, Median=3, Mode=4, Std. deviation=.787	2005	3%	--	11%	--	41%	--	44%	--
Cohort 1 (n=47): Mean=3.34, Median=3, Mode=4, Std. deviation=.700 Cohort 2 (n=16): Mean=2.94, Median=3, Mode=3, Std. deviation=.772	2006	0%	0%	13%	31%	40%	44%	47%	25%

Source: MGT Faculty Surveys, February 2005 and 2006.

From Exhibit 3-7, the following statically significant highlights emerged between Year 1 and 2 for faculty in Cohorts 1 and 2.

- In Year 2, using assessment strategies to help make mid-course corrections in teaching strategies or materials was said to be very important by 40 percent of faculty in Cohort 1 and 27 percent of faculty in Cohort 2. In Year 1, over three-fourths (76%) of faculty in Cohort 1 said that using assessment strategies for mid-course corrections was somewhat to very important. In Year 2, this percentage increased two points to 78 percent.
- Using feedback to improve mid-term or final exams was said to be very important by one-third (33%) of faculty in Cohort 1 and 40 percent of Cohort 2 participants in Year 2. An additional 35 and 33 percent of faculty, respectively, said this was somewhat important.
- In Year 2 nearly two-thirds of faculty in Cohorts 1 and 2 (65% and 60%, respectively) said that using student feedback to evaluate the overall course was very important. Ninety-two (92) percent of Cohort 1 faculty in Year 1 said using feedback for course evaluation was somewhat to very important, and in Year 2 this percentage increased four points to 96 percent.
- Informally studying the effects of their teaching on student learning was considered a high priority by 26 percent of faculty in Cohort 1 and 19 percent of Cohort 2 participants in Year 2.
- In Year 1, 85 percent of Cohort 1 participants said that using comments from students to alter teaching practices or materials was a moderate to high priority. In Year 2, this figure increased to 87 percent. Over two-thirds (69%) of faculty in Cohort 2 said this was a moderate to high priority for them in Year 2.

While data collected from faculty on course profiles at the end of Year 2 was inconsistent among the four campuses, the follow outcomes were revealed upon analysis of data that were available and appeared to be prevalent throughout the campuses.

- Preliminary project results across several projects showed that using a collaborative learning teaching method positively affected students' knowledge at the end of the semester, as compared with a traditional lecture method.
- One instructor found that assessing students' understanding every day was viewed by students as positive according to data collected from a student survey.
- Personal response systems showed a very positive impact across research projects on three campuses. Students perceived these systems to be beneficial to their own learning and to the instructors' teaching. Several faculty commented that the use of these systems greatly increased student interest in course material, involvement in class discussions, and attendance. All of the aforementioned were believed to be reflected in higher final grades than in previous semesters.
- Initial responses from one faculty member revealed that students felt strongly that online homework helped them learn and review at their own pace, and the immediate feedback helped with retention of material.
- Results from a student survey conducted at the beginning of one course were used to revise course material to focus on skills on which the students had rated themselves the lowest.
- Survey data suggested that the gap between the instructor's and the students' perspectives continue to shrink for one course. Students also reported increased understanding and appreciation of the content, especially the relation between the readings and critical papers.
- One faculty member found that almost all (96%) of his students said that the historical aspect of the course helped them understand and enjoy the course material more.
- One instructor found that, on average, each student in the collaborative group gave 2.5 more correct answers on the instructor-made final exam and 2.2 more correct answers on post TUCE as compared to students in the control group.
- For several projects, learning style profiles revealed strong visual learning preferences and tendencies toward sequential, sensory approaches to learning.

- One faculty member found that students who took practice exams scored four points higher on the actual exam than students who had not taken the practice exams.
- In one projects, student surveys showed overwhelming support for the use of worksheets, as students stayed after class to continue working on them.
- One project showed real engagement and interest being instilled in the students as a whole and a critical development of their aesthetic understanding.
- One instructor showed that there was a statistically significant difference between the integrated and the single-session approach on all survey items. The integrated approach also had higher means on all items.
- Common problems with the “pick and choose” approach to writing modules included organization, argumentation, and writing with authority. Some students went to the writing center for individual consultations and found it very helpful. Other students believed they did not have any problems with their writing until they were instructed that their writing was unacceptable.
- One faculty member’s analysis appeared to show that most students overestimated the grade they believed they would receive on any given assignment by, on average, a full letter grade. Student surveys found that three-fourths of students said that they paid a great deal of attention to their peer reviewers’ comments, as well as instructor comments on their papers, and 60 percent believed they revised their papers more thoroughly due to these comments/suggestions.
- One instructor’s results showed little evidence of impact from the introduction of concept mapping on learning outcomes. There was some evidence of improvement in study skills, but nothing significant.

Site visit interviews and focus groups revealed some progress in terms of courses being redesigned based on results of assessment and evaluation efforts. Many faculty had not yet processed the data for the current year’s projects, however, so these refinements had not yet been applied on a universal scale. Among those projects for which assessment and evaluation data were available, key findings include the following:

- All faculty participating in focus groups appreciated feedback (formal or informal) from students in terms of their sentiments towards interventions that were being employed in courses, and were already using or planned to use this feedback to further refine their courses.
- In some cases, almost immediate refinement of courses, material, volume of assignments, or student understanding of concepts was

made possible by data gathered through Personal Response Systems.

- Several courses on various campuses have undergone complete transformation/redesign based on the success of interventions.
- Some faculty that were originally skeptical of experimental practices have been swayed by assessment data to the point that they now advocate the use of certain methods.
- On the Crookston campus, assessment and evaluation practices (stemming in part from the Bush grant) were used to assist in a highly successful reaccreditation effort.

3.4 Faculty Professional Development Opportunities

Faculty professional development was a primary component of the grant funding. Data collected from on-site faculty focus groups, interviews with campus coordinators and consultants, and updates provided during monthly conference calls were analyzed to answer the following research questions:

- How did faculty professional development meet the needs of grant participants?
- How did faculty professional development help faculty use scholarly and collaborative approaches to address student learning issues?
- How did faculty professional development help participants use and understand classroom assessment techniques and course evaluation findings to shape teaching?

How did faculty professional development meet the needs of grant participants?

Site visits and interviews with representatives from each campus revealed the following with regard to how faculty/professional development opportunities met the needs of grant participants:

- Campus coordinators and faculty systemwide reported numerous opportunities for development associated with the grant that extended to and benefited a large number of faculty beyond those conducting grant-funded research.
- Most faculty expressed appreciation for the content of programs, while most or all faculty also greatly valued the opportunities to meet with and share ideas with other faculty that they did not typically associate with.
- Faculty also appreciated development acquired through regular meetings with consultants.

- Faculty from all campuses were also afforded opportunities to attend conferences and present research findings.
- Several faculty expressed that there were so many opportunities that they could not take advantage of them all.
- Many faculty claimed that these development opportunities had been their first significant exposure to concepts of classroom research and assessment and evaluation of teaching methods.
- Faculty participants particularly valued expert speakers and “hands-on” exercises and workshops.
- Faculty at smaller campuses (Crookston, Morris) appreciated opportunities for development on their own campus, where local programs are not typically available.
- Faculty often found opportunities to meet with other colleagues valuable, despite seemingly divergent research topics.
- In some instances, faculty expressed a desire for earlier notice of opportunities, as scheduling conflicts sometimes impeded participation.

How did faculty/professional development help faculty use scholarly and collaborative approaches to address student learning issues?

Development opportunities assisted in the use and integration of scholarly and collaborative approaches to teaching in the following ways:

- Scholarly materials (articles, books) were frequently distributed and discussed at group and/or team meetings and workshops on the Crookston, Duluth, and Morris campuses.
- Consultants drove scholarship and integration of research into projects on the Twin Cities campus through course team meetings.
- Faculty shared articles and other scholarship with one another of joint interest through relationships established at group and team meetings.
- Additionally, campus coordinators and consultants assisted participants in their efforts to publish and present findings from their research.
- Many group meetings allowed for small group discussions and stimulated individual conversations to promote collaboration.
- Several faculty indicated that these development opportunities were their best (or only) opportunity to talk and interact with colleagues, particularly those from other disciplines.

- Regular, consistent meetings with the same faculty, as occurred in group meetings, provided a forum in which trust could be developed to allow ideas and opinions to flow more freely.
- Breeze sessions initiated some conversations between faculty at various campuses that helped to refine methodologies and efforts.

How did faculty/professional development help participants use and understand classroom assessment techniques and course evaluation findings to shape teaching?

In discussions with representatives from each campus, the following information was revealed with regard to development opportunities intended to strengthen assessment and evaluation:

- Assessment and evaluation development opportunities have been made available on each campus through relationships with consultants or through formal programs and workshops.
- Consultants as well as some faculty participants brought expertise in assessment and evaluation to faculty participating in the grant on each of the campuses.
- A limited number of faculty seemed to disregard the value of assessment and evaluation beyond informal or minimal qualitative feedback received from students.
- Various experts on assessment and evaluation have either been brought in over the past year to conduct workshops or are scheduled to conduct workshops in the near future at each of the campuses.

3.5 Program Leadership

As with any grant, leadership is key to participant success. Data collected from faculty participants and campus coordinators were analyzed to determine the effectiveness of program leadership at both the campus level and the system level. The analysis addressed the following research questions:

- What tasks did leaders need to complete?
- What challenging issues did leaders need to address?
- What were the important successes?
- What processes emerged that were critical in managing the program?

What tasks did leaders need to complete?

The typical roles and responsibilities of campus coordinators include:

- overseeing grant budget and allocation of funds to best facilitate the achievement of grant goals on the campus, and in some instances, seeking and acquiring additional funds to supplement efforts or support related efforts falling outside of grant capacity or purview;
- recruiting faculty to participate (submit proposals) and overseeing successive refinement and award of grants;
- recruiting consultants with appropriate knowledge and expertise to serve as mentors and support for project participants;
- participating in monthly video conferences with other campuses, Principal Investigators, and external evaluators;
- communicating and resolving any administrative issues with Principal Investigators;
- participating in monthly updates with external evaluators;
- assisting in scheduling focus groups with faculty, staff, and students associated with the grant for the visit by the external evaluator;
- helping to coordinate development events on campus;
- helping to create awareness of grant proceedings on campus among non-participating faculty and campus administrators;
- working with instructional and technology support staff on campus to ensure adequate support for projects; and
- compiling an annual report of grant proceedings on campus in relation to goals, to be submitted to external evaluator.

What challenging issues did leaders need to address?

Challenges encountered by leaders on each of the campuses included:

- recruiting faculty to commit and participate in the grant;
- ensuring that faculty stayed on-task and on schedule with their work, and keeping up with reporting deadlines (faculty reflections, course profiles);
- addressing problems or lapses in communication arising within groups or teams;
- working with participants and technology and instructional support staff to resolve issues encountered by faculty participants;
- maintaining appropriate levels of student assistance relative to project need over the full year of the project; and

- securing additional funds to support faculty needs related to projects but not covered by grant awards.

What were the important successes?

Important successes noted by campus coordinators included:

- generation of scholarship (articles and presentations) that have been positively received by audiences;
- active, enthusiastic participation by a wide array of faculty;
- faculty morale seeming to improve as research comes to fruition (particularly in Year 2);
- development of faculty into reflective practitioners who seek to continually refine teaching methods to best promote learning;
- use of new, effective technologies to better engage students;
- perception of enhanced student engagement (faculty perceive that students are more receptive);
- dissemination of methods among colleagues and throughout entire disciplines in some cases; and
- appreciation of grant ideals of scholarship, collaboration, assessment, and evaluation.

What processes emerged that were critical in managing the program?

The following processes were identified by campus coordinators as important to maintaining and improving upon the program:

- At the Morris campus, student assistants will be employed as “Morris Academic Partners” in an effort to support ongoing, adequate support for project needs. The Morris campus is also formalizing functions of instructional support, formerly handled by the IT Core Group, into a newly fashioned Instructional Core Group, which is intended to evolve into a permanent support entity after grant funding has concluded.
- On the Crookston campus, meeting frequency will be increased to two per month in an effort to build momentum and continually stimulate interest.
- On the Duluth campus, the division into large and small groups, based on interest, appears to be an effective model that serves to maintain cohesion between all grant participants while allowing for specialization in terms of collaborative efforts.

- The Twin Cities has designed a model of collaboration that is likened to “concentric circles,” beginning with the campus coordinators and principal investigators, flowing outward towards consultants, and then to the faculty and student assistants. This appears to be working effectively, though some desire has been expressed for more interaction among the broader pool of participants.

CHAPTER 4.0:

***Year 2 Accomplishments and
Challenges***

4.0 YEAR 2 ACCOMPLISHMENTS AND CHALLENGES

4.1 Accomplishments

Although the University of Minnesota has benefited from grant funding received from the Bush Foundation since 2001, it has realized a number of significant accomplishments during the second year of the continuation grant. These accomplishments are directly related to the lessons learned from the 2001-2004 funding, and in Years 1 and 2 of the continuation grant. To better illustrate their relationship to the grant outcomes, these accomplishments have been divided into two sections—Student and Faculty Learning and Grant Processes and Procedures.

Student and Faculty Learning

- **Changing the Views of Faculty.** One of the more significant developments that continued into Year 2 was the grant's impact on faculty opinions about research. As learned during focus groups with faculty, more grant participants found themselves experimenting with technology (about three-fourths according to course profiles) and reported that they were comfortable implementing research in their courses through the support and resources made available through the Bush grant. As reported in Chapter 3.0, analysis of evaluation data from the annual surveys and course profiles completed by grant participants also supported this change in the faculty.
- **Enhancing Student Learning.** Course profile and focus group data collected from faculty continue to reveal that faculty participating in the Bush grant are focusing their projects on enhancing student learning by implementing innovative teaching techniques and strategies. (See Exhibit 3-1 for specific research questions addressed by faculty through their grant projects.) Moreover, faculty are implementing their research using a more interdisciplinary approach, thus impacting students across multiple courses that may not have faculty directly participating in the Bush grant project. Most faculty or faculty teams have embraced evaluation and outcomes for measuring the success of innovative teaching strategies and their impact on student learning. Outcome and evaluation data collected by participants thus far are summarized in Section 3.3 and presented in detail in Appendix D of this report.
- **Active Generation of Scholarship.** Many faculty working on projects over the first two years are now publishing and presenting findings from their classroom research experiments. Each campus has seen multiple faculty carry through with their project efforts by publishing findings in journals or presenting findings at regional or national disciplinary conferences. A list of all presentations and publications resulting from Bush grant efforts is being maintained by the University of Minnesota's Center for Teaching and Learning on

the Twin Cities campus, and is available through the program website. This list is also included in Appendix E of this report.

- **Stronger Collaboration Among Faculty Participants.** Collaboration among faculty and between faculty, consultants, and student assistants has increased during this second year of the grant. At the campus level, course teams and small groups appear to be developing camaraderie and synergy, allowing ideas to flow freely towards finding solutions to problems and continually enhancing overall efforts. In terms of inter-campus collaboration, for the second year, the campus coordinator from the Morris campus worked closely with grant leadership to organize an interactive, web-based video conference so that grant participants across all four campuses could network together. A grant participant from each campus presented data on his/her research efforts and outcomes. In faculty interviews and focus groups, grant participants indicated that the session had been very interesting and enlightening. Though some technical issues are still being resolved, participants enjoyed hearing about the work on other campuses and reported that they felt better about the status of their own research. The upcoming Academy of Distinguished Teachers (ADT) conference (for which grant administrators have secured slots for presentations by Bush grant participants from each of the campuses), as well as a proposed end-of-grant conference explicitly for highlighting Bush grant achievements.

Grant Processes and Procedures

- **Effective Operational Procedures.** The Principal Investigators (PIs) for the 2004-2007 Bush grant established formal operating procedures that have facilitated the implementation of the grant and in the future can be used to enhance networking among grant participants as well as assist with the sharing of resources across campuses. Campus coordinators participate in a monthly video conference call, which is followed up with individual conference calls with the external evaluator. Monthly status reports summarizing campus activities are submitted by the external evaluator to all grant leaders. These processes have not only kept everyone informed, but have also helped to alleviate grant-related obstacles as they arise. This approach has funneled down to the campus level as well, as evidenced by the fact that all campuses are holding monthly or even more frequent meetings for grant participants.
- **Improved Working Relationships and Inter-Campus Collaboration Among Grant Leaders.** The four University of Minnesota campuses have much in common and share many of the same concerns. The new Bush grant has allowed them to continue to improve communications and develop closer working relationships. The monthly video conference calls have enabled

campus coordinators to highlight activities more regularly and discuss concerns.

- **Promoting a Scholarly and Collaborative Approach to Teaching.** In its first annual report, MGT cited the need for standardization of definitions for scholarship and more centralized efforts to make applicable research available to all grant participants. At the campus level, grant administrators have made significant strides towards meeting this goal, as publications appear to be freely circulating among each community. While some faculty may still be resistant to or inactive in conducting individual research, scholarship in certain areas is almost inevitably filtering into all efforts through the designed contact with consultants and other faculty. Additionally, the support structures and roles of consultants on the various campuses appear to be contributing to bringing research findings to publication. To promote a collaborative approach, each campus has engineered effective structures for ensuring collaboration among participants through large group meetings and development opportunities, small group meetings, course team meetings, and other interaction with consultants.
- **Coordination with Other Campus Initiatives.** Evaluation data reveal that the four campuses have directly related their research for the Bush continuation grant to the strategic campus initiatives under way on their campuses. Participants seem to be cognizant of the broader effects and importance of their research to each of their campuses, and grant administrators have been taking an active role in promoting and mainstreaming the lessons learned from grant-related efforts. In some instances, faculty continue to be less aware of overall campus initiatives, so grant administrators should continue working with campus administrators and grant participants to further the cohesion of efforts on their campuses.

4.2 Challenges

Throughout Year 2 of the Bush grant, MGT and grant PIs identified challenges that the university would face in the coming year. The intent was to identify areas that the grant PIs and campus coordinators should address in order to off set any challenges to the extent possible. These challenges are outlined below so as to reinforce efforts to reduce their impact in Year 3. They are listed in no particular order but have been divided into two sections—Student and Faculty Learning and Grant Processes and Procedures.

Student and Faculty Learning

- **Data Collection and Evaluation/Compelling Evidence.** Though Year 2 of the grant has seen marked improvement in terms of the number of project teams that have generated preliminary results (including formal publications and/or presentations of findings), grant administrators must continue to push participants to follow through in their efforts to generate findings that can be published and otherwise

disseminated (see Exhibit 3-1 for a summary of project outcomes). One of the most significant concerns of the Archibald Bush Foundation is the evaluation of student achievement and the impact the research is having on student learning, so research findings regarding innovative teaching strategies and methods from as many projects as possible need to be carried through to publication. Resource allocation should reflect a concerted effort to generate tangible results as an assurance that the funds invested by the Foundation are achieving a significant and far-reaching impact.

- **Intra- and Inter-Campus Collaboration.** As stated previously in regard to grant successes, participants and consultants have had positive, fruitful experiences working together at the local level, and some efforts have been made to extend this collaboration beyond the more provincial groupings. Faculty participating in focus groups indicated, however, that they still desire more opportunities to meet with faculty outside of their teams, small groups, or campuses. While monthly and/or bi-monthly meetings on each campus are helping to create synergy and open communication among faculty participants, the upcoming ADT conference and proposed conference for the conclusion of the grant will both serve to promote more inter-campus collaboration. Though scheduling difficulties frequently inhibit intra-campus collaboration, grant leadership should also explore other potential mediums of bringing participants together for campus and systemwide events to share ideas and experiences. Grant leaders have proven to be very creative in this area during Years 1 and 2.

Grant Processes and Procedures

- **Resource Sharing.** As the campuses implemented the Bush grant in Years 1 and 2, they acquired many resources and in-depth knowledge of research available to support grant initiatives. The campuses also organized many professional development and training opportunities for staff that included bringing in experts for workshops and presentations. Due to the nature of the grant activities across the four campuses, many of these resources and training opportunities would have been beneficial for all grant participants. While the logistics of travel across campuses may prove to be difficult for faculty due to time constraints and funding, the grant leaders should find ways to share these resources in Year 3 of the grant.

The Center of Teaching and Learning at the Twin Cities campus has initiated contact with the Chancellor and Vice President for Academic Affairs at Crookston to begin planning for resource sharing. Similar meetings are planned in Year 3 to develop a plan with and for all campuses.

- **Continuance of Development Structures.** An item of concern that has been brought up by representatives from the Crookston and Morris campuses is the continuance of some type of faculty development infrastructure that would persist beyond the termination of the grant. The Bush grant currently serves as the sole formal entity driving faculty development on each of these campuses. Citing considerable need and appreciation for what the Bush grant has allowed over this period, each of these campuses has expressed the desire either to begin utilizing resources from the Twin Cities campus or to establish independent or semi-independent development offices at each site.

- **Consistency in Reporting Standards.** Inconsistency in reporting standards has hindered MGT's ability to evaluate some aspects of grant proceedings on a uniform basis across the campuses. Inconsistent reporting forms/standards were used between campuses in some instances, detracting from MGT's ability as third-party evaluator to compare and contrast proceedings on each campus. Grant administrators on each campus are asked to attempt to more closely adhere to MGT's suggested guidelines in the final year of the grant.

CHAPTER 5.0:

Recommendations

5.0 RECOMMENDATIONS

This chapter presents recommendations that the evaluation team believes will improve the University of Minnesota's ability to continue to implement the Bush Foundation Grant effectively. Most of these recommendations are designed to address the challenges identified in Chapter 4.0. It should be noted that these recommendations are in no particular order, but are divided into two categories—Student and Faculty Learning and Grant Processes and Procedures.

5.1 Recommendations: Student and Faculty Learning

1. Emphasize the need for collecting and communicating evaluation data from local evaluation activities.

The formal plan developed for the systemwide evaluation included collecting data from grant participants on the outcomes of their research. One of the more significant goals of the evaluation is to collect and analyze data on student outcomes, the impact of the research on student learning, and, in particular, how innovative teaching strategies and methods implemented are affecting courses and students. During the analysis of the course profiles and site visit data, MGT learned that many faculty members are not reporting the data they are collecting on their various interventions through channels developed for the external evaluation, though they are discussing these outcomes in group/team meetings.

As indicated earlier in this report, this has occurred for several reasons. The first is that faculty have collected so much data that they do not have sufficient time or resources to complete the analysis. In other instances, the faculty are using the data for their own research but not reporting the information through the various data collection opportunities available, again, due to the extra burden this represents and a perceived lack of resources to meet this need.

As cited in the Year 1 report, in the article "*Mainstreaming Evaluation or Building Evaluation Capacity? Three Key Elements*," Dr. Paul Duignan states that the three key aspects of mainstreaming evaluation are: (1) using an appropriate evaluation model; (2) developing evaluation skills appropriate for each participating level/organization; and (3) each level/organization strategizing to identify priority evaluation questions, rather than just relying on evaluation planning at the individual levels.

The evaluation of the Bush grant already has these three components in place. It will be important over the next year that the grant PIs, campus coordinators, and external evaluators establish a format for discussing and reporting success in researching student learning in the classes not only in the final report, but also in the monthly video meetings. Scholarship in the area of mainstreaming evaluation can be used to help frame this discussion and to help grant leaders decide how to best report findings in the end-of-year report.

Finally, campus coordinators should focus their administration on bringing research efforts to fruition. On several campuses, this process is already under way, as resources have been dedicated to funding additional assistance in data processing and analysis or promoting efforts to attend and present at regional and national academic conferences. Budgets should be amended and re-allocated, as appropriate, and, participants should then be made aware of available resource, so as to foster efforts to publish and present findings and outcomes. It is important to note that while publication and presentation of findings is not the necessary end, faculty are producing valuable outcomes.

2. Continue to promote a scholarly and collaborative approach to teaching and learning.

The second goal of the grant continuation proposal states that the university will foster a scholarly and collaborative approach to addressing student learning. As cited in previous chapters, participants and consultants have had more experiences working together at the local level in Year 2 of the grant, and these experiences have yielded fruit in terms of the volume of applicable existing research that has fed into various efforts. While some attempts have been made to extend this collaboration beyond the more provincial groupings, faculty participating in focus groups indicated they still desire more opportunities to meet with faculty outside their teams, small groups, or campuses. As well, the similarity in some projects across campuses is duly noted, though having different “outcomes” can certainly be recognized as a reason for differentiating these projects.

3. Devise a plan to create more networking opportunities for grant participants and formalized information-sharing channels to promote internal and cross-campus collaboration and dissemination of information.

On each campus, faculty continued to report in Year 2 that through their monthly meetings, they have been able to learn from one another and maximize grant funding by sharing data collection techniques and other resources. Furthermore, evaluation data revealed that faculty on the smaller campuses are having more success than their counterparts on longer campuses in disseminating information on their research to non-participating faculty and administrators on their respective campuses.

During interviews and focus groups with faculty, MGT consultants recognized that many of the research projects being implemented on the four campuses are similar in nature even if they are addressing different outcomes. With the exception of the two Breeze sessions held in Year 2, cross-campus collaboration seems to end at the boundaries of each campus.

The grant PIs and campus coordinators should explore the possibility of networking grant participants, as well as non-participants, together more frequently as the grant moves into Year 3 to maximize the potential impact of respective grant activities across the system.

It should also be noted that while the Breeze technology has proven somewhat successful, there have been several instances where technical difficulties have prohibited participants and broader faculty communities from realizing the maximum benefit from the presentations. Grant leaders should either correct errors that have been encountered with the current technology or explore other technologies/mediums that might serve as better platforms for sharing experiences across campuses. If a viable solution can be implemented and used with success, it could contribute towards extending collaborative efforts between the campuses beyond the conclusion of the grant.

While the upcoming Academy of Distinguished Teachers conference and proposed conference at the conclusion of the grant will both serve to meet this need, grant leaders should also explore other potential means of bringing participants together for interdisciplinary, inter-campus, and systemwide events, in forums that facilitate the sharing of knowledge and experiences among faculty exploring compatible research topics.

5.2 Recommendations: Grant Processes and Procedures

4. Develop a more collaborative approach to enable campuses to share grant-related resources and staff development opportunities.

During the monthly video conference calls and site visits, consultants continue to learn about many resources that are available, or are being developed, to support faculty as they implement their research projects. Some campuses have an abundance of resources in this respect, while others are more limited.

Campuses are organizing workshops for faculty that include presentations from field experts. While all of these opportunities are beneficial for the grant implementations on each of the four campuses, in many instances these resources could benefit faculty across the system. For example, some campuses have existing staff who can share specific knowledge and expertise on a systemwide basis, such as the evaluation consultant(s) on the Twin Cities and Morris campuses. Sharing resources of this nature between campuses could reduce the need to outsource for such efforts in the future.

The grant PIs and campus coordinators should collaborate each semester, at a minimum, on training and staff development offerings to see where mutual/shared workshops could be beneficial. Grant leaders have proven to be creative when addressing challenges such as limited travel funds or time constraints.

As stated earlier in this report, the Center of Teaching and Learning at the Twin Cities campus has initiated contact with the Chancellor and Vice President for Academic Affairs at Crookston to begin planning for resource sharing. Similar meetings are planned in Year 3 to develop plan with for and with all campuses.

5. Explore funding opportunities beyond the Bush Foundation to allow for grant activities and research to continue beyond 2007.

Smaller campuses within the University of Minnesota system do not have the same resources available as larger campuses to support faculty development and research. Leaders from these campuses would like to see the synergy developed by the Bush funding continue beyond 2007. However, due to a restructuring of focus within the Foundation, it is not certain that funding for faculty development grants will continue beyond the conclusion of the current grant. Citing appreciation and definite need for the opportunities the Bush grant has provided since 2001, leaders would like to see the funding continue, from whatever sources might be available.

Grant leaders should continue discussions with the Bush Foundation to explore opportunities for additional funding, but should also begin looking for alternate opportunities to minimize any lapse in funding that may occur. The university system could also examine ways to utilize resources available on the larger campuses for faculty development and research by establishing independent or semi-independent development offices on each University of Minnesota campus.

6. Ensure evaluation protocols and documents are used across all campuses for consistency in the reporting of data.

As cited earlier in this report, there has been inconsistency in data reporting during Year 2. Grant PIs, campus coordinators, and external evaluators should discuss during upcoming meetings the best ways to ensure that consistent data collection processes are used as much as possible, specifically when reporting outcomes for the various research conducted and strategies implemented. Furthermore, these monthly reportings will help to keep grant leaders updated, and how data collection techniques will impact the ability to analyze success in meeting grant goals.

APPENDICES

APPENDIX A:

External Evaluator Qualifications

APPENDIX A EXTERNAL EVALUATOR QUALIFICATIONS

The University of Minnesota contracted with MGT of America, Inc., to conduct the external evaluation for this continuation project. MGT was established over 30 years ago in Tallahassee, Florida, for the purpose of providing high-quality management and research consulting services to public sector entities. In addition to our corporate office in Tallahassee, MGT has established regional offices in Olympia, Washington; Sacramento, California; and Austin, Texas.

The firm's full-time staff of over 130 professionals brings a wealth of knowledge and depth of understanding to all their client engagements, delivering the quality services clients expect and deserve. The organizational mission is supported by their capacity to deliver an extensive range of services to a variety of public sector institutions, nonprofit groups, private businesses, and other organizations.

MGT is recognized as one of the nation's premier higher education planning and management research consulting firms. As a result of our extensive experience in higher education, we have a keen understanding of university, college, and state system operations that far exceeds that of the competition. More than half of MGT's 2,900 client engagements have involved educational institutions or state education agencies.

A great advantage MGT offers to clients is our understanding of educational structures and operations, and how best business practices can be applied to those structures and operations. Our staff includes individuals who have served in various roles throughout the education community; many were educators before they became consultants. Thus, we have credibility with the educational community.

The MGT staff fully understands the process of grant evaluation. Our relevant past experience make us exceptionally qualified to serve as the external evaluator for the Bush Foundation Grant.

APPENDIX B:

Data Collection Instruments

**APPENDIX B
DATA COLLECTION INSTRUMENTS**

B.1 Faculty Survey Instrument

**UNIVERSITY OF MINNESOTA
ENHANCING STUDENT LEARNING THROUGH INNOVATIVE
TEACHING AND TECHNOLOGY STRATEGIES
A BUSH FOUNDATION GRANT
Annual Evaluation Survey
Year 2**

Dear Bush Foundation Grant participant:

You have entered the electronic version of the "Enhancing Student Learning through Innovative Teaching and Technology Strategies" survey. Use your mouse to click on the responses you choose for each question.

For text response items, position your mouse in the box for the response and type your answer. You will not need to hit "enter" or "tab" after you input responses. At the end of the survey, please remember to click on the "submit" button so your information will be sent to MGT of America, Inc. MGT will aggregate the data by campus and share the data with the grant PIs and Campus Coordinators.

Please answer all items to the best of your ability. The information you provide is extremely useful and will generate valuable feedback for your campus and the grant evaluation.

If you experience any problems with this electronic survey, please contact Sean Friend with MGT at sfriend@mgtamer.com or 850-386-3191.

We thank you in advance for your cooperation.

Carol Carrier, Vice President of Human Resources
Linda Jorn, Director, Digital Media Center, Office of Information Technology
David Langley, Director, Center for Teaching and Learning Services, Human Resources

SECTION A: BACKGROUND INFORMATION

Name: _____
(MGT assures you that all survey data received will remain anonymous)

Campus: _____
(this will be a drop down box with each campus listed)

When did you first join the Bush grant on your campus?

- ₍₁₎ Spring 2005
- ₍₂₎ Summer 2005
- ₍₃₎ Fall 2005
- ₍₄₎ Spring 2006
- ₍₅₎ Summer 2006
- ₍₆₎ Fall 2006
- ₍₇₎ Spring 2007
- ₍₈₎ Summer 2007
- ₍₉₎ Fall 2007

1. Gender:

- ₍₁₎ Female ₍₅₎ Male

2. Appointment Type:

- ₍₁₎ Tenured Faculty
- ₍₃₎ Tenure-track Faculty
- ₍₅₎ Full-time non-regular faculty or professional academic staff
- ₍₇₎ Part-time non-regular faculty or professional staff

3. Percent of time devoted to teaching in current position:

- ₍₁₎ 25% or less
- ₍₃₎ Between 26% and 50%
- ₍₅₎ Between 51% and 75%
- ₍₇₎ More than 76%

4. Number of years you have been teaching post-secondary students

_____ Years

5. How much time do you expect to invest in the Bush grant program?

- ₍₁₎ 0 to 2 hours per month
- ₍₃₎ 3 to 5 hours per month
- ₍₅₎ 6 to 10 hours per month
- ₍₇₎ 11 to 15 hours per month
- ₍₉₎ More than 15 hours per month

6. Please describe your role as a Bush Foundation Grant Participant?

SECTION B: PROJECT ACTIVITIES AND OUTCOMES

7. In the past year, how important have the following been for improving student learning?

	No Importance	Little Importance	Somewhat Important	Very Important
a. Collecting information to assess students' entry-level knowledge or abilities	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
b. Collecting information to diagnose learning problems or identify individuals who need extra help	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
c. Using classroom assessment strategies to prompt student thinking during lecture or class discussion	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
d. Helping students learn to assess their own progress	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
e. Motivating students to improve their study skills	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
f. Getting a better sense of what the class as a group is learning	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
g. Using assessment strategies to help make mid-course corrections in teaching strategies or materials	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
h. Using feedback to improve mid-term or final exams	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
i. Using student feedback to evaluate the overall course	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)

8. How often have you used the following forms of assessment over the past year?

	Never	Sometimes	Often	Very Often
a. Interactive techniques (e.g., voting, debates, small group problem-solving)	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
b. Qualitative methods (e.g., journals, reflection papers, essays, short answer)	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
c. Quantitative methods (e.g., quizzes or tests, surveys)	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
d. Anonymous student response techniques	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
e. Identified student response techniques	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
f. Un-graded performance measures	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
g. Graded performance measures	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
h. Voluntary measures of performance	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
i. Required measures of performance	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
j. Individual student performance	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
k. Group performance	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
l. Other _____	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)

9. Over the past year, to what degree has each of the following factors motivated you to change your course?

	None	Low	Moderate	High
a. Desire to address varied learning styles and needs	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
b. Desire to encourage students to spend more time on learning tasks	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
c. Desire to facilitate communication between students and instructors	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
d. Desire to help students work more collaboratively	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
e. Desire to build on students' familiarity with technology	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
f. Desire to increase students' access to course materials	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
g. Desire to use technology simulations to teach topics that may have been too dangerous or expensive previously	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
h. Desire to teach my course more efficiently	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
i. Desire to expect higher quality work from my students	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)

10. Which items below describe the work you intend to do or have done as part of the Bush grant?

	Yes	No
a. New course syllabus, readings or materials	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
b. New website	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
c. New presentation tools	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
d. New communication tools	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
e. New student assignments	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
f. New instructional strategies	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
g. New technology-enhanced learning strategies	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
h. New reflection strategies	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
i. New collaborative strategies	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
j. New ways to address student learning styles	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
k. New classroom assessment methods or instruments	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
l. New grading techniques	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
m. New software or tailored application	<input type="checkbox"/> (1)	<input type="checkbox"/> (5)
n. Other _____		

SECTION C: SCHOLARSHIP AND COLLABORATION

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.

	None	Low	Moderate	High
11. Using active learning techniques such as small group discussions and team projects.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
12. Using information in your course(s) from recent articles, books, or topics.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
13. Using technology in your teaching.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
14. Overseeing student independent research or creative work.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
15. Informally studying the effects of your teaching on student learning.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
16. Taking into account differences among students in how they learn.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
17. Using interdisciplinary knowledge to inform your course design.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
18. Implementing team teaching or other collaborative approaches in courses.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
19. Updating your knowledge of your discipline.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
20. Including multicultural perspectives in appropriate courses.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
21. Using comments from students to alter teaching practices or materials.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
22. Helping students make connections between their prior learning and new knowledge.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
23. Using a variety of techniques in assessing student learning in your courses.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
24. Relating concepts in your courses to real life, such as through problem-based or service learning.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
25. Making connections to other disciplines for students.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
26. Meeting informally with students outside of class, labs, or studios.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
27. Providing written comments to students on their assignments and exams.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
28. Providing prompt feedback to students about their exam results and assignments.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
29. Using examples or illustrations to clarify course material.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
30. Setting high expectations for all students.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
31. Providing syllabi with course objectives, assignments, and grading procedures.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
32. Discussing with colleagues your course content, materials, assessment techniques, and the like.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
33. Participating in conferences, seminars, or workshops on teaching or student learning.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
34. Presenting on your discipline in a colleague's class.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
35. Inviting colleagues to review your syllabi or teaching materials.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
36. Making your course syllabi available to anyone on the Internet or other public sources.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
37. Preparing a portfolio or dossier to support your teaching performance.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
38. Working with an undergraduate to further inform your course design.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)

39. Working with a Teaching Assistant to further inform your course design.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
40. Working with other faculty to further inform your course design	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)
41. Working with consultants to further inform your course design.	<input type="checkbox"/> (1)	<input type="checkbox"/> (3)	<input type="checkbox"/> (5)	<input type="checkbox"/> (7)

42. At the end of the grant, what criteria will you use to determine whether your participation in the grant was worthwhile?

Thank you very much for your cooperation!

MGT of America, Inc. expresses appreciation to JA Centa/Syracuse University for their permission to modify their Inventory on the Scholarship of Teaching and Learning.

B.2 Course Profile Instrument

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus:

Faculty Member(s)/Instructor:

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.):

Course Impacted by Research (e.g., Theatre History TH 3171):

Course Description: *(Please provide the course overview that appears in course bulletins)*

Student Learning/Teaching Issue/Research Question:

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

Evaluation Plan:

Summary of Outcomes:

Example: Student survey data revealed . . .

Reflection Log/Status: (To be updated at a minimum bi-monthly)

Describe the activities/work you have completed since the last time you reported.

What successes have you experienced with your work/project?

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

How are you using collaboration within your project?

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

B.3 Grant PI Interview Guide

**BUSH FOUNDATION GRANT
SYSTEM WIDE GRANT ADMINISTRATOR INTERVIEW GUIDE
FALL 2006**

Date: _____ Interviewer: _____

1. To what extent do you believe program participants throughout the system are aligning their projects with strategic campus initiative(s) with regard to student learning?

2a. How has collaboration among faculty influenced teaching systemwide?

2b. How has this changed from before the grant?

3. How do you believe faculty are utilizing a scholarly approach to teaching systemwide?

3b. How has this changed from before the grant?

4a. What are some examples of assessment/evaluation strategies have you learned faculty are using to assess student learning systemwide?

4b. What challenges have faculty faced with regard to implementing assessment strategies?

5a. How are faculty utilizing data from assessment and evaluation to make adjustments to their teaching and/or course design systemwide?

5b. Are you aware of any adjustments that are planned for faculty projects systemwide?

6a. How well are faculty development activities meeting the needs of participants systemwide?

6b. What faculty development activities are still needed to assist faculty systemwide?

7a. What have been the faculty's greatest successes since the implementation of the Bush Grant?

7b. What have been the faculty's greatest challenges?

7c. What have faculty learned while implementing Bush Grant activities?

8. As the grant PIs, what obstacles have you faced and how did you overcome them?

9. What new processes emerged that you believe are critical in managing the Bush Grant?

10. What changes will you make for the administration of the grant as you go into Year 3?

11. Additional Comments.

B.4 Campus Coordinator Interview Guide

**BUSH FOUNDATION GRANT
CAMPUS COORDINATOR INTERVIEW GUIDE
FALL 2006**

Date: _____ Campus: _____

1. How are program participants on your campus aligning their projects with strategic campus initiative(s) with regard to student learning?

2a. How has collaboration influenced teaching on your campus?

3a. How are faculty utilizing scholarly approaches to teaching on your campus?

4. What types of assessment/evaluation strategies are faculty utilizing to gauge student learning?

5a. How have faculty utilized data from assessment and evaluation to make adjustments to their course design and or methodology?

5b. What adjustments are planned?

5c. What challenges have faculty faced with regard to implementing assessment strategies?

6. What challenges you have faced as you work to mainstream local evaluation for the Bush Grant on your campus?

7a. How have faculty development activities on your campus met the needs of grant participants on your campus?

7b. What faculty development activities are still needed to assist faculty on your campus?

8a. What have been the faculty's greatest successes since the implementation of the Bush Grant?

8b. What have been the faculty's greatest challenges?

8c. What have faculty learned while implementing Bush Grant activities?

9. As the campus coordinator, what obstacles have you faced, and how did you overcome them?

10a. What changes will you make for the administration of the grant on your campus as you go into Year 3?

10b. Do you have any recommendations for changes for the grant administration at the system level?

11a. How would you rate the support you received at the system level from the Grant PIs? Why?

11b. Do you have any recommendations for changes for the grant administration at the system level?

12. Additional Comments.

B.5 Faculty Focus Group Guide

**BUSH FOUNDATION GRANT
FACULTY FOCUS GROUP GUIDE
FALL 2006**

Date: _____ Campus: _____ Number of Faculty: _____

1. How is your project aligned with strategic campus initiatives related to student learning?

2. To what extent has collaboration with colleagues influenced your teaching?

3. To what extent are you utilizing research articles and publication to inform your Bush Grant project?

4a. What types of assessment/evaluation strategies are you using to assess student learning in your courses?

4b. How has the grant expanded your use of assessment strategies to determine the impact on student learning?

4c. What challenges have you faced with regard to implementing assessment strategies?

5a. How have you utilized data from assessment and evaluation to make adjustments to your teaching and/or course design?

5b. What adjustments are being planned?

6a. Has the focus of your research project changed since your work with the Bush Grant began? If so, how?

6b. What changes in your course design or methodology have you considered but not yet implemented? Why?

7a. To what extent do you believe faculty development activities have met your needs?

7b. How could faculty development activities be improved?

8a. What have been the greatest successes since the implementation of the Bush Grant?

8b. What have been your greatest challenges?

8c. What lessons would you share with colleagues based on your involvement with the Bush Grant activities and your research?

9. Do you have any recommendations for changes to the grant administration on your campus?

10. Additional Comments.

B.6 Consultant Focus Group Guide

**BUSH FOUNDATION GRANT
CONSULTANT FOCUS GROUP GUIDE
FALL 2006**

Date: _____ Campus: _____ Number of Consultants: _____

1a. How would you define your role as a consultant? (This is a key question. Please probe for their role in helping faculty with teaching strategies, assessment of learning, dissemination of lessons learned, and evaluating their projects.)

1b. What types of activities do you most often perform?

1c. About how many hours a week do you average on the Bush Grant?

2. How are faculty utilizing collaboration in their approach to teaching on your campus?

3a. How are faculty utilizing scholarly approaches to teaching on your campus?

3b. What is your role in helping them to take this scholarly approach?

4a. How have the faculty's definitions and attitudes towards the importance of a scholarly approach to teaching changed since they became involved with the current Bush Grant?

4b. How have the faculty's definitions and attitudes towards the importance of a collaborative approach to teaching changed since they became involved with the current Bush Grant?

5a. What faculty development activities have been provided on your campus to assist faculty with the research projects?

5b. To what extent do you believe these staff development activities met their needs?

5c. What faculty development activities are still needed to assist faculty on your campus?

6. To what extent have staff development activities assisted faculty with using scholarly and collaborative approaches to address student learning issues?

7. How have faculty development activities assisted faculty with using classroom assessment techniques and course evaluation findings to shape their teaching?

8a. What were the faculty's greatest successes this past year?

8b. What have been the faculty's greatest challenges?

8c. What lesson have faculty learned while implementing Bush Grant activities?

9a. Do you have any recommendations for changes to the grant administration as the campus level?

9b. Do you have any recommendations for changes to the grant administration as the system level?

10. Additional Comments.

B.7 Graduate Student Focus Group Guide

**BUSH FOUNDATION GRANT
GRADUATE STUDENT FOCUS GROUP GUIDE
FALL 2006**

Date: _____ Campus: _____ Number of Students: _____

1. How were you chosen to participate with the Bush Foundation Grant research projects?

2a. What activities are you involved in for the research project(s)?

2b. What activities are others on your team responsible for?

3. How would you describe your relationship with the other team members? (Look for things such a being a co-equal, the receive recognition for their work, there is trust, etc.)

4. When there is disagreement or conflict within the group, how is it handled?

5. What are some of the rules that your team has in terms of how decisions are made and how work gets done? (Look for things like they agree to take risks, they have regular meeting times, they know what success means for their group, they are flexible with rules if changes occur, etc.)

6. What types of assessment/evaluation strategies is your project utilizing?

7a. How is data utilized to make adjustments course design and/or methodology?

7b. What adjustments are planned?

8. How are you collaborating with faculty and/or other grant participants, to further inform changes in course design and/or methodology?

9a. How have professional development activities met your needs?

9b. How could professional development activities be improved?

10a. What have been your greatest successes since the implementation of the Bush Grant?

10b. What have been your greatest challenges?

10c. What have you learned that you would like to share with others based on your involvement with the Bush Grant activities and/or your research?

11. Do you have any recommendations for changes to the grant administration on your campus?

11. Additional Comments.

B.8 Coordinator Reflections/Summary Instrument

**University of Minnesota
Bush Foundation Grant
Coordinator Reflections/Summary
Year 2**

Dear Campus Coordinators,

As in the past we are asking that you supply a summary to reflect on the research being conducted through the Bush grant on your campus so that we can provide the Bush Foundation with a more complete picture of the activities and outcomes. The data you supply will be used in conjunction with the data collected from site visits, surveys, and monthly conference calls to determine the extent to which the goals and objectives for the grant are being met. As you respond to these questions below, please take time to reflect upon **meetings** you have had with participants, and review the **course profiles** for more detailed examples.

Please return these completed questionnaires to Cindy Seitel via email by December 28. We realize that many of you will be finished up with course work and be on break at this time, but in the event you needed extra time beyond to review profiles we wanted to extend the deadline. Please feel free to submit this feedback earlier if you would like.

We thank you in advance for your assistance.

Campus: _____

1. How are the research projects on your campus aligned with current campus initiatives?
2. Please summarize the research questions for projects on your campus?
3. In reviewing the course profiles from faculty, do you believe faculty understand how their research aligns with campus initiatives? Why or Why not?

4. Based on data from the course profiles, please summarize how faculty participants and their research on your campus foster a scholarly approach to learning.
5. How have the participants' attitudes and definitions of a scholarly approach to learning changed since the beginning of the grant?
6. Please summarize how faculty on your campus are disseminating their research.
7. In reviewing the course profiles, how are faculty using a collaborative approach to learning? How has this changed since the beginning of the grant?
8. What professional development has been provided to faculty participants on your campus during Year 2?
9. What types of assessments are being used to gather data to inform the research of grant projects?
10. Please summarize the key research findings from projects on your campus (i.e., test data revealed that students who participated in a course where individual response systems were used performed better than those who did not participate in these courses; additionally, attendance was reported to be higher in courses using these systems as well.).
11. Please summarize the successes faculty have experienced while conducting their research?
12. Please summarize the more common challenges faculty have experienced while conducting their research?
13. What are the key lessons you have learned from overseeing the grant for Years 1 and 2?
14. What do you think you will do differently as the grant moves into its final year?
15. How have the grant PIs supported/assisted you with coordinating the grant activities?
16. Please summarize any recommendations you have for how the grant PIs could support you and/or implement the grant more effectively?

APPENDIX C:

Survey Analysis: Systemwide

APPENDIX C YEAR 2 SURVEY ANALYSIS: SYSTEMWIDE

SECTION A: BACKGROUND INFORMATION

Campus: All Campuses by Cohort¹

When did you first join the Bush grant on your campus?

	N	%
Cohort 1 (2006)	49	74%
Cohort 2 (2007)	17	26%

1. Gender:

	Cohort 1		Cohort 2	
	N	%	N	%
Response				
Female	22	46%	5	29%
Male	26	54%	12	71%

2. Appointment Type:

	Cohort 1		Cohort 2	
	N	%	N	%
Response				
Tenured Faculty	25	51%	6	35%
Tenure-track Faculty	11	22%	6	35%
Full-time non-regular faculty or professional academic staff	12	25%	5	29%
Part-time non-regular faculty or professional staff	1	2%	0	0%

3. Percent of time devoted to teaching in current position:

	Cohort 1		Cohort 2	
	N	%	N	%
Response				
25% or less	5	10%	1	6%
Between 26% and 50%	8	16%	2	12%
Between 51% and 75%	11	22%	5	29%
More than 76%	25	51%	9	53%

¹ Sixty-two (62) Cohort 1 faculty began participation in the Bush grant during Year 1 (2005), and 49 continued in Year 2 (2006). Cohort 2 faculty (a total of 17) began participation in the grant in Year 2.

4. Number of years you have been teaching post-secondary students

	Cohort 1	Cohort 2
Minimum	2	1
Maximum	38	38
Mean	17.27	13.88
St. Dev	10.165	9.479
Median	15	12
Mode	20	10

5. Faculty members vary in their ability to devote time to Bush grant programs. How much time do you expect to invest in the program?

Response	Cohort 1		Cohort 2	
	N	%	N	%
0 to 2 hours per month	8	16%	0	0%
3 to 5 hours per month	13	27%	7	41%
6 to 10 hours per month	15	31%	8	47%
11 to 15 hours per month	8	16%	2	12%
more than 15 hours per month	5	10%	0	0%

6. Please describe your role as a Bush Foundation Grant Participant?

Based on the qualitative analysis of open-ended responses, BFG participants surveyed appear to fall into four basic groups: those who are developing the projects, those who are conducting the research, team members and campus coordinators leading faculty, and those faculty teaching the courses. It is important to note that some faculty may fall into more than one of the basic groups.

SECTION B: PROJECT ACTIVITIES AND OUTCOMES

7. In the past year, how important have the following been for improving student learning?

	Year	% of Respondents								
		No Importance		Little Importance		Somewhat Important		Very Important		
		C1	C2	C1	C2	C1	C2	C1	C2	
a. Collecting information to assess students' entry-level knowledge or abilities										
Cohort 1 (n=63): Mean=2.81, Median=3, Mode=3, Std. deviation=1.05	2005	16%	--	18%	--	37%	--	30%	--	
Cohort 1 (n=48): Mean=3.06, Median=3, Mode=3, Std. deviation=.861 Cohort 2 (n=15) Mean=2.53, Median=3, Mode=3, Std. deviation=.990	2006	8%	20%	8%	20%	52%	47%	31%	13%	

7. In the past year, how important have the following been for improving student learning?
(Continued)

	Year	% of Respondents							
		No Importance		Little Importance		Somewhat Important		Very Important	
		C1	C2	C1	C2	C1	C2	C1	C2
b. Collecting information to diagnose learning problems or identify individuals who need extra help									
Cohort 1 (n=62): Mean=2.77, Median=3, Mode=3, Std. deviation=.990	2005	13%	--	24%	--	36%	--	27%	--
Cohort 1 (n=48): Mean=2.44, Median=2.5, Mode=3, Std. deviation=.796 Cohort 2 (n=15): Mean=2.73, Median=2, Mode=2, Std. deviation=1.03	2006	13%	7%	38%	47%	44%	13%	6%	33%
c. Using classroom assessment strategies to prompt student thinking during lecture or class discussion									
Cohort 1 (n=63): Mean=3.24, Median=3, Mode=4, Std. deviation=.946	2005	10%	--	6%	--	35%	--	49%	--
Cohort 1 (n=48): Mean=3.46, Median=4, Mode=4, Std. deviation=.743 Cohort 2 (n=15): Mean=3.47, Median=4, Mode=4, Std. deviation=.915	2006	2%	7%	8%	7%	31%	20%	58%	67%
d. Helping students learn to assess their own progress									
Cohort 1 (n=63): Mean=2.97, Median=3, Mode=4, Std. deviation=.967	2005	6%	--	29%	--	27%	--	38%	--
Cohort 1 (n=47): Mean=2.85, Median=3, Mode=3, Std. deviation=.834 Cohort 2 (n=15): Mean=2.93, Median=3, Mode=3, Std. deviation=.799	2006	6%	0%	23%	33%	49%	40%	21%	27%
e. Motivating students to improve their study skills									
Cohort 1 (n=63): Mean=3.45, Median=4, Mode=4, Std. deviation=.737	2005	3%	--	5%	--	35%	--	57%	--
Cohort 1 (n=48): Mean=3.44, Median=4, Mode=4, Std. deviation=.796 Cohort 2 (n=15): Mean=3.27, Median=4, Mode=4, Std. deviation=.961	2006	2%	7%	13%	13%	25%	27%	60%	53%

7. In the past year, how important have the following been for improving student learning? (Continued)

	Year	% of Respondents							
		No Importance		Little Importance		Somewhat Important		Very Important	
		C1	C2	C1	C2	C1	C2	C1	C2
f. Getting a better sense of what the class as a group is learning									
Cohort 1 (n=63): Mean=3.40, Median=4, Mode=4, Std. deviation=.814	2005	3%	--	11%	--	29%	--	57%	--
Cohort 1 (n=47): Mean=3.38, Median=3, Mode=4, Std. deviation=.677 Cohort 2 (n=15): Mean=3.47, Median=4, Mode=4, Std. deviation=.640	2006	0%	0%	11%	7%	40%	40%	49%	53%
g. Using assessment strategies to help make mid-course corrections in teaching strategies or materials									
Cohort 1 (n=63): Mean=3.13, Median=3, Mode=4, Std. deviation=.959	2005	8%	--	16%	--	32%	--	44%	--
Cohort 1 (n=47): Mean=3.17, Median=3, Mode=4, Std. deviation=.816 Cohort 2 (n=15): Mean=2.87, Median=3, Mode=3, Std. deviation=.915	2006	2%	7%	19%	27%	38%	40%	40%	27%
h. Using feedback to improve mid-term or final exams									
Cohort 1 (n=60): Mean=3.15, Median=3, Mode=3, Std. deviation=.820	2005	3%	--	17%	--	42%	--	38%	--
Cohort 1 (n=48): Mean=2.90, Median=3, Mode=3, Std. deviation=1.016 Cohort 2 (n=15): Mean=3.00, Median=3, Mode=4, Std. deviation=1.069	2006	13%	13%	19%	13%	35%	33%	33%	40%
i. Using student feedback to evaluate the overall course									
Cohort 1 (n=63): Mean=3.29, Median=4, Mode=4, Std. deviation=1.038	2005	5%	--	3%	--	25%	--	67%	--
Cohort 1 (n=48): Mean=3.58, Median=4, Mode=4, Std. deviation=.647 Cohort 2 (n=15): Mean=3.53, Median=4, Mode=4, Std. deviation=.640	2006	2%	0%	2%	7%	31%	33%	65%	60%

8. How often have you used the following forms of assessment over the past year?

	Year	% of Respondents							
		Never		Sometimes		Often		Very Often	
		C1	C2	C1	C2	C1	C2	C1	C2
a. Interactive techniques (e.g., voting, debates, small group problem-solving)									
Cohort 1 (n=63): Mean=2.57, Median=2, Mode=2, Std. deviation=.962	2005	10%	--	48%	--	19%	--	24%	--
Cohort 1 (n=46): Mean=2.74, Median=3, Mode=2, Std. deviation=1.021 Cohort 2 (n=15): Mean=2.80, Median=3, Mode=3, Std. deviation=1.082	2006	11%	20%	35%	7%	24%	47%	30%	27%
b. Qualitative methods (e.g., journals, reflection papers, essays, short answer)									
Cohort 1 (n=63): Mean=2.57, Median=3, Mode=3, Std. deviation=1.043	2005	19%	--	27%	--	32%	--	22%	--
Cohort 1 (n=47): Mean=2.40, Median=2, Mode=2, Std. deviation=.970 Cohort 2 (n=15): Mean=2.33, Median=2, Mode=2, Std. deviation=.900	2006	19%	13%	36%	53%	30%	20%	15%	13%
c. Quantitative methods (e.g., quizzes or tests, surveys)									
Cohort 1 (n=63): Mean=3.40, Median=4, Mode=4, Std. deviation=.853	2005	6%	--	5%	--	32%	--	57%	--
Cohort 1 (n=47): Mean=3.32, Median=3, Mode=4, Std. deviation=.783 Cohort 2 (n=15): Mean=3.47, Median=4, Mode=4, Std. deviation=.743	2006	2%	0%	13%	13%	36%	27%	49%	60%
d. Anonymous student response techniques									
Cohort 1 (n=62): Mean=2.24, Median=2, Mode=2, Std. deviation=.803	2005	15%	--	55%	--	23%	--	8%	--
Cohort 1 (n=47): Mean=2.21, Median=2, Mode=2, Std. deviation=.954 Cohort 2 (n=15): Mean=2.07, Median=2, Mode=2, Std. deviation=.884	2006	21%	27%	51%	47%	13%	20%	15%	7%
e. Identified student response techniques									
Cohort 1 (n=60): Mean=1.95, Median=2, Mode=2, Std. deviation=.852	2005	35%	--	38%	--	23%	--	3%	--
Cohort 1 (n=46): Mean=2.20, Median=2, Mode=2, Std. deviation=.980 Cohort 2 (n=15): Mean=2.00, Median=2, Mode=1, Std. deviation=1.069	2006	26%	40%	41%	33%	20%	13%	13%	13%

8. How often have you used the following forms of assessment over the past year? (Continued)

	Year	% of Respondents							
		Never		Sometimes		Often		Very Often	
		C1	C2	C1	C2	C1	C2	C1	C2
f. Un-graded performance measures									
Cohort 1 (n=62): Mean=2.27, Median=2, Mode=2, Std. deviation=.908	2005	19%	--	45%	--	24%	--	11%	--
Cohort 1 (n=47): Mean=2.30, Median=2, Mode=2, Std. deviation=.976 Cohort 2 (n=15): Mean=2.20, Median=2, Mode=2, Std. deviation=1.014	2006	21%	27%	43%	40%	21%	20%	15%	13%
g. Graded performance measures									
Cohort 1 (n=63): Mean=3.57, Median=4, Mode=4, Std. deviation=.615	2005	--	--	6%	--	30%	--	64%	--
Cohort 1 (n=46): Mean=3.37, Median=3, Mode=4, Std. deviation=.679 Cohort 2 (n=15): Mean=3.00, Median=3, Mode=3, Std. deviation=.926	2006	0%	7%	11%	20%	41%	40%	48%	33%
h. Voluntary measures of performance									
Cohort 1 (n=60): Mean=1.85, Median=2, Mode=1, Std. deviation=.880	2005	43%	--	32%	--	22%	--	3%	--
Cohort 1 (n=46): Mean=1.96, Median=2, Mode=1, Std. deviation=.918 Cohort 2 (n=15): Mean=1.73, Median=2, Mode=1, Std. deviation=.799	2006	37%	47%	37%	33%	20%	20%	7%	0%
i. Required measures of performance									
Cohort 1 (n=60): Mean=3.13, Median=3, Mode=3, Std. deviation=.911	2005	8%	--	10%	--	42%	--	40%	--
Cohort 1 (n=46): Mean=3.17, Median=3.5, Mode=4, Std. deviation=.973 Cohort 2 (n=15): Mean=3.00, Median=3, Mode=3, Std. deviation=.926	2006	7%	7%	20%	50%	24%	40%	50%	33%
j. Individual student performance									
Cohort 1 (n=63): Mean=3.35, Median=4, Mode=4, Std. deviation=.883	2005	8%	--	3%	--	35%	--	54%	--
Cohort 1 (n=46): Mean=3.24, Median=3.5, Mode=4, Std. deviation=.947 Cohort 2 (n=15): Mean=3.13, Median=3, Mode=3, Std. deviation=.743	2006	9%	0%	9%	20%	33%	47%	50%	33%

8. How often have you used the following forms of assessment over the past year? (Continued)

	Year	% of Respondents							
		Never		Sometimes		Often		Very Often	
		C1	C2	C1	C2	C1	C2	C1	C2
k. Group performance									
Cohort 1 (n=62): Mean=2.42, Median=2, Mode=2, Std. deviation=1.017	2005	19%	--	39%	--	23%	--	19%	--
Cohort 1 (n=45): Mean=2.27, Median=2, Mode=2, Std. deviation=.939 Cohort 2 (n=15): Mean=2.07, Median=2, Mode=1, Std. deviation=1.100	2006	22%	40%	40%	27%	27%	20%	11%	13%
i. Other									
Individual presentations Participation in discussion board activities Jury review of student work									

9. Over the past year, to what degree has each of the following factors motivated you to change your course?

	Year	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
a. Desire to address varied learning styles and needs									
Cohort 1 (n=63): Mean=3.16, Median=3, Mode=4, Std. deviation=.846	2005	3%	--	19%	--	37%	--	41%	--
Cohort 1 (n=47): Mean=3.19, Median=3, Mode=3, Std. deviation=.798 Cohort 2 (n=15): Mean=3.27, Median=3, Mode=3, Std. deviation=.799	2006	2%	7%	17%	0%	40%	53%	40%	40%
b. Desire to encourage students to spend more time on learning tasks									
Cohort 1 (n=63): Mean=3.62, Median=4, Mode=4, Std. deviation=.580	2005	--	--	5%	--	29%	--	67%	--
Cohort 1 (n=47): Mean=3.53, Median=4, Mode=4, Std. deviation=.620 Cohort 2 (n=15): Mean=3.27, Median=3, Mode=3, Std. deviation=.704	2006	0%	0%	6%	13%	34%	47%	60%	40%
c. Desire to facilitate communication between students and instructors									
Cohort 1 (n=63): Mean=3.40, Median=4, Mode=4, Std. deviation=.708	2005	--	--	13%	--	35%	--	52%	--
Cohort 1 (n=47): Mean=3.23, Median=3, Mode=3, Std. deviation=.729 Cohort 2 (n=15): Mean=3.40, Median=3, Mode=3, Std. deviation=.632	2006	0%	0%	17%	7%	43%	47%	40%	47%

9. Over the past year, to what degree has each of the following factors motivated you to change your course? (Continued)

	Year	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
d. Desire to help students work more collaboratively									
Cohort 1 (n=63): Mean=2.98, Median=3, Mode=3, Std. deviation=.871	2005	5%	--	24%	--	40%	--	32%	--
Cohort 1 (n=47): Mean=3.23, Median=3, Mode=3, Std. deviation=.729 Cohort 2 (n=15): Mean=3.40, Median=3, Mode=3, Std. deviation=.632	2006	4%	0%	26%	40%	30%	53%	40%	7%
e. Desire to build on students' familiarity with technology									
Cohort 1 (n=63): Mean=2.89, Median=3, Mode=2, Std. deviation=.882	2005	3%	--	35%	--	32%	--	30%	--
Cohort 1 (n=47): Mean=2.57, Median=3, Mode=3, Std. deviation=1.037 Cohort 2 (n=15): Mean=2.73, Median=3, Mode=2, Std. deviation=.799	2006	19%	0%	26%	47%	34%	33%	21%	20%
f. Desire to increase students' access to course materials									
Cohort 1 (n=63): Mean=3.10, Median=3, Mode=3, Std. deviation=.856	2005	5%	--	24%	--	40%	--	32%	--
Cohort 1 (n=47): Mean=3.09, Median=3, Mode=3, Std. deviation=.830 Cohort 2 (n=15): Mean=3.27, Median=4, Mode=4, Std. deviation=.884	2006	4%	0%	17%	27%	45%	20%	34%	53%
g. Desire to use technology simulations to teach topics that may have been too dangerous or expensive previously									
Cohort 1 (n=63): Mean=2.42, Median=2, Mode=3, Std. deviation=1.073	2005	25%	--	25%	--	30%	--	19%	--
Cohort 1 (n=47): Mean=2.21, Median=2, Mode=1, Std. deviation=1.041 Cohort 2 (n=15): Mean=1.47, Median=1, Mode=1, Std. deviation=.516	2006	34%	53%	21%	47%	34%	0%	11%	0%

9. Over the past year, to what degree has each of the following factors motivated you to change your course? (Continued)

	Year	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
h. Desire to teach my course more efficiently									
Cohort 1 (n=61): Mean=3.64, Median=4, Mode=4, Std. deviation=.606	2005	--	--	7%	--	23%	--	71%	--
Cohort 1 (n=47): Mean=3.55, Median=4, Mode=4, Std. deviation=.619 Cohort 2 (n=15): Mean=3.53, Median=4, Mode=4, Std. deviation=.640	2006	0%	0%	6%	7%	32%	33%	62%	60%
i. Desire to expect higher quality work from my students									
Cohort 1 (n=63): Mean=3.79, Median=4, Mode=4, Std. deviation=.481	2005	--	--	3%	--	14%	--	83%	--
Cohort 1 (n=47): Mean=3.64, Median=4, Mode=4, Std. deviation=.529 Cohort 2 (n=15): Mean=3.67, Median=4, Mode=4, Std. deviation=.488	2006	0%	0%	2%	0%	32%	33%	66%	67%

10. Which items below describe the work you intend to do or have done as part of the Bush grant?

	Years	% of Respondents			
		Yes		No	
		C1	C2	C1	C2
a. New course syllabus, readings or materials	2005 (C1 n=62)	65%	--	36%	--
	2006 (C1 n=48; C2 n=16)	71%	56%	29%	44%
b. New website	2005 (C1 n=62)	71%	--	29%	--
	2006 (C1 n=48; C2 n=16)	71%	75%	29%	25%
c. New presentation tools	2005 (C1 n=61)	54%	--	46%	--
	2006 (C1 n=48; C2 n=16)	44%	56%	56%	44%
d. New communication tools	2005 (C1 n=62)	61%	--	39%	--
	2006 (C1 n=48; C2 n=16)	60%	75%	40%	25%
e. New student assignments	2005 (C1 n=62)	61%	--	39%	--
	2006 (C1 n=48; C2 n=16)	67%	81%	33%	19%
f. New instructional strategies	2005 (C1 n=62)	86%	--	15%	--
	2006 (C1 n=48; C2 n=16)	89%	94%	11%	6%

10. Which items below describe the work you intend to do or have done as part of the Bush grant?
(Continued)

	Years	% of Respondents			
		Yes		No	
		C1	C2	C1	C2
g. New technology-enhanced learning strategies	2005 (C1 n=62)	95%	--	5%	--
	2006 (C1 n=48; C2 n=16)	94%	100%	6%	0%
h. New reflection strategies	2005 (C1 n=61)	72%	--	28%	--
	2006 (C1 n=48; C2 n=16)	65%	81%	35%	19%
i. New collaborative strategies	2005 (C1 n=62)	76%	--	24%	--
	2006 (C1 n=47; C2 n=16)	64%	69%	36%	31%
j. New ways to address student learning styles	2005 (C1 n=61)	72%	--	28%	--
	2006 (C1 n=47; C2 n=16)	70%	75%	30%	25%
k. New classroom assessment methods or instruments	2005 (C1 n=62)	71%	--	29%	--
	2006 (C1 n=48; C2 n=16)	58%	75%	42%	25%
l. New grading techniques	2005 (C1 n=62)	86%	--	15%	--
	2006 (C1 n=48; C2 n=16)	81%	81%	19%	19%
m. New software or tailored application	2005 (C1 n=62)	42%	--	58%	--
	2006 (C1 n=47; C2 n=16)	47%	63%	53%	37%
Other: Sketchbook drawing program (1)					

SECTION C: SCHOLARSHIP AND COLLABORATION

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching.

	Years	% of Respondents								
		None		Low		Moderate		High		
		C1	C2	C1	C2	C1	C2	C1	C2	
11. Using active learning techniques such as small group discussions and team projects.										
Cohort 1 (n=63): Mean=3.19, Median=3, Mode=4, Std. deviation=.895	2005	3%	--	22%	--	27%	--	48%	--	
Cohort 1 (n=47): Mean=3.21, Median=3, Mode=3, Std. deviation=.750 Cohort 2 (n=16): Mean=2.88, Median=2.5, Mode=2, Std. deviation=1.088	2006	4%	6%	6%	44%	53%	6%	36%	44%	

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching. (Continued)

	Years	% of Respondents								
		None		Low		Moderate		High		
		C1	C2	C1	C2	C1	C2	C1	C2	
12. Using information in your course(s) from recent articles, books, or topics										
Cohort 1 (n=63): Mean=3.35, Median=4, Mode=4, Std. deviation=.845	2005	2%	--	19%	--	22%	--	57%	--	
Cohort 1 (n=47): Mean=3.15, Median=3, Mode=3, Std. deviation=.691 Cohort 2 (n=16): Mean=3.44, Median=3.5, Mode=4, Std. deviation=.629	2006	2%	0%	11%	6%	57%	44%	30%	50%	
13. Using technology in your teaching.										
Cohort 1 (n=62): Mean=3.37, Median=4, Mode=4, Std. deviation=.773	2005	2%	--	13%	--	32%	--	53%	--	
Cohort 1 (n=47): Mean=3.19, Median=3, Mode=3, Std. deviation=.825 Cohort 2 (n=16): Mean=3.56, Median=4, Mode=4, Std. deviation=.512	2006	4%	0%	13%	0%	43%	44%	40%	56%	
14. Overseeing student independent research or creative work.										
Cohort 1 (n=63): Mean=2.60, Median=3, Mode=3, Std. deviation=1.040	2005	18%	--	29%	--	30%	--	24%	--	
Cohort 1 (n=47): Mean=2.11, Median=2, Mode=1, Std. deviation=1.026 Cohort 2 (n=16): Mean=2.69, Median=2.5, Mode=2, Std. deviation=1.078	2006	34%	13%	34%	38%	19%	19%	13%	31%	
15. Informally studying the effects of your teaching on student learning.										
Cohort 1 (n=62): Mean=3.11, Median=3, Mode=3, Std. deviation=.812	2005	3%	--	18%	--	44%	--	36%	--	
Cohort 1 (n=47): Mean=2.96, Median=3, Mode=3, Std. deviation=.806 Cohort 2 (n=16): Mean=2.81, Median=3, Mode=3, Std. deviation=.750	2006	4%	0%	21%	38%	49%	44%	26%	19%	
16. Taking into account differences among students in how they learn.										
Cohort 1 (n=63): Mean=3.06, Median=3, Mode=3, Std. deviation=.859	2005	5%	--	19%	--	41%	--	35%	--	
Cohort 1 (n=47): Mean=3.02, Median=3, Mode=3, Std. deviation=.794 Cohort 2 (n=16): Mean=2.75, Median=3, Mode=2, Std. deviation=.931	2006	4%	6%	17%	38%	51%	31%	28%	25%	

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching. (Continued)

	Years	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
17. Using interdisciplinary knowledge to inform your course design.									
Cohort 1 (n=63): Mean=2.89, Median=3, Mode=3, Std. deviation=.918	2005	8%	--	24%	--	40%	--	29%	--
Cohort 1 (n=47): Mean=2.66, Median=3, Mode=3, Std. deviation=.915 Cohort 2 (n=16): Mean=2.69, Median=3, Mode=2, Std. deviation=1.014	2006	13%	13%	26%	31%	45%	31%	17%	25%
18. Implementing team teaching or other collaborative approaches in courses.									
Cohort 1 (n=63): Mean=2.14, Median=2, Mode=2, Std. deviation=.965	2005	30%	--	35%	--	25%	--	10%	--
Cohort 1 (n=46): Mean=2.02, Median=2, Mode=1, Std. deviation=.954 Cohort 2 (n=16): Mean=1.94, Median=1.5, Mode=1, Std. deviation=1.124	2006	37%	50%	31%	19%	26%	19%	7%	13%
19. Updating your knowledge of your discipline.									
Cohort 1 (n=62): Mean=3.37, Median=4, Mode=4, Std. deviation=1.044	2005	10%	--	13%	--	8%	--	69%	--
Cohort 1 (n=47): Mean=3.28, Median=4, Mode=4, Std. deviation=.852 Cohort 2 (n=16): Mean=3.31, Median=3, Mode=3, Std. deviation=.704	2006	2%	0%	19%	13%	28%	44%	51%	44%
20. Including multicultural perspectives in appropriate courses.									
Cohort 1 (n=63): Mean=2.68, Median=3, Mode=2, Std. deviation=1.029	2005	13%	--	35%	--	24%	--	29%	--
Cohort 1 (n=47): Mean=2.55, Median=3, Mode=4, Std. deviation=1.157 Cohort 2 (n=16): Mean=2.47, Median=3, Mode=1, Std. deviation=1.246	2006	26%	33%	21%	13%	26%	27%	28%	27%
21. Using comments from students to alter teaching practices or materials.									
Cohort 1 (n=63): Mean=3.27, Median=3, Mode=4, Std. deviation=.787	2005	3%	--	11%	--	41%	--	44%	--
Cohort 1 (n=47): Mean=3.34, Median=3, Mode=4, Std. deviation=.700 Cohort 2 (n=16): Mean=2.94, Median=3, Mode=3, Std. deviation=.772	2006	0%	0%	13%	31%	40%	44%	47%	25%

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching. (Continued)

	Years	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
22. Helping students make connections between their prior learning and new knowledge.									
Cohort 1 (n=63): Mean=3.51, Median=4, Mode=4, Std. deviation=.669	2005	--	--	10%	--	30%	--	60%	--
Cohort 1 (n=46): Mean=3.35, Median=3, Mode=4, Std. deviation=.674 Cohort 2 (n=16): Mean=3.25, Median=3.5, Mode=4, Std. deviation=.856	2006	0%	0%	11%	25%	44%	25%	46%	50%
23. Using a variety of techniques in assessing student learning in your courses.									
Cohort 1 (n=63): Mean=3.37, Median=4, Mode=4, Std. deviation=.809	2005	3%	--	11%	--	32%	--	54%	--
Cohort 1 (n=47): Mean=3.36, Median=3, Mode=4, Std. deviation=.673 Cohort 2 (n=16): Mean=3.00, Median=3, Mode=3, Std. deviation=.894	2006	0%	0%	11%	38%	43%	25%	47%	38%
24. Relating concepts in your courses to real life, such as through problem-based or service learning.									
Cohort 1 (n=62): Mean=3.45, Median=4, Mode=4, Std. deviation=.761	2005	2%	--	11%	--	27%	--	60%	--
Cohort 1 (n=47): Mean=3.30, Median=4, Mode=4, Std. deviation=.907 Cohort 2 (n=16): Mean=2.81, Median=3, Mode=3, Std. deviation=.834	2006	4%	6%	17%	25%	23%	50%	55%	19%
25. Making connections to other disciplines for students.									
Cohort 1 (n=63): Mean=2.95, Median=3, Mode=3, Std. deviation=.906	2005	8%	--	19%	--	43%	--	30%	--
Cohort 1 (n=46): Mean=2.85, Median=3, Mode=3, Std. deviation=.942 Cohort 2 (n=16): Mean=2.81, Median=3, Mode=3, Std. deviation=.981	2006	9%	13%	26%	19%	37%	44%	28%	25%
26. Meeting informally with students outside of class, labs, or studios.									
Cohort 1 (n=62): Mean=2.69, Median=3, Mode=3, Std. deviation=1.065	2005	18%	--	23%	--	32%	--	27%	--
Cohort 1 (n=46): Mean=2.65, Median=3, Mode=3, Std. deviation=.924 Cohort 2 (n=16): Mean=2.88, Median=3, Mode=4, Std. deviation=1.088	2006	11%	13%	33%	25%	37%	25%	20%	38%
27. Providing written comments to students on their assignments and exams.									
Cohort 1 (n=62): Mean=3.10, Median=3, Mode=4, Std. deviation=.900	2005	5%	--	21%	--	34%	--	40%	--
Cohort 1 (n=46): Mean=2.89, Median=3, Mode=4, Std. deviation=1.038 Cohort 2 (n=16): Mean=2.88, Median=3, Mode=3, Std. deviation=.885	2006	11%	6%	26%	25%	26%	44%	37%	25%

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching. (Continued)

	Years	% of Respondents								
		None		Low		Moderate		High		
		C1	C2	C1	C2	C1	C2	C1	C2	
28. Providing prompt feedback to students about their exam results and assignments.										
Cohort 1 (n=62): Mean=3.58, Median=4, Mode=4, Std. deviation=.737	2005	3%	--	5%	--	23%	--	69%	--	
Cohort 1 (n=47): Mean=3.49, Median=4, Mode=4, Std. deviation=.718 Cohort 2 (n=16): Mean=3.50, Median=4, Mode=4, Std. deviation=.816	2006	0%	6%	13%	0%	26%	31%	62%	63%	
29. Using examples or illustrations to clarify course material.										
Cohort 1 (n=63): Mean=3.78, Median=4, Mode=4, Std. deviation=.552	2005	2%	--	2%	--	14%	--	83%	--	
Cohort 1 (n=47): Mean=3.55, Median=4, Mode=4, Std. deviation=.619 Cohort 2 (n=16): Mean=3.63, Median=4, Mode=4, Std. deviation=.719	2006	0%	0%	6%	13%	32%	13%	62%	75%	
30. Setting high expectations for all students.										
Cohort 1 (n=61): Mean=3.80, Median=4, Mode=4, Std. deviation=.542	2005	2%	--	2%		12%	--	85%	--	
Cohort 1 (n=47): Mean=3.53, Median=4, Mode=4, Std. deviation=.654 Cohort 2 (n=16): Mean=3.38, Median=3, Mode=3, Std. deviation=.619	2006	0%	0%	9%	6%	30%	50%	62%	44%	
31. Providing syllabi with course objectives, assignments, and grading procedures.										
Cohort 1 (n=62): Mean=3.77, Median=4, Mode=4, Std. deviation=.663	2005	3%	--	3%	--	7%	--	87%	--	
Cohort 1 (n=47): Mean=3.81, Median=4, Mode=4, Std. deviation=.495 Cohort 2 (n=16): Mean=3.44, Median=3.5, Mode=4, Std. deviation=.629	2006	0%	0%	4%	6%	11%	44%	85%	50%	
32. Discussing with colleagues your course content, materials, assessment techniques, and the like.										
Cohort 1 (n=63): Mean=3.25, Median=3, Mode=4, Std. deviation=.761	2005	2%	--	14%	--	41%	--	43%	--	
Cohort 1 (n=47): Mean=3.26, Median=3, Mode=3, Std. deviation=.706 Cohort 2 (n=16): Mean=2.69, Median=3, Mode=3, Std. deviation=.946	2006	0%	13%	15%	25%	45%	44%	40%	19%	
33. Participating in conferences, seminars, or workshops on teaching or student learning.										
Cohort 1 (n=63): Mean=3.19, Median=3, Mode=3, Std. deviation=.780	2005	2%	--	18%	--	41%	--	40%	--	
Cohort 1 (n=47): Mean=2.96, Median=3, Mode=3, Std. deviation=.806 Cohort 2 (n=16): Mean=2.88, Median=3, Mode=3, Std. deviation=1.025	2006	2%	13%	28%	19%	43%	38%	28%	31%	

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching. (Continued)

	Years	% of Respondents							
		None		Low		Moderate		High	
		C1	C2	C1	C2	C1	C2	C1	C2
34. Presenting on your discipline in a colleague's class.									
Cohort 1 (n=62): Mean=2.31, Median=2, Mode=2, Std. deviation=.879	2005	19%	--	36%	--	34%	--	8%	--
Cohort 1 (n=47): Mean=1.87, Median=2, Mode=1, Std. deviation=.992 Cohort 2 (n=16): Mean=1.81, Median=1.5, Mode=1, Std. deviation=1.047	2006	45%	50%	34%	31%	11%	6%	11%	13%
35. Inviting colleagues to review your syllabi or teaching materials.									
Cohort 1 (n=62): Mean=2.69, Median=3, Mode=3, Std. deviation=.985	2005	16%	--	19%	--	44%	--	21%	--
Cohort 1 (n=46): Mean=2.39, Median=2.5, Mode=3, Std. deviation=.954 Cohort 2 (n=16): Mean=2.19, Median=2, Mode=1, Std. deviation=1.047	2006	22%	31%	28%	31%	39%	25%	11%	13%
36. Making your course syllabi available to anyone on the Internet or other public sources.									
Cohort 1 (n=62): Mean=2.85, Median=3, Mode=4, Std. deviation=1.053	2005	15%	--	19%	--	32%	--	34%	--
Cohort 1 (n=47): Mean=2.85, Median=3, Mode=4, Std. deviation=1.083 Cohort 2 (n=16): Mean=3.06, Median=3.5, Mode=4, Std. deviation=1.063	2006	15%	6%	21%	31%	28%	13%	36%	50%
37. Preparing a portfolio or dossier to support your teaching performance.									
Cohort 1 (n=62): Mean=2.55, Median=3, Mode=2, Std. deviation=1.051	2005	19%	--	29%	--	29%	--	23%	--
Cohort 1 (n=47): Mean=2.21, Median=2, Mode=1, Std. deviation=1.062 Cohort 2 (n=16): Mean=2.25, Median=2, Mode=2, Std. deviation=1.183	2006	32%	31%	30%	38%	23%	6%	15%	25%

For the past year, please indicate the priority you have given to the following policies and/or practices as they relate to your teaching. (Continued)

	Years	% of Respondents								
		None		Low		Moderate		High		
		C1	C2	C1	C2	C1	C2	C1	C2	
38. Working with an undergraduate to further inform your course design.										
Cohort 1 (n=61): Mean=2.52, Median=3, Mode=3, Std. deviation=1.134	2005	27%	--	20%	--	30%	--	25%	--	
Cohort 1 (n=47): Mean=2.30, Median=2, Mode=1, Std. deviation=1.178 Cohort 2 (n=16): Mean=1.75, Median=1, Mode=1, Std. deviation=1.000	2006	36%	56%	19%	19%	23%	19%	21%	6%	
39. Working with a Teaching Assistant to further inform your course design.										
Cohort 1 (n=61): Mean=2.13, Median=2, Mode=1, Std. deviation=1.132	2005	41%	--	21%	--	21%	--	16%	--	
Cohort 1 (n=47): Mean=1.96, Median=1, Mode=1, Std. deviation=1.197 Cohort 2 (n=16): Mean=1.88, Median=1, Mode=1, Std. deviation=1.088	2006	55%	56%	11%	6%	17%	31%	17%	6%	
40. Working with other faculty to further inform your course design.										
Cohort 1 (n=61): Mean=2.90, Median=3, Mode=3, Std. deviation=.978	2005	10%	--	23%	--	34%	--	33%	--	
Cohort 1 (n=46): Mean=2.48, Median=2.5, Mode=3, Std. deviation=.960 Cohort 2 (n=16): Mean=2.25, Median=2, Mode=2, Std. deviation=.856	2006	17%	19%	33%	44%	35%	31%	15%	6%	
41. Working with consultants to further inform your course design.										
Cohort 1 (n=61): Mean=2.20, Median=2, Mode=1, Std. deviation=1.093	2005	34%	--	28%	--	21%	--	16%	--	
Cohort 1 (n=47): Mean=2.26, Median=2, Mode=1, Std. deviation=1.188 Cohort 2 (n=16): Mean=1.75, Median=1.5, Mode=1, Std. deviation=.931	2006	38%	50%	19%	31%	21%	13%	21%	6%	

42. At the end of the grant, what criteria will you use to determine whether your participation in the grant was worthwhile?

Based on the qualitative analysis of open-ended responses, the two main criteria identified that will be used to determine whether participation in the grant was worthwhile at grant completion were: 1) improved student performance (including an improvement in engagement, satisfaction, and attendance) and 2) improvement of faculty ratings through student evaluation. Participants expect to see a greater understanding of the material by students and improved performance on exams and project work. Participants also intend to identify and implement new teaching and assessment strategies and would like to see a higher percentage of student success.

APPENDIX D:
Course Profiles

APPENDIX D COURSE PROFILES

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: UMC

Faculty Member(s)/Instructor: Ken Myers

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 2

Course Impacted by Research (e.g., Theatre History TH 3171): HRI 3900 Internship (secondary class is "Cases and Trends in Hospitality Management")

Course Description: *(Please provide the course overview that appears in course bulletins)*

Supervised professional work experience at selected sites. Reports/ consultation with faculty adviser/employer.

Student Learning/Teaching Issue/Research Question:

How well the student is able to (when an on-the-job situation takes place) identify the peripheral information vs. key facts and issues of a situation and write a reflective analysis of what happened as well as showing choices (options) and there strengths and weaknesses.

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

We will take the list of students that are registered for internship and identify those students who would be able to participate in this project (example: eliminating those that won't have internet connections) and then randomly select from those the students will be participating in this activity. Participating students will be divided into groups (Web Discussion Groups) of (4 - 6) four - six. We anticipate approximately (6 - 8) six to eight groups (3-4 HRI and 3-4 Mgmt). (Estimated students doing internship this summer are: HRI 20+; Mgmt 20+).

Students will be placed into small Web Discussion Groups (the same groups discussed in the above paragraph) so that they only have a limited number of cases to read and select one to respond to.

A Case example will be written by the instructors to help students understand how to write a situational review (complete the Situational Documentation Form).

Students will be required to write one Situational Review each week for a minimum of eight weeks. These reviews will be sent to the instructor each week (Monday) via email. The Situational Reviews will be posted on the web.

Students will also be asked on the Situational Documentation Form: What did you learn from this experience?

Faculty will respond via email or phone with feedback (questions, comments) based on what the student submitted on the Situational Documentation Form.

Student names will not be used on the posted case reviews, nor will the situations identify the name of the establishment or the actual names of those involved for this part of the activity.

Students will review those cases posted in their Web Discussion Groups and be required to post comments on at least one of the cases.

As fall semester starts, students will meet as a group with the instructors and each student will present (1) one case that they felt was the most significant learning experience and why. Participants will have an opportunity to ask questions and discuss the situation.

Students will complete a brief survey regarding the situational learning experience they participated in.

Example of flow during 10 week summer experience of 8 cases: (A calendar will be developed to help students understand what activity they need to do each week).

Week 1: Student (Sunday – Saturday) observes / experiences situation #1

Week 2:

- A) Student submits (Monday) case #1 review
- B) Student (Sunday – Saturday) observes / experiences situation #2
- C) Faculty reads case #1 (Wednesday) and gives feedback to student
- D) Faculty posts case #1 (Friday) on web

Week 3:

- A) Student submits (Monday) case #2 review
- B) Student goes to web, reads posted cases in their Web Discussion Group (about 4-6 cases) (Case #1) and posts comments on a minimum of one case (Monday – Wednesday)
- C) Student (Sunday – Saturday) observes / experiences situation #3
- D) Faculty reads case #2 (Wednesday) and gives feedback to student
- E) Faculty posts case #2 (Friday) on web

Evaluation Plan:

We will develop standardized interview protocols and/or survey questions that will serve as the framework for the analysis. If, for example the students are interviewed, all will be asked the same questions in the same order (example: Do you think this helped you...; How do you think this helped you...)

Summary of Outcomes:

Example: Student survey data revealed . . .

Survey Samples

•Did you enjoy the learning opportunity of participating in writing and reading situationals?

—Yes = 100%

Survey Samples

•Was the situational web page we provided to help guide you, informative (Situational examples, calendar to follow, directions, etc.)?

—Yes = 100%

Survey Samples

•Were the six (6) situationals you completed during the 10 week period the right number?

—About the right number = 60%

—Too Many = 20%

—Too Few = 20%

Survey Samples

•Did completing the situationals help you look more closely at the situation and consider possible alternative options?

—Yes = 100%

Survey Samples

•Would you like to receive a copy of all the situationals that were used in your chat rooms as a reference?

—Yes = 20%

Survey Samples

•Did participating in the forum (chat room) give you a chance to better appreciate the situations you and others face?

—Yes = 100%

Student Comments

•The thought of having to do them was daunting but once I finished all of the situationals I still found myself looking for them at work.

•For sure it's like a support group of managers.

•It was interesting to learn what other students were dealing with and how everyone dealt with those problems.

•Especially when I have encountered situations similar to the situations discussed in the forum.

•It is nice to be able to see that other students are dealing with the same situations and it helps to have others comments on the situation.

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

The full project was run for a second semester. There were minor changes made prior to doing the project the second term. The key change was the number of situational that the students had to participate in were reduced from 8 situationals to 6 situationals. The key reasons were that the majority of students felt that the number were too many and I also realized that it was difficult for students to complete as many as originally planned and participate in the online forums given the number of weeks that students may average some summers on their internship experience.

What successes have you experienced with your work/project?

Based on feedback I have had great success. This year the implementation went very smooth as only minor refinements were needed. Students were able to practice posting comments in a special forum and most attended an orientation meeting prior to leaving on their internships.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

The only real problem was momentary when a couple students were not listed in the system and were not able to be added to Moodle the same time as others. It took a couple days for the experts to identify what was causing this and correct it. After that, everything went smoothly.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

For next term there will be no adjustments. We will run it again exactly like it was this last term.

How are you using collaboration within your project?

Two ways:

- 1- In the situational forums, students share situations with each other and receive comments and questions.
- 2- The situationals are being compiled in an indexed PDF format and being used in another class (Cases and Trends in Hospitality Management). In this class we do look at selected situations and discuss the possible cause, options in dealing with the situation, as well as how to reduce or eliminate the likelihood of some of these happening in the future.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

At this point two presentations have been made to faculty. One was a coordinated event over ITV with other campuses in the University of Minnesota system. The other was at a UMC faculty workshop on dinner.

I am attempting to coordinate a presentation at a regional hospitality educational conference / meeting.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: Crookston

Faculty Member(s)/Instructor: Behrooz Sedaie

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): one

Course Impacted by Research: Econ 2101 Microeconomics

Course Description: *(Please provide the course overview that appears in course bulletins)*

Basic economic principles of resource allocation, demand and supply, market equilibrium and pricing. Theory of production and costs. Perfect competition and monopoly. Factor markets and factor pricing. Public goods and externalities.

Student Learning/Teaching Issue/Research Question:

Is collaborative learning teaching method more effective than traditional lecture method on students' achievement in learning economics?

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

The research involves a controlled experiment in which students enrolled in the course in the Fall 2005 semester were treated as the control group and were taught using the traditional lecture method. Students enrolled in the course in the Spring 2006 semester were treated as the experimental group and were taught with a collaborative learning teaching method. In both semesters a web-based polling system was used to ask questions from students during class time to which students responded in real time using their own computers. In the control group students answered the questions individually, but in the experimental group students were required to discuss the questions in small groups before registering their answers. Students' achievement in learning microeconomics was measured using the standardized Test of Understanding in College Economics (TUCE). An educational production function was specified and was estimated using regression analysis.

Evaluation Plan:

Estimation of the educational production function using regression analysis will show whether collaborative learning teaching method is more effective than the traditional lecture method. Regression analysis allows to controls for the effect of other variables that have been shown in the research literature to affect student learning (such as student gender and minority status, ability, effort, prior economic and algebraic knowledge, etc.) and detects any effect on student learning that is due to collaborative learning.

Summary of Outcomes:

Example: Student survey data revealed . . .

Preliminary results from estimations indicate that collaborative learning teaching method positively and significantly affects students' stock of knowledge at the end of the semester as compared to a traditional lecture method. On the average each student in the collaborative group gave 2.5 more correct answers on the instructor made final exam and 2.2 more correct answers on post TUCE as compared to students in the control group.

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

Spring 2006 semester classes started on January 9 and I administered both The Test of Understanding in College Economics (TUCE) as a pretest and my pre-survey questionnaire to my students on January 11. The purpose of the pre-survey questionnaire was to collect from students some of the data that would be used in the research analysis.

During the months of February, March, and April I continued the practice of collaborative learning in my microeconomics classes which formed the experimental group in my research project. During each class I asked students several questions using the Web-based polling system, and they answered the questions after having discussions in groups of two to four students.

In May, which is the month of final examinations, I administered the Test of Understanding in College Economics to my students as a post test. I also administered a post survey questionnaire to my students in order to collect additional data from students that would be used in the statistical analysis of the project.

During the month of July I started the process of converting the information that I collected from my students during the Fall 2005 and Spring 2006 semesters into an electronic data set that could be read by a software package for the purpose of statistical analysis. I coded students' responses in the pre and post survey questionnaires and entered every student's responses into the computer in a text file format in order to create the electronic data set. During those two semesters I collected information from 119 students and so the electronic data set I created has 119 observations. But there were other data that need to be part of the data set and had to be obtained from other sources. These included students' ACT math and composite scores, cumulative GPA, total credit hours completed, and term credit hours attempted which I requested from UMC's Registrar Mr. Bob Nelson. I provided Mr. Nelson with an electronic list of all students in my sample together with their student ID numbers. Mr. Nelson could provide most, but not all, of these data electronically in an Excel file.

In August I completed the process of creating an electronic data set based on information collected from my students during the 2005-06 academic year as well as from the university sources. I finished inspecting students' files physically in the Office of the Registrar and obtained information on their ACT math and ACT composite scores and also on the number of credit hours of college algebra and economics that they had completed. This information, together with additional data such as students' final exam scores and pre- and post-TUCE scores and course grades were incorporated into the electronic data set.

During the month of September I used a sample of 89 students from my microeconomics courses during the 2005-06 academic year to estimate the educational production function that I had specified earlier in this research project. The purpose was to have some preliminary result on the effectiveness of collaborative learning in introductory microeconomics classes. Also, in order to have a larger sample for a final analysis I decided to continue my experiment with collaborative learning during the Fall 2006 semester and administered pre-TUCE and pre-survey questionnaire to my students.

During the months of October, November, and December I continued with the use of collaborative learning in my microeconomics courses. I submitted an abstract of my research to Midwest Economic Association for presentation at their 2007 annual meeting. I administered post-TUCE and post-survey questionnaire to my students, and attended faculty learning community meetings at UMC.

What successes have you experienced with your work/project?

Collaborative learning teaching method was used successfully in my microeconomics courses and students seemed to enjoy it. Administration of pre- and post-TUCE, pre and post survey questionnaire, and collection of data from students and university sources have been completed according to the plans. Preliminary statistical analysis and estimations have been completed, and the research has been accepted for presentation at the 2007 annual meeting of the Midwest Economic Association which will take place in March in Minneapolis.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

There were a few students who seemed not to like the idea of collaboration in a group and would rather answer my questions individually. I had to encourage them repeatedly to discuss the questions with other students. There were also a few students who occasionally did not bring their computers to classroom. In such cases I still asked them to be part of a group and participate in group discussions even though they were not able to record their answers in the polling system using their computers.

Also, data entry is a time consuming activity and so creating the electronic data set took longer than I had hoped. There was also the additional problem that UMC's registrar could not provide any data in electronic format for the number of college algebra credit hours that students had completed. To obtain data on college algebra credit hours (which for some students are transfer credits) I had to inspect physically the files of students in the Office of the Registrar which took even longer than simple data entry.

During the 2005-06 academic year I collected data from 107 students. Some students withdrew from the course and therefore did not complete the post-survey questionnaire and did not take the post-TUCE. These students could not be included in the analysis of the data because of incomplete information. This reduced the number of students who could be included in the analysis to 89 which made a relatively small sample. I based my preliminary analysis of the data on this rather small sample of 89 students. The preliminary results, while showing that collaborative learning has a statistically significant effect on students' stock of knowledge at the end of the semester, they did not indicate that its effect on students' learning from the beginning to the end of the semester (the flow of learning) was statistically significant.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

The data analysis using regression showed that the effect of collaborative learning method on the flow of learning (the percentage of the gap between the maximum possible TUCE score and the pre-TUCE score that is closed by the end of the semester) was rather large but lacked statistical significance. I believe that this lack of statistical significance is most probably due to the small sample of 89 observations that I had available for preliminary analysis. To make sure that my final analysis and results do not suffer from limitations of a small sample I have decided to continue with my project and collect data from students who take my courses during the 2006-07 academic year in order to make my sample larger and therefore give my results more statistical validity.

How are you using collaboration within your project?

I use collaborative learning in my experimental classes. In these classes students are divided into small groups. When I ask questions during the class time using the polling system, students in each group are required to discuss the questions with each other before they register their answers in the system.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

I made a literature review of collaborative learning in economics education before I started implementation of my project. I also have used economics education literature to identify other factors than teaching method (such as personal characteristics, ability, effort, prior algebraic and economic knowledge, working on a job, etc.) that affect students' achievement in learning economics. This information is needed for specification of an educational production function and detection of the effect of collaborative learning. Most of the articles I have used are published in the *Journal of Economic Education*. These include papers by authors such as Becker and Salemi (1977), Beron (1990), Brasfield et al (1993), D' Amico (1984), Heath (1989), Johnson et al (2000), Lillydahl (1990), Lopus (1997), Manahan (1983), Moore (1998), Paul (1982), Polacheck et al (1978), Price et al (1981), and Waistad and Robson (1997).

I myself presented my research and its preliminary results to a group of UMC faculty in a faculty learning community meeting in December. In March 2007 I am going to present the paper that I am writing on the basis of my preliminary results at the 2007 annual meeting of the Midwest Economic Association which will take place in Minneapolis, Minnesota.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: UMD

Faculty Member(s)/Instructor: James Allert

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 10

Course Impacted by Research (e.g., Theatre History TH 3171):

Computer Science I (CS-1511) and Intro to Programming in Visual Basic (CS-1121)

Course Description: *(Please provide the course overview that appears in course bulletins)*

CS-1511 Introduction to the discipline of computer science and its theoretical foundations. Introduction to structured programming, problem analysis and solution design, data abstraction, and ethical and social issues. Students will learn a high-level programming language. Requires design and implementation of computational solutions to sample problems.

CS-1121 Introduction to programming in Visual Basic.NET, including event-driven Windows programming, data types, operators, objects and properties, menus, procedures, control structures, and database file processing. For students with no prior programming experience.

Student Learning/Teaching Issue/Research Question:

This project seeks to improve the learning environment in several large lecture classes by introducing a series of reflective opportunities that students can use to 1) come to understand themselves as learners, 2) state their initial goals and strategies for the course, 3) determine whether their strategy was effective after each exam and allow them to reformulate a new one based on dropping unproductive methods, 4) reflect back on the course as a whole and their growth as learners.

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

The four areas listed above are served by four measurement tools:

- 1) An online learning styles survey (Soloman-Felder ILS)
- 2) A first week statement of goals and strategies
- 3) Post-exam reflection (online survey, done after each exam)
- 4) Web logs tracking student use of online materials

Evaluation Plan:

ILS instrument and post-exam analysis data are gathered using TestPilot (an online tool). The goals and strategies are hand-coded. Web data is gathered by a cgi script that logs webpage hits, or by WebCT for classes using it.

Data is currently being assembled in a master database from which comparative analyses can be run.

Summary of Outcomes:

Learning style profiles have been compiled each semester during the first week of class and are shared with the students during the second week. Profiles reveal strong visual learning preferences and tendencies toward sequential, sensory approaches to learning. The ILS data has not been correlated yet with the post-exam reflection data.

Reflection Log/Status: (To be updated at a minimum bi-monthly)**Describe the activities/work you have completed since the last time you reported.**

Data gathering:

Three post exam analyses have been collected from both classes. Data has been entered but not analyzed.

Web log data from both classes continues to be collected.

Web log data from all of last years classes has been formatted and analysis will begin shortly.

What successes have you experienced with your work/project?

I made huge changes to one of the study courses this year based on information collected from this research on learning styles. As a result, the textbook became obsolete and I had to write all new projects, notes, labs (over 600 pages!). Since there are no textbooks that apply to this approach I have turned the material over to a publishing company to see if they are interested. As far as the course goes I have received amazing responses from students, for example: "I don't want this course to end." I believe student course evaluations will be very high.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

Time for data analysis is the big problem. I teach 3 courses per semester (usually two large ones and one average sized) and there just does not seem to be enough time to get down to analyzing the data.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

The project is going quite well. Feedback from students has been VERY positive. I am now considering revising the curriculum in all of the large lecture courses to match what is going on in computer science I.

How are you using collaboration within your project?

My approach is being passed on to the person who teaches computer science II and he is revising his course. We are working together on this and he has applied for the next round of the grant.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

As a result of one of my smaller presentations I have been invited to give the presentation again at a meeting of all faculty in the College. This meeting was called specifically for the purpose of allowing me to make the presentation by the Associate Dean. With luck I will have some time to process additional data before then.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: UMD

Faculty Member(s)/Instructor: Colleen Belk

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): one

Course Impacted by Research (e.g., General Biology Biol 1011)

Course Description: *(Please provide the course overview that appears in course bulletins)*

Fundamental concepts of biology including chemical basis of life, cell structure and function, energy transformations, photosynthesis, cellular respiration, genetics, molecular biology, DNA technology, development, origin of life and evolution.

Student Learning/Teaching Issue/Research Question:

I would like to find some way for students to improve their ability to assess their understanding. So many students indicate that they thought they knew the material but performed poorly on exams. I would also like to find some way to help students learn how to “think” like a scientist. To move away from memorization towards understanding.

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

Fall 2005 and Spring 2006 gave students “practice exams” consisting of 20 multiple choice questions after every three chapters covered. Fall of 2006 did not give practice exams before exam I. Will give practice exams before exam II and will query students as to benefits of “practice exams”.

Evaluation Plan:

Will compare scores on first exam (which included pre-exam practice tests) against scores on second exam (which will not include pre-exam practice tests). By comparing average scores on exam I and II versus Fall of 2005 can determine whether “practice exams” help student learning. Will also obtain student feedback to determine whether they thought these practice exams helped them learn. Also, will compare scores on same multiple choice exam for two different semesters with and without practice exams.

Summary of Outcomes:

- 1) Exam I and Exam II same semester showed 2.2 points improvement with practice exams.
- 2) Compared scores using same exam from 2 different semesters to see if practice exams helped. Students scored 4 points higher on same exam with practice exams.

Reflection Log/Status: (To be updated at a minimum bi-monthly)**Describe the activities/work you have completed since the last time you reported.**

Attended small group meetings with other science faculty. Attended Bush group meetings and Breeze presentations of Bush funded research.

Analyzed data from student survey regarding practice exam. Showed that students liked the practice exams and that they felt it helped them gauge their level of understanding prior to taking the exam.

Presented results to Bush Group Colloquium III: Modeling Critical Thinking in the Lecture Hall.

What successes have you experienced with your work/project?

Exams given after practice exams show improvement in scores. Students appreciate practice exams and believe they help them learn to think about the material and better gauge their understanding. Currently working with department to change structure of course to allow more opportunities for students to practice this type of thinking.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)**What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?**

My department is considering adding "discussion sections" to the course to allow more opportunity to model critical thinking. This will move the practice exams to a small group discussion format with more opportunity for interaction and practice.

How are you using collaboration within your project?

N/A

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

Belzer, S.; Miller, M.; and Hoemake, S. Concepts in Biology: A Supplemental Study Skills Course Designed To Improve Introductory Students' Skills for Learning Biology. *The American Biology Teacher* Volume 65, Issue 1 (January 2003) pp. 30–40.

Burrowes, P.A A Student-Centered Approach to Teaching General Biology That Really Works: Lord's Constructivist Model Put to a Test. *The American Biology Teacher*. Volume 65, Issue 7 (September 2003) pp. 491–502.

Marocco, D Biology for the 21st Century: The Search for a Core. *The American Biology Teacher* Volume 62, Issue 8 (October 2000) pp. 565–569.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: University of Minnesota Duluth

Faculty Member(s)/Instructor: Lynn Bye

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.):

Course Impacted by Research (e.g., Theatre History TH 3171): SW8331 Organization and Community Practice II

Course Description: *(Please provide the course overview that appears in course bulletins)*

The course prepares students for advanced practice in organizations and communities. It provides a framework for assessing and intervening in organizational communities using an asset-based and problem-solving approach. Specific strategies and tactics for strengthening organizations and communities are addressed.

Student Learning/Teaching Issue/Research Question:

The objective of my study is to gain a better understanding of the impact of reflection using web-x discussion on: 1) student learning, and 2) student satisfaction with the course. The hypothesis is that students who share reflection papers with each other using the web-x discussion format will report that they learned more and are more satisfied with the course than students who simply turn written reflections into me for feedback.

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

The research design is experimental. This past fall semester I taught two sections of the same course (SW8331). To select the experimental group I randomly drew one of the course sections out of a hat. The other section served as the control group. The experimental group was required to do weekly reflections on the reading using WebX, a web-based method where the students were required to respond to each other's reflection. The other (control) group was required to hand in hardcopy reflections to the instructor and they were not shared with each other.

Evaluation Plan:

All students took a pre and post self assessment regarding how much they feel they know about specific course content. End of the semester course evaluations will be used to evaluate differences in levels of satisfaction with the course between the experimental and control groups. Students in both groups were also asked to take the Kolb Learning Styles Inventory to assess the potential influence of learning styles.

Summary of Outcomes:

I am in the process of analyzing the data. A T-test on the mean score of the post-course ratings on "student hopes for the course" was statistically significant at the .01 level (17df). Students in the group that participated in the weekly webx discussions indicated higher rates of accomplishing what they hoped in the course than those who turned in weekly paper reflections to the instructor. There was no significant difference between groups in the level of satisfaction with the course as determined by the End of the Semester Course Evaluation. I am still going to run a few additional t-tests and will also analyze the qualitative data.

Reflection Log/Status: (To be updated at a minimum bi-monthly)**Describe the activities/work you have completed since the last time you reported.**

I have met on a bi-weekly basis with two colleagues to discuss my study and the related literature. We are in the process of writing the study up for publication and hope to have an article ready to submit by the end of spring semester.

What successes have you experienced with your work/project?

Since my last report in May 2006 I have had data loaded and have started to analyze it. I have also joined together with colleagues to examine the data and the related literature and to write the findings of the study. The success is that I am making progress on this phase of the study.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

Time has been my biggest challenge. It has been difficult to move this study along to completion as quickly as I would have liked. However, working on a regular basis with UMD Bush Grant colleagues has been very helpful.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

I am still analyzing the results from the study. This fall semester I taught one section of the course and decided to use the webx weekly reflection format based on some of the feedback I received from students who used the webx format last semester.

How are you using collaboration within your project?

As previously stated, I am working bi-weekly with colleagues on analyzing my data and producing an article for publication.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

The study involved an experimental design which is a scholarly process. This project also included a literature review. I have given one presentation on the UMD Campus about this study and I am in the process of working with colleagues to write an article about the study that will be submitted for publication.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: UMD

Faculty Member(s)/Instructor: David J. Doorn

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.):

Course Impacted by Research (e.g., Theatre History TH 3171): ECON 2030 – Applied Statistics for Business and Economics

Course Description: *(Please provide the course overview that appears in course bulletins)*

ECON 2030	- Applied Statistics for Business and Economics
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Introduction to modern business statistics, emphasizing problem solving through statistical decision making using case studies. Topics include organization and presentation of data, summary statistics, probability theory, distributions, statistical inference including estimation, hypothesis testing, introduction to regression and correlation, introduction to use of computers in statistical analysis.

Student Learning/Teaching Issue/Research Question:

In my Business Statistics course I have been concerned that, while students do tend to master the mechanics of calculating inferential statistics, they do not have a real understanding of it in general. I believe that increasing the active participation of students while in class can greatly improve their understanding of the subject matter. In addition, improving assessment of learning will help me in gauging my own success as a teacher and will, in turn, help the students when I make changes based on that assessment that improve the course.
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Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

I will introduce the use of concept mapping into this course. Concept mapping is a method by which the various concepts taught throughout a course are integrated through the use of key words and symbols in a graphical format. By making the links explicit, it aids in student's understanding of the overall course content.

The use of concept mapping as an ongoing and integral part of my course will help me to achieve the desired results with respect to both of the issues mentioned above. Having the students develop and add to the maps as the course goes on will require their direct involvement and interaction with each other. In addition, it will give me an ongoing assessment tool that will allow me to gauge student understanding as each topic is covered and for the course as a whole.
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Introductory Statistics is the ideal type of course for implementing such a learning tool. The course typically is designed to develop the groundwork for inferential statistics right from the start, with each concept covered building upon the last toward that end.
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Evaluation Plan:

In addition to collecting and evaluating the concept maps developed by students, assessment of learning outcomes is to be done through the use of pre-tests and post-tests of understanding of statistical concepts. I will also track changes in student's study habits over the semester through additional surveys.

Assessment of the results will be done using surveys, both at the beginning of the course and then again at the end. The surveys are in two parts:

- **GAMES Survey Instrument** – intended to indicate student learning styles and study methods and track how those may change over the semester. This portion is not course or content specific.
- **Statistics Concept Inventory** – to assess the impact of alternative teaching and learning strategies on the understanding of core concepts in statistics.

Summary of Outcomes:

The results were rather disappointing, showing little evidence of impact from the introduction of concept mapping on learning outcomes. There was some evidence of improvement in study skills, but nothing powerful. There is more data analysis to be done and we now have additional data to work with from another semester's class.

Please see the current working paper for more details on the results.

Reflection Log/Status: (To be updated at a minimum bi-monthly)**Describe the activities/work you have completed since the last time you reported.**

Since my last report the collected data has been compiled and analyzed. In addition, the results have been written up and presented at two academic conferences, a Bush Grant meeting, and a faculty colloquium. The academic conferences were:

- The Joint Statistical Meetings of the American Statistical Association, Section on Statistics Education, Seattle, WA, August 8, 2006
- Southern Economic Association Annual Meeting, Charleston, SC, November 18-21, 2006

The faculty colloquium took place at UMD on November 29, 2006. I was one of three grantees presenting their work.

What successes have you experienced with your work/project?

The work was well received at all of the above listed presentations.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

The outcomes were not as expected. I had hoped for more concrete results showing the effectiveness of concept mapping in the classroom. Also, results on the post-test were generally poorer than expected regardless of the experiment carried out.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

There are plans for implementing the mapping exercises more thoroughly into the class in the future, including having students complete their own maps and add to them as the semester goes on. My co-author has implemented this a little bit this past semester and we are currently tabulating the results from pre and post tests. These can then be compared to previous results.

Also, next time I teach the course, which will be in Fall of 2007, the intention is to continue with modifications and improvements to the implementation

How are you using collaboration within your project?

The whole exercise required each student to actively participate with others and to contribute their own ideas to the group outcome. Four key elements of interactive learning were met in the following ways:

- Each group produced a single product, so we had output goal interdependence.
- Individual accountability came from each student being required to bring a list to class with them.
- Group accountability came from each group having to present their results to the whole class.
- Each group member brought their own list of ideas to the table, which were presented individually to their group.
- All members participated in putting together the maps. The paper was large enough so that more than one person could draw at a time, so several students in each group were simultaneously working on the project.

In addition, I am collaborating with Maureen O'Brien in implementing and furthering the study.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

See above list of presentations and also the current draft of our working paper, which we intend to submit for publication by the end of the year.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: UMD

Faculty Member(s)/Instructor: Marshall Hampton

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 1

Course Impacted by Research (e.g., Theatre History TH 3171): Primarily Math 3280, Differential Equations and Linear Algebra. Some impact on Math 3298, Calculus III.

Course Description: *(Please provide the course overview that appears in course bulletins)*

MATH	3280	- Differential	Equations	with	Linear	Algebra
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(4.0 cr; Prereq-A grade of at least C- in 1297 or 1597; A-F or Aud, fall, spring, summer, every year)
First, second, and higher order equations; series methods; Laplace transforms; systems; software; modeling applications; introduction to vectors; matrix algebra, eigenvalues.

Student Learning/Teaching Issue/Research Question:

Can in-class small group work be effective in teaching upper-level mathematics? Is it more effective than only lecturing? How can I use group work and worksheets most effectively?

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

To explore the use of worksheets in my Math 3280 course, I am writing and using a new worksheet for almost every day in class. Since I have not done this before, I am starting conservatively and focusing on simple worksheets for groups of 1-4 students. I use approximately 1/3 of the class time for these worksheets.

Evaluation Plan:

So far I am relying on student surveys and a comparing this course to my previous experience, as well as my normal testing and evaluation of the students work.

Summary of Outcomes:

One clearly positive outcome is that I obtain feedback on the students' understanding of the material every day. In surveys, I have obtained overwhelming (almost 100%) support for the use of the worksheets, so it is at least clear that the students think they are effective. The class is relatively long for a math course (75 minutes per session), and so I take it as a measure of success when the students stay after class to continue working on a worksheet. In comparison to past courses, I am maintaining approximately the same pace covering the material, so the in-class time spent on worksheets has not impinged on the content. Overall I feel that this project is succeeding in improving the students' learning.

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

In addition to writing worksheets for the second half of the semester, I have surveyed my students twice more since my last report. I have not completely analyzed the results yet. I have also begun to reflect on how to improve my worksheets for the next time I teach Math 3280, and how I might incorporate similar material into my other classes.

What successes have you experienced with your work/project?

In a recent survey, 100% of the class said that the use of worksheets had been at least somewhat helpful; most responses were extremely positive. Using the worksheets took up over 1/3 of the total class time, but I was able to cover about 90-95% of what I did last year in a normal (all lecture) course. I believe they learned what was covered significantly better than they would have in an all-lecture course, so I think it was a success.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

For scheduling reasons, my students are not as strong mathematically as those I have taught in the past. This makes comparisons difficult. It also resulted in my worksheets being too difficult for the first few weeks of the semester, but I believe I have corrected that problem. Some of my students are also extremely resistant to working in small groups; this has proven to be such a problem that I have let some of them work by themselves.

I also have trouble evaluating how well the students learned because of the high variance in ability year to year, and my small class sizes (about 20 students).

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

I have made my worksheets easier and more directly connected to the basic skills needed to succeed in the course. In response to favorable assessments from students I have increased the use of worksheets.

I have also tried to coordinate the last example I do in class with the problem on the worksheet, so that the students have a template to follow on the blackboard. This helps the weaker students a great deal. These problems are usually chosen to be very similar to the homework, so they have a chance to do homework-like problems in a supportive environment.

How are you using collaboration within your project?

I am not directly collaborating with anyone, but I benefit a great deal from hearing about the experiences and ideas of other Bush faculty.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

I have read several related texts to begin to learn how to better assess the outcomes of my project, and to get more ideas on improving my teaching for the course. Since I am in the early stages of this project, I have no immediate plans on publishing an article or presenting my work, but I expect to at least make a presentation on my project eventually.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: University of Minnesota Duluth

Faculty Member(s)/Instructor: Charlene Harkins

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 1

Course Impacted by Research (e.g., Theatre History TH 3171): Hlth1470 Human Nutrition

Course Description: *(Please provide the course overview that appears in course bulletins)*

Course Description: (3 credits; 3 hr lecture) A study of human nutrition with emphasis on the science of nutrition, the nature of nutrients, processing of nutrients in the body, and nutritional aspects of human physiology.

Liberal Education Requirements: This course meets Category 5: Physical & Biological Sciences without a lab.

Student Learning/Teaching Issue/Research Question:

Does the use of a personal response system in a large lecture class increase student learning outcomes? Can the use of personal response systems accommodate different learning styles? Does the use of a personal response system increase instructor effectiveness?

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

Current study: to determine what particular tools help students in large lecture classes to learn the course material and be able to apply what they have learned. Does the use of a personal response system (clicker), online interactive practice questions, or TA study sessions help students? Which of these makes the biggest difference as evidenced by performance on exams?

Evaluation Plan:

Plant key questions/applications in classroom lectures using the PRS system. Plant other key questions/applications in online interactive format. Log students who choose to use TA study sessions. Determine which intervention (PRS, online interaction, or TA assistance) made the most difference in student outcomes as evidenced by scores on specific exam questions and the overall exam score.

Summary of Outcomes:

The data gathering and analysis involves two phases. The first phase has gathered data (for one exam) being entered into SPSS 14. This data includes: student attendance at TA study sessions, use of an interactive study guide, participation in the classroom with a prs clicker, and performance on three key exam questions and the exam score. An attempt was made to try to help students perform at a higher level on Bloom's Taxonomy (i.e. analysis or application rather than at a lower level of simply knowledge). This phase of data entry is currently in progress.

The second phase was a survey that was administered to two large lecture Human Nutrition classes on Nov 1, the class period after the exam under study. The results are as follows:

HIth 1470 SURVEY Nov 1, 2006

1) My score on Exam 3 is about what I expected.

		Sec 1	Sec 2
Strongly Agree	11	25	
Agree		48	65
Neutral		21	50
Disagree		33	66
Strongly Disagree		<u>6</u>	<u>21</u>
Total responses	119	224	

2) The online lecture study guides helped me to study for this exam.

Strongly Agree	33	68	
Agree		52	73
Neutral		19	32
Disagree		8	11
Strongly Disagree		3	7
What are lecture study guides?	<u>10</u>	<u>29</u>	
Total responses	125	220	

3) The clicker questions presented during class helped me study for this exam.

Strongly Agree	9	28	
Agree		42	56
Neutral		43	73
Disagree		18	46
Strongly Disagree		<u>11</u>	<u>18</u>
Total responses	123	221	

4. The Interactive Study Guide helped me to study for this exam.

Strongly Agree	43	94	
Agree		49	66
Neutral		12	24
Disagree		6	5
Strongly Disagree		3	1
I did not use the Interactive Study Guides		<u>14</u>	<u>25</u>
Total responses	127	215	

5. The Study Sessions with the TAs helped me to study for this exam.

Strongly Agree	49	74	
Agree		10	15
Neutral		0	8
Disagree		4	3

Strongly Disagree		1	3
I did not attend TA study sessions		<u>59</u>	<u>115</u>
Total responses	123		218
6. Studying for the last exam was most helped by			
Online lecture notes		14	39
Clicker questions		1	2
Interactive study guides	45		82
TA study sessions		55	66
None of the above		<u>11</u>	<u>31</u>
Total responses	126		220
7. What do you think of the clicker as a learning tool for this class?			
Strongly like		13	29
Like		37	63
Undecided		35	52
Dislike		21	34
Strongly dislike	<u>21</u>		<u>43</u>
Total responses	127		221
8. Participation with the clicker is part of the course grade this semester. Is this			
Helping a lot		26	95
Helping a little		62	73
No effect really	25		30
Negatively affecting my grade	<u>16</u>		<u>24</u>
Total responses	128		224
The results of the data analysis (Phase 1) will be compared to the results of this survey (Phase 2) to answer the question what helps students to think at a higher level on Bloom's taxonomy and do well on an exam? And do clickers in the classroom help to inform learning?			

Reflection Log/Status: (To be updated at a minimum bi-monthly)

Describe the activities/work you have completed since the last time you reported.

Attended Bush Grant meetings including: four meetings of the whole group, four small group interest meetings for the "clicker" group and three meetings for the large lecture group. I also attend the Bush Grant Colloquium III on November 29, 2006.

The "clicker group" has been working with LeAnn Rutherford from IDS to develop questions that will assess at a higher level on Bloom's Taxonomy. I have used these questions in the classroom and in exams. This group is working to put forward a proposal to present a workshop at the Academy of Distinguished Teachers scheduled for April 23, 2007. We also plan to present our workshop to the UMD community as an IDS presentation on March 29, 2007.

The large lecture group has had each individual member presenting their syllabi and discussing strategies for success in the large lecture situation.

I have done data gathering to assess what helped students in studying and preparing for Exam 3 of the Human Nutrition course. (some results noted above)

What successes have you experienced with your work/project?

Collaboration with other faculty. The most meaningful part of this experience has been the opportunity to meet, discuss and work with other faculty across this campus. All though we are all in different disciplines, many of our challenges are the same.

I have also gathered data that I am now in the process of analyzing. This should help inform how I should structure the large lecture Human Nutrition course for Spring Semester 2007.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

One of my personal challenges has been time to see this project through. I had hoped that being involved with the Bush Grant and this research would be recognized as additional service by my academic unit. I had hoped for some adjustment in my load (as a contract faculty member in CEHSP, my load is 90% teaching and 10% service, with a requirement to teach up 30 credits each academic year). I have been told that my research is not recognized as part of my load because it is not required for my faculty rank.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

I have worked to include more questions in the classroom (clickers) and on exams that are at a higher level on Bloom's Taxonomy. This means developing questions that involve more in-depth thought and application of principles as opposed to primarily (short term) knowledge based.

How are you using collaboration within your project?

I am part of two dynamic small groups who insights have helped me greatly. These groups include the "Clicker" group and the Large Lecture group.
Working with LeAnn Rutherford from IDS (clicker group) has been so helpful and invaluable!!

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

I have preliminary results to present. I have discussed this with the clicker small group and these will make up part of the workshop we are working to present.
I would like to work on an article.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: Duluth

Faculty Member(s)/Instructor: Jill D. Jenson

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): Four Graduate Instructors observed the course but were not actively involved in the study. They did, however, use the reflection sheets used for the study in their own courses (each of the four teaches one section of Comp 1120).

Course Impacted by Research (e.g., Theatre History TH 3171) Composition Comp 1120: College Writing (i.e., freshman comp)

Course Description: *(Please provide the course overview that appears in course bulletins)*

Instruction and practice in writing argumentative prose for academic situations with integrated work processing lab.

Student Learning/Teaching Issue/Research Question:

The issue I am studying is how to help students reflect more intentionally and more thoughtfully on what they learned, particularly in terms of writing reflection statements to accompany work uploaded into their electronic portfolios. My research seeks to answer these questions:

1. Will students write higher quality reflection statements regarding their work for Comp 1120 after answering straight-forward survey questions about their writing process than students who did not respond to such surveys?
2. Will students independently change the process they use for completing a writing assignment by identifying what that process was as well as what did and did not work well for them in using that process?
3. Will students make connections (in their reflective statements) between the writing they do for a first-year writing course and the writing they anticipate doing in other college courses by reflecting on specific lessons learned in completing a particular assignment?
4. Will students make connections (in their reflective statements) between the writing they do for a first-year writing course and the writing they may do beyond college by reflecting on specific lessons learned in completing a particular assignment?

Description of Research Project/Interventions/Methodology: (Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)

At several points during the semester, students are filling out a survey after writing a paper but prior to getting it returned with a grade on it. They answer questions such as these: What was the most important goal you had for this assignment? In preparing to write this paper, how much of the assigned reading did you do? How did you approach completing the draft you brought for peer review? They also complete questions that deal with the extent to which they revised the paper, the extent to which they had been reading the teacher's as well as a peer's comments on the paper, the effort put into getting questions answered prior to submitting the paper, and the number of points (i.e., the grade) they predicted they would get on the paper. After they receive the graded papers, they are asked to write about what they learned in terms of the assigned material, what they learned about the process they each used to complete the assignment, and what they might keep or change in that process when completing future writing assignments.

Evaluation Plan:

My plan for evaluating the project (if that is the "Evaluation Plan" being requested here) is to analyze the reflection statements (as typed into the portfolio) of the group of students who completed the survey instruments, comparing them with reflection statements written by students prior to the time the surveys were used. I plan to do a qualitative assessment of the content of the comments as well as a quantitative assessment of the length of the statements. In addition, I will analyze the reflection comments that were handwritten on the back of the survey instrument after the assignment was graded and returned to them. At this point I have analyzed one semester's work (from fall 2005) and am in the process of gathering data with a second group of students (from fall 2006).

Summary of Outcomes:

Example: Student survey data revealed . . .

At this point I have conducted a more thorough analysis of the data than at my last reporting. The analysis appears to show that:

- Most students (70% or more) over estimate the grade they believe they will receive on any given assignment by, on average, a full letter grade.
- Over 60% of students believe they revise their papers "thoroughly" and three-fourths say they pay a "great deal" of attention their peer reviewers' as well as my comments on their papers.
- The number of students who reported having questions they needed to have answered outside of class fluctuated, from 29% at the beginning of the semester to 61% at the mid-point to 45% at the end; however, they consistently reported that the place they most commonly seek answers to their questions is from their classmates (two-thirds go to a peer for answers)
- Students' reflection statements often identified problems in their writing process as well as steps they could take to correct these problems. This heightened level of awareness was also reflected in their electronic portfolios.

In addition, the comparison between reflection statements written prior to the time that the surveys were used and those written after that time show that the later statements are greatly improved.

Reflection Log/Status: (To be updated at a minimum bi-monthly)**Reflection for December 15, 2006****Describe the activities/work you have completed since the last time you reported.**

Since the last reporting on October 15, 2006, I have attended all scheduled meetings of the large group of Bush Grant participants as well as a small group meeting with Richard Holloway, consultant from MGT of America, Inc. In addition, I attended the third colloquium of presentations to the campus by Bush group participants on November 29. I also presented my findings on reflection to a small group of faculty from the Twin Cities campus (LeeAnn Melin, June Nobbe, and Grant Clavelle) who were here to work on Portfolio. Finally, the process of data collection that I used last fall continues in my current section of Comp 1120. Of the 20 students completing the survey on the day it asked for permission to use the results, all but two granted that permission. I plan to build on the information I have already gathered by making comparisons between the two groups of students who agreed to participate in the study last fall and this fall.

What successes have you experienced with your work/project?

The most satisfying successes remain the same as for the last reporting period, so I include them again here. The most satisfying success I've experienced was, by far, the Vancouver conference. I had no idea how hungry other electronic portfolio users are to hear about successes in learning that occur through using the tool. In fact, it was because of that experience that I decided to alter my time line for writing the article based on this research. I had originally planned to collect data again this fall (2006) before writing anything. However, after my presentation, I had requests for the information from faculty at Stanford and Berkeley as well as from overseas, with the requests coming from Great Britain and Amsterdam. Moreover, wherever I went as I attended the conference, participants—some who had not even attended my session—stopped me to ask about this project and what I've learned from it. This reaction was both overwhelming and totally unexpected. I think that because so much of electronic portfolio use is centered on the technical aspects of designing the tool and writing the code, faculty members, in particular, are eager to hear about how portfolio can be used to improve learning. As this was the focus of my project, I reaped the benefit of having a captive audience at my presentation as well as having several excellent conversations following it. This success led to the progress I have made on drafting an article for publication based on the research. While progress has been slow, I have about 15 pages written, which I believe is about two-thirds of the article. I am eager to finish writing and get some feedback from fellow cohort members on the draft before I start sending it out for review. Finally, the most satisfying success of the project has been that my students from last fall (2005) truly did write significantly better reflective statements than students in past sections of freshman composition. Many students were far more focused on their learning than on just getting a grade, and many were able to relate what we did in class not only to other college courses but to skills they realize will be important as contributing members of society.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

My response to this question seems to always be the same. The biggest challenge continues to be lack of time to devote to the project and simply the low number of opportunities I have to teach the course on which the project is focused. Furthermore, my administrative position as department head of one of the largest departments on campus allows little time to concentrate on the writing aspect of the project. I work on it as I am able and appreciate that the cohort meets on a regular basis. I need the group's support and infusion of fresh ideas to keep moving forward on the project. Another challenge I experienced this semester in particular was that the freshman students I currently have seem to lack motivation of any kind. Fewer than 10% of the students seemed to be truly interested in the course or their own success. While this is typical for a required freshman comp course, the challenges seemed to be greater this term. As I grow older and freshman students remain the same age, I am struggling with how to reach them. I would like to see future funding directed toward teaching and learning address this issue.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

Although I had thought I would change the questions I asked on the surveys this fall, after seeing that they actually worked quite well, I decided to leave most of them as they were on the original surveys I used. I am working on trying to help students in the course make better decisions based on their own reflections and the outcomes they claim to want from the course. However, I have found my current group of students particularly resistant to taking responsibility for their learning. To overcome this obstacle, I tried use more frequent versions of Angelo and Cross's *Classroom Assessment Techniques* (CATs) to determine what was creating this resistance. One consistent response from students was what their perception that they did not have time to do things like see a tutor or get help with their papers. I'm not sure how to deal with that issue, but I believe it's linked to the lack of motivation I mentioned above.

How are you using collaboration within your project?

As noted above, the cohort meetings continue to be valuable. I have also talked about my findings with other faculty who are heavily involved with electronic portfolio use on our campus as well as members of my department. Some of the graduate instructors who "shadow" my section of freshman composition have also decided to use the survey tool and the methods for improving reflection that I have employed, which creates opportunities for discussion with a group of people who are new to teaching and have fresh insights.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

I have done three presentations on my project, two locally and one internationally. I am also in the process of writing an article based on my findings. Beginning the drafting process also forced me to return to many of the articles I had previously read on this topic. This was very helpful in focusing my writing and determining what still needed to be said on the topic. My hope is to work more on the draft of the article during the January break.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: Duluth

Faculty Member(s)/Instructor: Joseph Johnson

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 1

Course Impacted by Research (e.g., Theatre History TH 3171): Chem 4341, Chem 4351; Phar 6151

Course Description: (Please provide the course overview that appears in course bulletins)

Biochemistry - Introduction to structural classes of biologically relevant molecules. Descriptions of monomeric small molecules and their incorporation into macromolecules. Covers amino acids, proteins, fatty acids, lipids, sterols, carbohydrates, nucleic acids, RNA, and DNA structures.

Student Learning/Teaching Issue/Research Question:

I am addressing multiple issues in my research. The first is the use of personal response systems ("Clickers") to evaluate the comprehension of the students during lecture. The second issue is to help the students develop critical thinking abilities and to critically assess their own understanding and take responsibility for areas of deficiency.

Description of Research Project/Interventions/Methodology: (Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)

This semester I continued the use of the personal response systems. I administered post exam surveys for the first two exams via TestPilot. Included in these surveys were questions regarding the usefulness of clickers. The post exam surveys also probed the students' perceived preparedness and performance. I ceased giving the post exam surveys once I sensed that they were negatively influencing course instruction.

Evaluation Plan:

I plan to analyze the data and evaluate how well the students assessed their performance for both Spring and the first part of Fall 2006 semesters. I need to devise a way to gather student data while minimizing my influence on the data.

Summary of Outcomes:

Example: Student survey data revealed . . .

Most of the data collected has not yet been analyzed.

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

I concluded the Spring 2006 semester by administering a learning styles preference assessment. I have not had time to analyze the data. I did compile some of the clicker question data for a poster presentation at the Great Lakes Regional Meeting of the American Chemical Society. This was presented in a poster with Bilin Tsai and Don Poe, both of whom are Chemistry faculty.

What successes have you experienced with your work/project?

As initially mentioned in the last course profile, this project has at least made me more reflective/aware of how I approach teaching and of my effectiveness at delivering the material. This has continued during this past semester.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

My greatest challenge at the moment is devising a way to probe the self-regulation of the student learning without adversely affecting the experimental setup and data that I am trying to collect.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

I was able to utilize more effective clicker questions this semester and use them to drive course instruction/discussion. I have yet to make further adjustments that are likely to be found in the unanalyzed data.

How are you using collaboration within your project?

My colleagues that are also using the personal response systems met biweekly over the semester. The discussion focused on how to develop more effective clicker questions. Particularly using Bloom's taxonomy in the generation of questions that probe different levels of the students' understanding. We also met as science instructors once to discuss issues related to teaching science.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

Some of my clicker data was presented at the Regional ACS meeting over the summer. The members of the personal response system group are planning to present a workshop presenting suggestions and examples of more effective clicker questions employing Bloom's Taxonomy.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2- Dec 2006**

Campus: UMD

Faculty Member(s)/Instructor: Dr. John Kowalczyk

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 1

Course Impacted by Research Health and Wellness HLTH 1100 (2 sections)

Course Description: *(Please provide the course overview that appears in course bulletins)*

HLTH 1100 Health & Wellness- Strategies for Life

Lecture series introducing students to health and wellness encompassing nutritional, physical, emotional and spiritual aspects of health and well being with an emphasis on behavioral, environmental and social influences on developing a satisfying and productive lifestyle in our society.

Student Learning/Teaching Issue/Research Question:

Getting students more engaged in critical thinking exercises in class and not be lecture driven

Getting students more reflective in their writing about behavioral modification improvements.

Raising consciousness level of students to higher level of thinking

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

I started this semester by posing "clicker" questions for feedback on clicker technology being useful- one notable strength and one notable weakness; did clicker technology enhance attendance and learning in the class

I decided on how I will implement the research questions to the HLTH 1100 class this semester and again for Spring 2007. I conducted the survey instrument in December 2006.

Evaluation Plan:

I have developed questions to be included in the fall research project;

I will be developing the critical thinking scenarios for the fall and working through how I will generate more reflective exercises in the class

Summary of Outcomes:

Example: Student survey data revealed . . .

I have just collected my first set of data from both of my HLTH 1100 classes this past week. I have not analyzed the data yet.

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

See Evaluation plan above.

What successes have you experienced with your work/project?

N/A

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

Still thinking through other Bush Grant cohort ideas to help me get a stronger sense and picture of what I will be focusing on . I feel more ready now, but I am teaching 7 courses and it is very demanding of my time. I have not been able to focus on the Bush Project as much as I would like.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

Looking at data now from this semester's clicker questions posed on technology enhancement which I will then use to develop the research component for the spring 2007 semester.

How are you using collaboration within your project?

Attending meetings to hear what other Cohort faculty are doing.

Meeting with small group- Clicker Group facilitated by Chad Pierson

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

Will be developing after the fall semester 2006. I am collaborating with Char Harkins, Chad Pierson, and LeAne Rutherford on a proposal to speak at the UM Teaching Conference for April 2007.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: University of Minnesota Duluth

Faculty Member(s)/Instructor: Duane Millslagle

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.):

Course Impacted by Research (e.g., Theatre History TH 3171):

Course Description: *(Please provide the course overview that appears in course bulletins)*

Online and face-to-face courses in psychological aspects of coaching course CC 3160 at the undergraduate level.

Student Learning/Teaching Issue/Research Question:

Examine Meta-cognitive Strategies of Self-Regulation in Undergraduate Students.

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

The purposes of this study were: 1) to identify what meta-cognitive learning strategies were used by undergraduate students, and 2) to investigate differences among the meta-cognitive learning strategies between successful and unsuccessful students across courses delivered face-to-face and online

Subjects: A total of 148 undergraduate students enrolled in a psychological aspects of coaching course across a three-year period were participants in this study. In the first year, 57 undergraduate students participated in an activity that identified what metacognitive learning strategies made them successful or unsuccessful in the course. During second and third years, the study involved 53 students in two face-to-face sections of the course, and 38 students in two online WebCT sections of the course. The students voluntarily participated in the study and were provided extra credit for completing the activities and/or inventory about their meta-cognitive learning strategies. The students were earning a bachelor's degree in a variety of majors and/or were taking the course to complete a coaching minor.

Procedure: The learning module content, grading criteria, methods of evaluation, and course materials were similar between the face-to-face and on-line courses. The course resources included the text, instructor notes, and power point presentations. The two online courses were delivered through WebCT.

Permission from the Human Subjects Committee was obtained prior to data collection. The students completed the course expectation part of the survey during the first learning module of the course, and the 20-question meta-cognitive learning strategy survey was completed after the last learning module of the course.

Evaluation Plan:

Survey Instruments

The data collection instrument used to identify what meta-cognitive learning strategies were used by the students in the course during the first year included two open-ended questions: 1) What strategies do you use that make you successful in earning high grades? and 2) What strategies do you use that make you unsuccessful in earning high grades? Following the data collection, the investigator classified the responses into meaningful categories using a content analysis process in which words or phrases used by the students were grouped into minor categories, which were subsequently grouped into major categories. By grouping the students' responses, four major metacognitive strategies emerged: record keeping, planning and goal setting, seeking information, and environmental structuring.

A two-part learning strategy instrument was developed to assess each meta-cognitive strategy. Part one assessed each student's expected final grade in the course. The expected final grade was used to identify the successful and unsuccessful students in the study and within each type of delivered courses.

The operational definition of a successful or unsuccessful student in the study was dependent on the student's expected course final grade stated at the beginning of the class and the actual final grade. If the student's initial grade expectation matched their actual final grade or their final grade was higher than their initial grade expectation he/she was classified as a successful student. If the student's initial grade expectation was higher than the actual final grade, he/she was classified as an unsuccessful student. During the second and third year, 49 students were classified as successful, including 27 students in the face-to-face courses and 22 students in the online courses. Forty-two students were classified unsuccessful, including 26 in the face-to-face courses and 16 in the online courses.

The second part of the survey included 20 ranking, listing, and open-ended questions about the meta-cognitive strategies of interest in this study. Two identical versions of the survey were developed; a pencil-paper instrument used in the face-to-face courses and an online version was developed using WebCT for the online courses.

Summary of Outcomes:

Analysis of results for each item on the meta-cognitive learning strategy survey depended upon the type of question. For the ranking and multiple choice questions, the results were obtained by tallying the students' choices and then summing the tallies. Due to the nominal nature of the data, the recommended method of analysis was to report the sum tallied scores for these questions and to calculate percentages (Pattern, 1998).

Content analysis, as described for the first-year survey above, was also used to translate responses to the open-ended questions on the meta-cognitive learning strategies survey.

Results & Discussion

Students identified four meta-cognitive strategies (record keeping, planning and goal setting, seeking information, and environmental structuring) used to achieve a higher grade in the course. Each meta-cognitive learning strategy of interest in this study will be discussed on the type of course delivery, face to face or online and type of student; successful and unsuccessful.

Record keeping

Types of courses. Notetaking is a record keeping meta-cognitive learning strategy that a learner uses to record the events of class or the resources of the course content; notes are later reviewed when preparing for a test. In the face-to-face courses, notetaking was the primary study strategy for the students. In the online courses, 65% of the students did not take notes. The form

of notetaking in the online course was using a highlighter to mark the important phrases or statements in the reading materials.

Type of student. The successful students reviewed the notes before reading the course materials, whereas the unsuccessful students memorized them before taking the tests. Both the successful and unsuccessful students used notetaking to clarify the reading materials required in the courses.

Notetaking, of course, was very evident in the face-to-face course, where material is presented verbally by the instructor; the material was recorded for later study. But in the online courses, more of the material was presented in written format and was accessible for longer periods of time for review by the students.

Information seeking

Type of course. Reading and the ability to understand what is read is a student-initiated, information seeking meta-cognitive learning strategy. Seventy-five percent of the students in the face-to-face course reported reading the assigned materials compared to 97% of the students in the online course. Students in the face-to-face course reported reading the materials after the lecture was given by the instructor. Students in both types of courses reported that they took frequent breaks and underlined key sentences and phrases while reading. The time required to read one chapter of the text differed between students in the face-to-face and online courses. In the face-to-face course the students took on an average of 1 hour to read the chapter where as the students in the online course took 1.5 hours. The students' perceived reading comprehension of the course reading materials associated with the chapters of the text and power point slides were lower in the face-to-face course (6.4 out of 10) then in the online course (7.5 out of 10).

These results indicate that the students in the face-to-face course were less likely to read the assigned reading materials and spent less time in reading the materials compared to the students taking the course online. These results suggest that reading of the material in the online course was a primary learning strategy to achieve a high grade in the course, and students who take online classes have a higher perceived level of reading comprehension than students who take face-to-face courses.

Type of student. Many similarities were found between the unsuccessful and successful students across the two types of course delivery. Successful students read the materials at least twice, underlined key phrases and terms while they read, and had a perceived reading comprehension rating of 8.5 out of 10. Unsuccessful students did not read the materials and had a perceived reading comprehension rating in the face-to-face course of 5.9 and in the online course of 6.3.

Students who take the online course may be drawn to taking these courses because they possess a higher level of ability to comprehend the reading material. The student's level of reading comprehension may be an important learning strategy in being successful in online courses. One major difference between the successful unsuccessful student was the successful student read the materials and unsuccessful student did not. One reason of this finding may be the unsuccessful student comprehension of the materials was perceived low. Having a perceived low reading comprehension may have affected their motivation to read the materials because it was affects

Planning and Goals Setting

Type of course. In the face-to-face courses, 26% of the students set daily or weekly study goals compared to 60% of the students in the online courses. In planning for the upcoming test, 62% of the students in the face-to-face course indicated taking good notes and reviewing the notes frequently were their primary goals while 55% of the students in the online course indicated that reading the course materials was their primarily goal. The primary planning strategy for the

students in both types of course delivery was setting aside time in their schedule to study. The students taking the online course set more frequent goals, and the goals related to information seeking learning strategies. The student in the face-to-face course set goals less frequently and the goals were related to the recording keeping learning strategy.

Type of student. Again, similarities were found among the unsuccessful and successful students between the two types of delivered courses with regard to goal setting and planning. The successful students in both types of course delivery set daily and weekly study goals whereas the unsuccessful students did not set goals. The primary planning strategy in the successful students was related to information seeking, that is, how they read the assigned materials. The primary planning strategy in the unsuccessful students was related to environmental structuring, that is, to set more time aside to study. It seems that the successful students' efforts in learning were directed to changing how they studied and unsuccessful students' efforts were directed to studying longer.

Environmental structuring

Type of course. The environmental structuring meta-cognitive learning strategy is a student-initiated effort to select or arrange the physical environment to make learning easier. This strategy was categorized in this study as the study habits of the students. In the face-to-face and online courses, the students studied at home in a quiet place with little distractions during the evening hours. The study time of both the unsuccessful and successful students in both types of the courses was reported the same; 8-10 hours per learning module.

Type of student. Few differences appeared between the successful and unsuccessful in study habits. They studied 8-10 hours per learning module at home, during the evening hours in a place with few distractions. Successful students in the face-to-face and online courses had a set study routine while the unsuccessful students did not have a set study routine.

Students' efforts to structure the learning environment to make learning easier are similar between courses and type of student. One interesting finding was that study time was not affected by type of course or type of student. This similarity in the duration of study suggests that the amount of study does not directly determine high achievement in the class, and based on the differences found in the learning strategies, successful students study differently than unsuccessful students within the same study time.

Conclusion and Implications

This study identified four meta-cognitive learning strategies that were important in achieving a higher grade in a course. Investigation of how the students used these strategies in face-to-face or online courses found similarity in the environmental structuring of the students, but found differences in their record keeping, information seeking, and goal setting and planning. The study identified differences between successful and unsuccessful students' use of meta-cognitive strategies with the exception of environmental structuring, but differences among the successful or unsuccessful students by type of delivery was not found.

These results support the contentions of Zimmerman (1998) that meta-cognitive strategies may be a reason for student success or failure in desired goal achievement. Zimmerman et. al., (1996) have provided a series of exercises that teachers could use to develop meta-cognitive strategies in their students. Though written for middle and high school teachers, these exercises could be modified for professors at the higher education level in any college course. The professor would have students self-evaluate and monitor study habits and strategies, and reflect on strengths and weaknesses of their approach to their study methods. Following this self-evaluation period, the teacher's role is to provide graded opportunities to gauge the implementation of new or modified learning

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

Compiled the results of both face-to-face and online courses then developed a power point presentation of the findings. Secondly, I submitted a research proposal to a national conference. Thirdly, wrote an article about the my results.

What successes have you experienced with your work/project?

The project can best be summarized as my effort to understand why some students are successful and other students are not. I realize that my teaching in face-to-face course may be more content oriented than process. Online teaching environment engages the student more in the study of the subject area. Successful students have common learning strategies that they use in both on-line and face-to-face courses. Unsuccessful student learning strategies may be a determinate in why they are not successful.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

The time it takes to analyze the data and having the students give 100% effort in completing the surveys were the challenges.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

The project in the beginning was in the study meta-cognitive strategies of students enrolled in face-to-face courses and then in the second year I extended it to online courses.

How are you using collaboration within your project?***How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)***

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: Duluth

Faculty Member(s)/Instructor: Chad Pierson

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): One

Course Impacted by Research : Math 1250-Precalculus Analysis

Course Description: *(Please provide the course overview that appears in course bulletins)*

Credits: 4

Liberal Education Category:

CATEGORY TWO: Math, Logic, and Critical Thinking

This course introduces students to mathematical topics essential for their functioning in contemporary society, with its ever-increasing demands on its members for understanding and interpreting technical information. The course includes the analysis of graphical data, comprehension of functional relationships, growth rates, and elementary concepts of probability. Furthermore, the course is designed to improve those algebraic and computational skills necessary for the study of Calculus.

Course Description:

This course introduces the concepts of inequalities, analytical geometry, relations, functions, and graphs. It includes exponential, logarithmic, and trigonometric functions along with complex numbers. It also covers De Moivre's Theorem, permutations, combinations, binomial theorem, and mathematical induction.

Student Learning/Teaching Issue/Research Question:

How does a Technology enhanced course affect student learning?

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

Use of a personal response system in lectures with content related questions to gauge student learning.

Use of online homework as a tool to facilitate self paced student learning.

Evaluation Plan:

Personal response quizzes are administered daily involving both review questions from the previous day's lesson and current day's course material. Personal response system provides immediate feedback to both instructor and student with assessment of learning and/or teaching. Results can be compared with exam results for the same content.

Using online homework that is packaged with the text as an assessment tool in part as replacement for hand in homework.

Summary of Outcomes:

Based on survey questions students perceive a benefit from the personal response systems both to their own learning and my teaching.

Initial responses indicate that students feel strongly that online homework helps students learn and review at their own pace and the instantaneous feedback helps with retention of material.

Reflection Log/Status: (To be updated at a minimum bi-monthly)**Describe the activities/work you have completed since the last time you reported.**

I have asked my two lecture sections different content questions using PRS and am in the process of evaluating the performance on the most recent exam as it relates to the specific content asked in class.

I have surveyed the students regarding the technology used in the course. Both in regards to the PRS and the online homework.

What successes have you experienced with your work/project?

Through survey data a majority of students continue to perceive a benefit from the daily assessment. Overall attendance has improved since the personal response system was introduced to the course. Initially online homework seems to have resulted in improved scores for the regular homework. Students have commented to me on the value of the online homework and its value in assisting learning.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

The technology has a steep learning curve and students are sometime impatient with bugs that inevitably transpire. This is very apparent whenever a new version of whatever software that supports the technology is released. I have a hard time selling the extra effort as a benefit to the students when they experience roadblocks unrelated to the material in the course.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

I haven't made any adjustments recently.

How are you using collaboration within your project?

I am collaborating with other faculty in two small group discussions. One is related to teaching large lectures. We have shared methods and which we have delivered our courses and learned from each others success and failures. The second evaluates issues related to personal response systems in the classroom. We are in the process of designing a workshop that will explore writing multiple choice questions that delve more deeply into course content and lead to a greater understanding.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

I am helping to prepare a workshop for faculty using PRS.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: UMD

Faculty Member(s)/Instructor: Helen Mongan-Rallis

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 1 (just me)

Course Impacted by Research (e.g., Theatre History TH 3171): Educ 7001

Course Description: *(Please provide the course overview that appears in course bulletins)*

This is an introductory course designed to guide students in the development of the technology and writing skills that they will need (a) throughout their M.Ed program (b) in the context of their professional practice and (c), for those students who wish to work toward NBPTS certification, for the development of their NBPTS portfolio.

This Educ 7001 course is designed to accompany the Educ 7008 class that is taken concurrently. Thus the learning activities and assignments from Educ 7001 are structured so that students immediately apply the skills learned in 7001 in their work for Educ 7008. These skills include: use of online communication tools such as email, threaded discussions, blogs, wikis, chat rooms, voice over Internet protocol (VOIP), and podcasts; informal writing in these online environments; formal academic writing in the development of a literature review; and using the Internet to locate and contribute to online resources.

Practice will be deeply informed by reflection, critical thinking and an ability to think analytically across interdisciplinary boundaries. Through reading about, using, and engaging in critical discourse about the use of technology and Internet based resources, students will apply these ideas and concepts to their professional and personal contexts.

Student Learning/Teaching Issue/Research Question:

- Purpose of my project is to find out which communication tools are most effective from students' perspective in:
 - Engaging students: level of interaction and connectedness to others; related to this, is sense of connection to a learning community
 - Promoting depth of reflection & understanding of issues
 - Motivating students to share their ideas
 - Ease of use & reliability

Description of Research Project/Interventions/Methodology: (Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)

Research question:

Which communication tools are most effective from students' perspective in:

- Engaging students: level of interaction and connectedness to others; related to this, is sense of connection to a learning community
- Promoting depth of reflection & understanding of issues
- Motivating students to share their ideas
- Ease of use & reliability

Methodology:

- Pre-assess students' knowledge of skill level using each tool prior to the start of the course
- Teach students how to use each tool
- Have students use the tools to share reflections on readings and to engage with each other (through using each tool) in discussing what they are learning
- Post- assess student skill level using each tool
- Survey students & have focus group to ask students which tool they thought was best in terms of (a) ease of use (b) engaging with each other (c) promoting depth of reflection (d) motivating them
- Analyze of blogs and transcripts of discussions, coding using the course rubric, to see which tools led to the highest level of depth of reflection and student engagement

Evaluation Plan:

- Pre-assess student skill level using each tool
- Post- assess student skill level using each tool
- Analysis of blogs and transcripts of discussions to see which tools led to the highest level of depth of reflection and student engagement

Summary of Outcomes:

Student pre-assessment survey data revealed the following:

Based on this pre-assessment survey and the results shown above, I revised the course so that I focused on teaching those skills in which the students rated themselves lowest and that they would need to use this first semester of their work in the M.Ed cohort. Specifically: wikis, blogs, and online class participation skills. Based on discussions with other faculty in the cohort and the students, I also spent some time teaching students how to use online research tools (Furl, RefWorks, Google Scholar, and using UMD online databases).

Analysis of student online work:

This is not complete at this time as students are still engaged in these. I have been collecting student statements about each of the tools and will be analyzing these in more details.

Next steps:

- Student self post-assessment (using same survey)
- My own refinements in:
 - how to teach the tools
 - written guidelines

providing examples which tool to use when

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

- Met face-to-face with some students (at an optional Saturday morning session) to have practice session on how use library and online research tools. I also taped this and created a DVD that I mailed to students who were not able to attend and who wanted to watch it.
- Posted detailed online guidelines for students' literature review project.
- Provided increased online help as students began their literature review and began asking questions about the various tools in our WebX discussion.

What successes have you experienced with your work/project?

- The pre-surveys were very valuable in enabling me to structure the course and my instruction based on the needs of the students.
- The blogs have been an unexpected asset to the course and to helping students engage in critical reflection.
- The student online "focus group" via WebX provided invaluable feedback as students reflected on their use of the different online tools

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

The wikis have not worked as well as I thought they might, but what I have learned about them from student feedback has been invaluable

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

- As noted above: The pre-surveys were very valuable in enabling me to structure the course and my instruction based on the needs of the students.

How are you using collaboration within your project?

Working with Lynn Bye and Shelley Smith on a group project looking at online teaching and learning.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

- I presented the details of my project to date and the Bush Colloquium on Nov. 29, 2006
- My choice of tools and my teaching with them comes out of my research last year on distance education at UMD. As part of this project I read numerous scholarly articles on best practices and uses of technology for online teaching.
- In our research project, Lynn Bye, Shelley Smith and I are in the process of reviewing literature pertinent to our project.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: Duluth

Faculty Member(s)/Instructor: Justin Rubin

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 1

Course Impacted by Research Music Theory I MU1101

Course Description: *(Please provide the course overview that appears in course bulletins)*

MU 1101: Study of basic diatonic material and structure with introduction to chromatic material. Analysis of vocal and instrumental scores; creative writing coordinated with ear training, sight singing, and elementary keyboard harmony.

Student Learning/Teaching Issue/Research Question:

My course of studying student learning has led me to a core question of students being engaged in, and inspired by, the material. I have turned towards the notion of finding ways of making the musical examples we study less abstract by working with full scores and pieces. Often in Music Theory, especially in the first year, we illustrate concepts through simple but not musically interesting examples. I am testing whether using concrete models from the masterworks literature, even from the outset, will bring greater interest to the discipline for the students. Also, this gives me the opportunity to flesh out the composer at hand in terms of historical importance, and giving details about their lives and times – thus hopefully making the music come alive. The key for me is to show how concepts can be applied in real works of art and then have students composer their own pieces using the same techniques.

Description of Research Project/Interventions/Methodology: (Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)

My methodology begins by presenting a musical concept in class through a series of score analyses that illustrate a specific technique, in this case the proper preparation and composition of a simple eight bar parallel period. I have chosen piano sonatas by Hadyn for these analyses that I can play in class myself and then talk about each work, the circumstances in which it was composed, something about the man and the music of the era, etc. This first-hand engaging technique is designed to get the students interested in the music first, and then curious as to how he can write such a work using the abstract theoretical techniques that need to be studied.

Next, I bring in my laptop and use music engraving software to create a 'group' example by calling out for musical ideas from the class, but guiding them very closely. Since the software can play our example back as we compose 'by committee' back to us, we can hear what will work and what needs improvement. I discuss in detail why I choose some suggestions over others and then we play the final work and compare it to the model pieces we analyzed earlier.

Finally I have the students write their own model pieces, asking them to give them interesting titles as the music dictates. Again, the idea is that if I can engage the students in an area of their study that often they aren't always prepared for when they become music majors, and show them that they can be creative and inspired in such an academic class, the retention of some students we may lose will be avoided.

Evaluation Plan:

I will work with students individually on their pieces once they have a draft in preparation for the final project to be handed in and graded. This allows the student to see where they are on the right track and where they need improvement without the daunting prospect of being graded immediately. I will play their pieces for them and that will allow them to use their innate musical intuition to know what is going well and I can guide them as to how to improve their work.

Summary of Outcomes:

So far, the students have just begun working individually on their final projects so the ultimate outcome is yet to be studied. However, I have noticed an increased level of interest in the students based on how many are asking about hearing more recordings of the kind of music I am playing in class. This shows real engagement and interest being instilled in the students as a whole and a critical development of their aesthetic understanding. The students also suggested many good ideas in the computer-aided group compositions and were happy with the outcome of the pieces.

Reflection Log/Status: (To be updated at a minimum bi-monthly)

Describe the activities/work you have completed since the last time you reported.

I have prepared a series of lectures and in-class performances of masterworks from the literature for piano from the Classical era. I made templates for the in-class computer aided compositions and provided the students with ample models for their final projects. I have spoken with students about how these projects have been effective and what I could do to greater elucidate the concepts in preparation for the final project.

What successes have you experienced with your work/project?

I have learned that students are eager to create in music, regardless if they have composed before or not, and this outlet is key to providing them the techniques they need to know to become better musicians. Regardless of the students' individual creative abilities in music, allowing them to understand music from the vantage point of composition rather than strict analysis and abstract concepts involves them at an early stage of their learning. It is a strategy that I wish to apply throughout my teaching.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

I hoped that more students would provide ideas for the in-class compositions, but some I think may feel intimidated or shy or unsure of their ideas.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

I have considered adding one step between the in-class computer aided models to the individual projects by first having small groups create a composition (4-5 student groups). I have also begun doing more aural analysis in class wherein we listen and try to discern the various techniques discussed in class rather than always rely on the written page. This is also an attempt to solidify the relationship between their theory and ear-training classes.

How are you using collaboration within your project?

Outside of students collaborating with one another, I am working with the other theory faculty on assessing student needs to bridge the gap between the freshman and junior level classes. I have redesigned the theory and aural skills curriculum and sought to streamline student learning to aid in the retention of students beyond the freshman year.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

None at this time.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: UMD

Faculty Member(s)/Instructor: LeAne H. Rutherford *and* Shelley Smith, Instructional Development Service

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): Bush Grant Cohorts 1 & 2 and subgroups therein

Course Impacted by Research Courses which are the subjects of the research/projects as well as courses taught by workshop participants who choose to follow suit.

Course Description: *(Please provide the course overview that appears in course bulletins)* Shelley and LeAne arranged, publicized, and facilitated the following workshop:

**IDS and the Bush Grant Faculty present:
Mirroring Practice and Preferences: Bush Colloquium III**

Do your students know

- How they can study to increase their learning?
- Their own learning styles / preferences?
- How to reflect on their own learning processes and be actively engaged in creating their own scholarly identities?

UMD faculty participating in the Bush Foundation Grant for *Enhancing Student Learning through Innovative Teaching and Technology Strategies* have been conducting research that provides a mirror that can be used to both assess student learning and help faculty modify their teaching practices in ways that will increase that learning. In other words, they want to help their students to be more independent learners by becoming more reflective practitioners themselves.



This colloquium showcases a new set of projects that mirror both practice and preference. Members from this second cohort are eager to report on the outcomes of their research and to provide you with ideas for innovative teaching and technology-assisted strategies that could enhance student learning in your own classrooms.

If inspired, you may consider joining the next tier of grant recipients yourself.

Moderator	Bilin Tsai	Chemistry and Biochemistry
Panelists	Colleen Belk	Biology
	Modeling Critical Thinking in the Lecture Hall and its Effect on Student Performance	
	David Doorn	Economics
	Assessing the Gains from Concept Mapping in Introductory Statistics	
	Helen Mongan-Rallis	Education

Learning, Using, and Reflecting on the Effectiveness of Online Communication Tools

Wednesday, November 29, 2006
3:00-4:30 p.m.
Kirby Student Center 268

To register for this session, contact Jason Ellis at jellis2@d.umn.edu or x6355.

The University of Minnesota is an equal opportunity educator and employer. Disability accommodations will be provided upon request. Call 726-6355 to make arrangements.

We look forward to seeing you there!

Student Learning/Teaching Issue/Research Question:

We continue to assist Bush participants in posing and refining their research questions.

To view a list of teaching and learning issues, please see the Fall, 2006 *Instructional Development* newsletter below.

Reflective Practitioners and Self-regulated Learners: Mirroring Practice and Preferences (A Report on UMD's Bush Foundation Grant Activities)

I came to see why I did so bad in the test. I really studied hard. I read my class notes and looked over the book. Guess I'll just have to study harder.

The Challenge

The definition of insanity is unsuccessfully doing the same thing over and over and expecting different results. Perhaps we might ask this student if studying differently might yield greater success.

But what if the student doesn't know how to study differently or why? In part, helping students to recognize their own strengths and preferences, to seek options, to suggest alternative strategies, and to learn how to study differently is what faculty participants have been doing in the current Bush Foundation Grant, Enhancing Student Learning through Innovative Teaching and Technology.

Probably every instructor's dream would be to have students who were aware of how they learn best and were able to apply that awareness to developing and personalizing tactics for learning. In turn, students may wish for more instructors who give thought to how their students learn and how they align their teaching practices with those insights. UMD faculty participating in this grant have been conducting research that provides a mirror for both assessing student learning and helping faculty modify their teaching practices in ways that will increase that learning and help their students to be more independent learners by becoming more reflective practitioners themselves.

To bring these dreams and hopes into line, twenty-one UMD faculty members were selected to be a part of this larger, four-campus initiative to improve learning through collaboration and then introduce their findings to their institutions. Led by Bilin Tsai, the campus coordinator for this grant, the following are currently participating:

Jim Allert, Computer Science
Colleen Belk, Biology
Lynn Bye, Social Work

David Doorn, Economics
 Marshall Hampton, Math/Stat
 Mark Harvey, Theater
 Charlene Harkins, Health, Physical Education, Recreation
 Jill Jenson, Composition
 Joe Johnson, Chemistry/Biochemistry
 John Kowalczyk, Health, Physical Education, Recreation
 Duane Millslagle, Health, Physical Education, Recreation HPER
 Helen Mongan-Rallis, Education
 Chad Pierson, Mathematics/Statistics
 Justin Rubin, Music
 LeAne Rutherford, Instructional Development Service
 Shelley Smith, Instructional Development Service
 Steven Vanderheiden, Political Science; Philosophy
 Janelle Wilson, Sociology/Anthropology

The Goals

The broad goals of all four U of M campuses include

- keeping **student learning** in the forefront
- fostering a **scholarly and collaborative approach** to addressing student learning
- integrating the assessment and evaluation of student learning initiatives into the **campus mainstream**.

More succinctly, the goal of this grant is for faculty members to improve student learning in ways that can be sustained, documented, duplicated in other courses, and assessed.

The Research Context

Under this aegis, the UMD focus has been on developing faculty members who are reflective of their teaching strategies and practices and students who can self-regulate their learning, i.e., self-motivated and reflective. D.R. Garrison, in "Self-Directed Learning: Toward a Comprehensive Model," defines self-directed learning "as an approach where learners are motivated to assume personal responsibility and collaborative control of the cognitive (self-monitoring) and contextual (self-management) processes in constructing and confirming meaningful and worthwhile learning outcomes." As one potential grant recipient stated, "Although I am not entirely certain what a reflective practitioner or a self-regulated learner is, (though I think that I'm the former and that I've not had many of the latter), I would be willing to learn, and to redesign my courses accordingly." Consequently, Bush grant faculty have been incorporating reflection and student self-regulation into their course design and measuring the impact of these strategies on student learning.

An overview of educational research revealed at least three significant conclusions that piqued the group's interest in self-regulated learners. First, Zimmerman and other scholars pointed out that most class settings emphasize disciplinary content. As a result, too little time is spent considering why, how, and what students learn and what teachers teach. The ultimate goal of a reflective process for instructors is to improve student learning through teaching them self-regulation through self-awareness.

Secondly, practitioners who train students in the use of learning strategies, such as goal setting and self-evaluation, attain higher standards of achievement in and across subjects and disciplines. Self-regulated learners, once trained, will use decision-making learning strategies to attain academic and performance goals. Finally, students acquire these learning strategies through training, and faculty should not assume that learners will develop them on their own (Zimmerman).

Garrison cites Mezirow in making a case for developing student awareness. He writes, "Becoming critically aware of what has been taken for granted about one's own learning is the key to self-directedness" (p. 19). Grant participants have been not only developing students'

awareness, but in a reciprocal response, developing a deeper understanding of learning issues and strategies for addressing them.

To balance the academic equation by looking at their own assumptions and practices as well as their students', grant participants have spent time reflecting, first, on what issues might drive their inquiry and, secondly, on whether the actions they took to solve the problem were, in fact, working. Examples of problems ranged from students' frequent inability

- to transfer processes between similar situations or to real-life applications
- to reflect on their learning
- to engage in constructing meaning or integrating old understanding with new
- to develop study skills and strategies for classes ranging from chemistry to calculus
- to see the relationship between attending class and achieving the benefits of participating in it
- to be aware of and take advantage of their learning preferences,

Classroom-based Research Projects at UMD

The current participants, including instructors from all five colleges, have been directing their gazes toward the following concerns:

1000 level courses (11 participants); large classes (9); small (<50) classes (5); hybrid classes (3); value of classroom personal responder (clicker) use (4); fostering higher order thinking with clickers (4); actual vs. perceived comprehension (4); Web vs. non-Web writing and discussion (2); optimal use of the Web; concept mapping; student study skills; student evaluation of technological communication tools ; motivation; and writing for reflection and analysis of process.

Examples of student learning issues that have been addressed in grant applications are:

Promoting Reflective Learning Through ePortfolio in Composition: A major pedagogical objective of using the ePortfolio, as required in freshman composition courses, is to facilitate lifelong reflective learning. However, first-year students have had difficulty comprehending the immediate benefit of investing time in self-regulating their learning. Therefore, while they do include a draft as well as a final version of the required argumentative research paper in their ePortfolios, they write little or no reflective text on what they learned by taking this course, which introduces them to academic writing and invites them to be a part of this discourse community.

Learning in Large Lectures in Computer Science: This study addresses fundamental issues of teaching and learning in two large lecture courses: Computer Science I (CS-1511) and Introduction to Programming in Visual Basic (CS-1121), typically taught to 100-200 students in large lecture hall settings. A variety of new formats is being used to address diverse learning styles and to enhance the lecture experience. Reflection events are woven into the course at key points to stimulate the evolution of study strategies and inform instruction.

Going Beyond Testing: This study attempts to involve students actively through the use of concept mapping to go beyond mastering the mechanics of calculating inferential statistics and to help them see the relationship between aspects of the course.

Developing an Online Music Theory Resource: My entering freshmen have widely varying degrees of preparation and education. To address this issue and to enable students to work more independently and gain confidence with the subject, I designed brief, model, music composition projects which incorporate essential abstract theory topics. These were imbedded into step-by-step composition model writing which taps into the creative part of their musicality and encourages self-reflection and expression.

Other areas of inquiry include these topics and titles:

- **On-line vs. In-Class Discussion**
- **Enhancing Student Learning Through Innovative Teaching and Technology Strategies**
- **Metacognitive Strategies of Undergraduate Students**
- **Student Study Skills**
- **Personal Response Systems as a Pathway to Self-Regulation and Presence as a Predictor of Performance**
- **The Value of Grading to Help Students Better Prepare for Subsequent Classwork**
- **Connecting Student Outcomes to Exam Preparation Strategies: Promoting Self-Reflective Learning**
- **Reflective Learners and Student Achievement**
- **Closing the Gap: Real vs. Perceived Student Understanding**

Methodology

All UMD Bush participants surveyed their students in some way to help them understand themselves better as learners. Surveys varied in length, purpose, and timing. For example, surveys varied from 5 items to 70-plus items. Some sent their students to the Web to complete learning preference questionnaires such as VARK to determine if they were visual, auditory, read/write or kinesthetic learners <<http://www.vark-learn.com/english/page.asp?p=questionnaire>>. Some directed their students to the Soloman-Felder Index of Learning Styles <<http://www.engr.ncsu.edu/learningstyles/ilsweb.html>> to see if they were sensors or intuitors, or verbal, visual sequential, global, active or reflective learners. Some asked their students complete Marilla Svinicki's GAMES survey instrument which covers goal-orientation, active study, making learning meaningful and memorable, self-monitoring, and use of explaining as a learning technique. Instructors could also avail their students of web-based self-regulation questionnaires or intrinsic motivation questionnaires.

Academic Self Regulation Questionnaire

<http://www.psych.rochester.edu/SDT/measures/selfreg.html>

Intrinsic Motivation Questionnaire

<http://72.14.203.104/search?q=cache:wzZHg7D1X68J:www.cet.edu/research/pdf/motivation.pdf+%22Intrinsic+Motivation+Questionnaire%22&hl=en&gl=us&ct=clnk&cd=1&client=safari>

Instructors surveyed the same students at differing intervals: pre-, mid-, and post-. They asked questions about students' study habits (hours spent studying, study plans/routines, study location or environment, pre-exam strategies, individual or joint study, assigned reading and preparation for class, peer input, use of study guides), grade expectations, goals, satisfaction with grade, plans to improve, confidence levels, comprehension of materials, suggestions for instructional changes, impressions/evaluations of the personal response systems in learning.... Not only do these questionnaires mirror behaviors for students, but they provide corrections for unjustified assumptions that instructors using a lecture approach may have about their students:

...that all students are intelligent, educated persons oriented toward auditory learning; need the same information presented orally at the same time and pace, without dialogue with the presenter, have high working-memory capacities; possess the prerequisite knowledge to benefit from the lecture; and have good note-taking skills. (Johnson, Johnson, and Smith)

Fortified with information from these surveys, Bush members have been reformulating their course goals.

Current Status

Now in the second year of the grant, some UMD instructors are presenting and publishing the results of their classroom research while newcomers in the second cohort of the grant are continuing work on their projects, expanding their efforts, increasing their skills, and following up on their initial endeavors. For example, Bush Colloquium III was presented on Nov. 29th in Kirby Student Center showcasing current projects and providing participants with ideas for innovative teaching and technology-assisted strategies that could enhance student learning in their classrooms. If you are interested in applying for membership in the third cohort, speak with current participants and/or call or e-mail lrutherf@d.umn.edu.

References :

Cooper, J.L. & Robinson, P. (2000). The argument of making large classes seem small. In J. MacGregor, J. L. Cooper, K.A. Smith, & P. Robinson (Ed.) *Strategies for Energizing Large Classes: From Small Groups to Learning Communities* (pp. 5-16). San Francisco: Jossey-Bass.

Garrison, D.R. (Fall, 1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly*. 48 (1), 18-33.

Svinicki, M. (2004). *Learning and motivation in the postsecondary classroom*. Bolton, MA: Anker. 132-133.

Zimmerman, B. J. (1989). A Social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*. 81. 329-339.

Description of Research Project/Interventions/Methodology: (Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)

We assisted Bush participants in their research regarding

- “clickers” (personal responding systems) as they interface with Bloom’s taxonomy.
- ePortfolio
- Web sites
- Surveys online and on paper
- Identifying need and formulating research questions
- Hybrid classes

We are preparing proposals to present at the Academy of Distinguished Teachers Conference on April 23. The clicker group has created its workshop agenda and has almost completed its ADT proposal. They will be giving their workshop here at UMD on March 29, 2007 as a “dress rehearsal.”

Evaluation Plan:

In process. These projects are still evolving. However, we continue to assist in refining and developing research processes and analysis of results. However, in disseminating and presenting their early findings, our workshops help all participants and potential participants in developing a greater understanding of what is involved in the scholarship of teaching.

We will also be able to judge our efficacy by the interest shown by non-participants who attend our workshops and who apply to participate in Cohort 3.

Summary of Outcomes:**Reflection Log/Status: (To be updated at a minimum bi-monthly)****Describe the activities/work you have completed since the last time you reported.**

In addition to attending the bi-weekly Bush meetings this fall semester, we worked with the individual subgroups when needed, continued to informally publicize the work of the group and its individual members, looked for ways to disseminate their findings, searched for resources for them, held workshops that would be useful and interesting to them, as well as facilitating their showcase workshop in Colloquium III.

Shelley and LeAne are on the selection committee for Cohort III. Applications are due on Dec. 20, and the committee will be meeting and deciding on January 4.

During Spring Semester, '07, we will be offering four sessions called "Write Now" to provide support for all faculty who are writing for tenure and/or promotion. However, it is our hope that Bush participants who are publishing their results will also join Write Now.

As an example of an articulated project, Duane Millslagle detailed his Bush project for the IDS newsletter. (See below.) The Spring, '07 newsletter will contain several other articles by participants who have reached a publishable stage.

A Study of Meta-cognitive Learning Strategies among Undergraduate Students and between Courses Delivered Face-to-face and Online**Duane Millslagle.**

Why are some students more successful than others in achieving academic success? It may be due to the way they control and direct their cognitive processes through the use of appropriate meta-cognitive learning strategies. Meta-cognitive learning strategies are tools that learners use to achieve their desired outcome with minimal effort (Zimmerman, 2004- personal conversation). Zimmerman and Martinez-Pons (1986, 1988) found evidence that meta-cognitive learning strategies were highly correlated with achievement indices and highly predictive of students' performance in class. Some of the common meta-cognitive strategies that were identified by Zimmerman and Martinez-Pons (1986, 1988) are self-evaluating, goal-setting and planning, seeking information, keeping records, environmental structuring, rehearsing or memorizing, reviewing records, and seeking social assistance.

Meta-cognitive strategies are not innate but are developed by the learner (McComb, 1989; Zimmerman, 1998; Zimmerman, Bonner, & Kovach, 1996; Zimmerman & Kitsantas, 1997). Once the meta-cognitive strategies are developed, the learner is able to implement these strategies to improve personal functioning and academic performance. The continued high achievement level of a learner is dependent on the consistent successful use of these meta-cognitive learning strategies.

The purposes of this study were: 1) to identify what meta-cognitive learning strategies were used by undergraduate students, and 2) to investigate differences among the meta-cognitive learning strategies between successful and unsuccessful students across courses delivered face-to-face and online.

Subjects

A total of 148 undergraduate students enrolled in a course on the psychological aspects of coaching across a three-year period participated in this study. In the first year, 57 undergraduate students participated in an activity that identified what metacognitive learning strategies made them successful or unsuccessful in the course. During second and third years, the study involved 53 students in two face-to-face sections of the course, and 38 students in two online WebCT sections of the course. The students voluntarily took part in the study and were provided extra credit for completing the activities and/or inventory about their meta-cognitive learning strategies. The students were earning a bachelor's degree in a variety of majors and/or were taking the course to complete a coaching minor.

Survey Instruments

The data collection instrument employed to identify what meta-cognitive learning strategies were used by the students in the course during the first year included two open-ended questions: 1) What strategies do you use that make you successful in earning high grades? and 2) What strategies do you use that make you unsuccessful in earning high grades? Following the data collection, the investigator classified the responses into meaningful categories using a content analysis process in which words or phrases used by the students were grouped into minor categories, which were subsequently grouped into major categories. By grouping the students' responses, four major metacognitive strategies emerged: record keeping, planning and goal setting, seeking information, and environmental structuring.

A two-part learning strategy instrument was developed to assess each meta-cognitive strategy. Part one assessed each student's expected final grade in the course. The expected final grade was used to identify the successful and unsuccessful students in the study and within each type of delivered courses.

The operational definition of a successful or unsuccessful student in the study was dependent on the student's expected course final grade stated at the beginning of the class and the actual final grade. If students' initial grade expectations matched their actual final grade or their final grade was higher than their initial grade expectation, they were classified as successful students. If students' initial grade expectations were higher than the actual final grade, they were classified as unsuccessful students. During the second and third years, 49 students were classified as successful, including 27 students in the face-to-face courses and 22 students in the online courses. Forty-two students were classified as unsuccessful, including 26 in the face-to-face courses and 16 in the online courses.

The second part of the survey included 20 ranking, listing, and open-ended questions about the meta-cognitive strategies of interest in this study. Two identical versions of the survey were developed: a pencil-paper instrument for the face-to-face courses and an online version for the online courses using WebCT.

Procedure

The learning module content, grading criteria, methods of evaluation, and course materials were similar for the face-to-face and online courses. The course resources included the text, instructor notes, and PowerPoint presentations. The two online courses were delivered through WebCT.

Permission from the Human Subjects Committee was obtained prior to data collection. The students completed the course expectation part of the survey during the first learning module of the course and the 20-question meta-cognitive learning strategy survey after the last learning module of the course.

Data Analysis

Analysis of results for each item on the meta-cognitive learning strategy survey depended upon the type of question. For the ranking and multiple choice questions, the results were obtained by tallying the students' choices and then summing the tallies. Due to the nominal nature of the data, the recommended analytic method was to report the sum tallied scores for these questions and to calculate percentages (Pattern, 1998).

Content analysis, as described for the first-year survey above, was also used to translate responses to the open-ended questions on the meta-cognitive learning strategies survey.

Results & Discussion

Students identified four meta-cognitive strategies (record keeping, planning and goal setting, seeking information, and environmental structuring) used to achieve a higher grade in the course. Each meta-cognitive learning strategy of interest in this study will be discussed from the standpoint of the type of course delivery (face-to-face or online) and type of student (successful and unsuccessful).

Record keeping

Types of courses. Note taking is a record keeping meta-cognitive learning strategy that a learner uses to record the events of class or the resources of the course content; notes are later reviewed when preparing for a test. In the face-to-face courses, note taking was the primary study strategy for the students. In the online courses, 65% of the students did not take notes. In the online course, note taking took the form of was highlighting to mark the important phrases or statements in the reading materials.

Type of student. The successful students reviewed the notes before reading the course materials, whereas the unsuccessful students memorized them before taking the tests. Both the successful and unsuccessful students used note taking to clarify the reading materials required in the courses.

Note taking, of course, was very evident in the face-to-face course where the instructor verbally presented the material which students recorded for later study. But in the online courses, more of the material was presented in written format and was accessible for longer periods of time for review and potential highlighting by the students

Information seeking

Type of course. Reading and the ability to understand what is read is a student-initiated, information-seeking, meta-cognitive learning strategy. Seventy-five percent of the students in the face-to-face course reported reading the assigned materials compared with 97% of the students in the online course. Students in the face-to-face course reported reading the materials after the lecture was given by the instructor. Students in both types of courses reported that they took frequent breaks and underlined key sentences and phrases while reading. The time required to read one chapter of the text differed between students in the face-to-face and online courses. In the face-to-face course the students took an average of 1 hour to read the chapter whereas the students in the online course took 1.5 hours. The students' perceived reading comprehension of the course reading materials associated with the chapters of the text and PowerPoint slides were lower in the face-to-face course (6.4 out of 10) than in the online course (7.5 out of 10).

These results indicate that the students in the face-to-face course were less likely to read the assigned reading materials and spent less time in reading the materials compared with the students taking the course online. These results suggest that reading of the material in the online course was a primary learning strategy to achieve a high grade in the course, and students who take online classes have a higher perceived level of reading comprehension than students who take face-to-face courses.

Type of student. Many similarities were found between the unsuccessful and successful students across the two types of course delivery. Successful students read the materials at least twice, underlined key phrases and terms while they read, and had a perceived reading comprehension rating of 8.5 out of 10. Unsuccessful students did not read the materials and had a perceived reading comprehension rating in the face-to-face course of 5.9 and in the online course of 6.3.

Students who take the online course may be drawn to taking these courses because they possess a higher level of ability to comprehend the reading material. The student's level of reading comprehension may be an important learning strategy in being successful in online courses. One major difference between the successful and the unsuccessful student was that the successful student read the materials and the unsuccessful student did not. One reason for this finding may be that the unsuccessful student comprehension of the materials was perceived as low, thus affecting their motivation to read the materials.

Planning and Goals Setting

Type of course. In the face-to-face courses, 26% of the students set daily or weekly study goals compared with 60% of the students in the online courses. In planning for the upcoming test, 62% of the students in the face-to-face course indicated taking good notes and reviewing the notes frequently were their primary goals while 55% of the students in the online course indicated that reading the course materials was their primary goal. The primary planning strategy for the students in both types of course delivery was setting aside time in their schedule to study. The students taking the online course set more frequent goals, and the goals related to information seeking learning strategies. The student in the face-to-face course set goals less frequently, and the goals were related to the recording keeping learning strategy.

Type of student. Again, similarities in goal-setting and planning were found among the unsuccessful and successful students in both types of course delivery. The successful students in both types of course delivery set daily and weekly study goals, whereas the unsuccessful students did not set goals. The primary planning strategy in the successful students was related to information-seeking, that is, how they read the assigned materials. The primary planning strategy in the unsuccessful students was related to environmental structuring, that is, to set more time aside to study. It seems that the successful students' efforts in learning were directed to changing how they studied, and unsuccessful students' efforts were directed to studying longer.

Environmental structuring

Type of course. The environmental structuring meta-cognitive learning strategy is a student-initiated effort to select or arrange the physical environment to make learning easier. This strategy was categorized in this study as the study habits of the students. In the face-to-face and online courses, the students studied at home in a quiet place with few distractions during the evening hours. The study time of both the unsuccessful and successful students in both types of the courses was reported to be the same; 8-10 hours per learning module.

Type of student. Few differences appeared between the successful and unsuccessful in study habits. They studied 8-10 hours per learning module at home, during the evening hours in a place with few distractions. Successful students in the face-to-face and online courses had a set

study routine while the unsuccessful students did not have a set study routine.

Students' efforts to structure the learning environment to make learning easier are similar between courses and type of student. One interesting finding was that study time was not affected by type of course or type of student. This similarity in the duration of study suggests that the amount of study does not directly determine high achievement in the class, and based on the differences found in the learning strategies, successful students study differently than unsuccessful students within the same study time.

Conclusion and Implications

This study identified four meta-cognitive learning strategies that were important in achieving a higher grade in a course. Investigation of how the students used these strategies in face-to-face or online courses found similarity in the environmental structuring of the students, but found differences in their record keeping, information seeking, and goal setting and planning. The study identified differences between successful and unsuccessful students' use of meta-cognitive strategies with the exception of environmental structuring, but differences among the successful or unsuccessful students by type of delivery was not found.

These results support the contentions of Zimmerman (1998) that meta-cognitive strategies may be a reason for student success or failure in desired goal achievement. Zimmerman et. al., (1996) have provided a series of exercises that teachers could use to develop meta-cognitive strategies in their students. Though written for middle and high school teachers, these exercises could be modified for professors at the postsecondary level in any college course. The professor would have students self-evaluate and monitor study habits and strategies, and reflect on strengths and weaknesses of their approach to their study methods. Following this self-evaluation period, the teacher's role is to provide graded opportunities to gauge the implementation of new or modified learning strategies. In addition, the teacher could model the learning strategies or provide specific assistances to help students develop new learning strategies (Zimmerman, 1996).

References

- McCombs, B.L. (1989). Self-regulatory learning and academic achievement: a phenomenology view. In B.J. Zimmerman & D.H. Schunk (Eds.), *Self-regulatory learning and academic achievement theory, research, and practice: Progress in cognitive development research* (pp. 51-82). New York: Springer-Verlag.
- Pattern, M. (1998). *Questionnaire research: A practical guide*. Los Angeles: Pyczak Publishing.
- Zimmerman, B.J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, 81(3), 329-339.
- Zimmerman, B.J. (1998) Academic studying and the development of personal skill: a self-regulatory perspective. *Educational Psychologist*, 33(2/3), 73-86.
- Zimmerman, B.J., Bonner, S., & Kovach, R. (1996) *Developing self-regulated learners: Beyond achievement of self-efficacy*. American Psychological Association: Washington, D.C.
- Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, 23, 614-628.
- Zimmerman, B.J., & Martinez-Pons, M. (1988) Construct validation of a strategy model of student self-regulated learning. *Journal of Educational Psychology*, 80, 284-290.

Zimmerman, B. J., & Kitsantas, A. (1997). Developmental phases in self-regulation: Shifting from process goals to outcome goals. *Journal of Educational Psychology*, 89, 29-36.

What successes have you experienced with your work/project?

The Bush Grant participants model methods for engaging students. Other faculty members who are not yet involved with this grant are inquiring about becoming involved and applying for the cohort.

In the Early Career Series we are able to refer to the Bush Grant projects as exemplary.

Cross-disciplinary connections are proving valuable.

Bush faculty have embraced new technologies, e.g., prs systems, WebCT, interactive Web technology such as wikis and blogs.

Conversation across disciplines about teaching and learning have been fostered by having grant involvement.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

Everyone is busy! Time is at a premium. However, that said, attendance at Bush functions has been exemplary. At first, developing an *esprit de corps* looked daunting. Now I see teamwork and a kind of group pride.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

Now that we have seen a report on Bush activities on all four campuses, we are eager to receive suggestions from the consultants.

How are you using collaboration within your project?

Our role in the project is to collaborate with all participants and to assist them in collaborating with each other and in any way possible.

In arranging for Karl Smith to present two workshops on Jan. 30, 2007, we have arranged for collaborative funding from Bush, IDS, and the University Education Association.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

We have organized three venues for participants to showcase their research. We will also be able to help them in writing and placing their projects in discipline-specific journals through Write Now and other, as yet to be organized, groups.

We are bringing a consultant/national expert on the scholarship of teaching from the Twin Cities—Dr. Karl Smith—to exemplify and demonstrate utilizing a scholarly approach to teaching and research in the sciences and also in large classes.

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: Duluth

Faculty Member(s)/Instructor: Steve Vanderheiden

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): 1

Course Impacted by Research: Ethics & Society (PHIL 1003)

Course Description: *(Please provide the course overview that appears in course bulletins)*

Classic theories addressing questions of whether morality is subjective or objective, cultural relativism versus universal rules, how right and wrong should be determined. Moral issues such as euthanasia, the environment, population and birth control, nuclear deterrence, alternative lifestyles, and capital punishment in the international dimension.

Student Learning/Teaching Issue/Research Question:

How can I increase student reading and comprehension, and critical thinking skills? As a related issue, how can I better encourage class attendance and the careful reading of assigned texts?

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

In Fall semester 2006, I plan to offer several outside-of-class exercises (using Web CT) designed to encourage students to think and write critically. In addition, I plan to spend more time (given the large number of first semester freshmen in the class) encouraging reflecting learning skills, and to use some survey instruments to measure progress toward this end.

Evaluation Plan:

As noted above, I will evaluate progress based upon these surveys (designed to assess how effectively students incorporate reflective learning and other reading and study skills) into their regular preparation for class. In addition, I will compare attendance records and course evaluations from previous sections of PHIL 1003, and will evaluate (qualitatively) the usefulness of the Web CT components of the course.

Summary of Outcomes:

Data to be gathered during Fall semester 2006 (so none to report yet).

Reflection Log/Status: (To be updated at a minimum bi-monthly)***Describe the activities/work you have completed since the last time you reported.***

Have attended several more Bush grant meetings (haven't missed any since joining the second cohort), as well as one small group meeting (on Hybrid Distance Learning, led by Mark Harvey). In addition, have opened a Web CT development site with ITSS and have begun planning for course redesign.

What successes have you experienced with your work/project?

I'm learning a lot, but have yet to implement any ideas into course design (this is my first semester on the Bush team).

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

See above (no implementation = no implementation problems)

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

See above (no data = no project adjustments)

How are you using collaboration within your project?

I'm currently collaborating with other Bush faculty at UMD, as well as others within the U of M system (through videoconferencing), as well as with a small group that concentrates on large introductory courses. In the future, I plan to disseminate my research findings within my two departments and at a professional teaching conference, so future collaboration is planned.

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

I plan to summarize my findings and present them at a professional conference in February 2007 (the APSA Teaching and Learning conference).

**University of Minnesota
Bush Foundation Grant
Research Course Profiles
Year 2**

Campus: Duluth

Faculty Member(s)/Instructor: Janelle Wilson

Number of people involved in course redesign/research team (e.g., teaching specialists, graduate TAs, undergraduate TAs, technical support persons, consultants, etc.): I have one undergraduate research assistant who is conducting interviews and focus groups with students.

Course Impacted by Research: Soc 1080: Development of Social Selves (and probably other classes taught in the future)

Course Description: *(Please provide the course overview that appears in course bulletins)*

Examines how the self develops. The primary focus is the socialization process, a process which continues throughout the life course. Special attention will be given to childhood and adolescent socialization. How do we learn? How do we understand behavior? What are the consequences of inadequate socialization?

Student Learning/Teaching Issue/Research Question:

1. Motivating students to be sure to read all of the assigned reading materials.
2. Improving class attendance.

Description of Research Project/Interventions/Methodology: *(Include specific research question and teaching and/or technology intervention strategies, e.g., learning style tests, new case studies, use of web forum, use of games, etc.)*

Key research questions include:

What are some effective ways of motivating students to read the assigned materials?

What are some effective ways of improving class attendance?

How can we make learning more intrinsically valuable to students? How can self-efficacy be enhanced?

My main focus is on assessing whether or not students do the assigned readings in their classes. I would like to arrive at ways to encourage students to do all of the reading, but in a way that is supportive and positive, rather than relying upon fear tactics.

In my Social Psychology class last Spring semester, I included an extra credit assignment that students could choose to complete, involving their recording how much time they spend on work related to this class, and also describing what they are learning, etc. The number of students who turned in this extra credit assignment was 12 (this was out of 39 students enrolled in the class). There were 35 points possible for the assignment. Students' scores ranged from 20 to 35. Students were supposed to report the amount of time they spent on reading and studying for this class per week (as well as give a reaction to what they read, etc.). The amount of time that the students reported spending on this class ranged from 20 minutes to 4.5 hours per week. Not surprisingly, the amount of time reported correlated positively with students' grades – the more time reported, the better the grade. Among the students who completed this extra credit

assignment, four individuals earned an “A” in the class, four earned an “A-“, two earned a “B”, one earned a “B-“, and one earned a “C.” In the class as a whole, grades in the “B” range constitute the mode.

There is a general rule that says: for every hour you’re in class, you should spend 3 hours reading and studying. This would mean 9 hours per week for a 3-credit course. However, among the 12 students who did this extra credit assignment and reported the amount of time they spent on this class, 4.5 hours was the upper limit of time recorded.

There was certainly evidence, in the extra credit assignments that were turned in, that some of the students were reflecting on what they were learning, applying the material, and seemingly benefiting from the new knowledge.

I also did a bit of informal data gathering in this class: I shared the following with the class on April 24, 2006 – this is from the book written by an anthropologist who became a freshman student at the university where she teaches (*My Freshman Year: What a Professor Learned by Becoming a Student* by “Rebekah Nathan” (pseudo-name). Ithaca, New York: Cornell University Press, 2005)...

Students mentally ask themselves a series of questions, so as to decide whether they should do the required reading in their courses:

‘Will there be a test or quiz on the material?’

‘Is the reading something that I will need in order to be able to do the homework?’

‘Will we directly discuss this in class in such a way that I am likely to have to personally and publicly respond or otherwise “perform” in relation to this reading?’

The author notes that, if the answer to all of these questions is “no,” then students don’t do the reading, or at least the probability of them not doing the reading is much higher. (p. 138)

I asked my students for their thoughts/reactions to this. One student said that if the instructor is assigning reading material that is not covered on a test or in some way covered in the class, then the instructor shouldn’t be requiring it. (I suggested that instructors may recommend reading that is relevant to the subject matter of the class, such that reading it will enrich learning, etc.). Another student noted that if a book is boring, then she doesn’t read it. Another student indicated that if students will be expected to discuss reading material in the class, then this will motivate them to read. On the other hand, if the only way that their not reading the material is reflected is through their performance on a test or quiz, then this is less of a motivator because it is private as opposed to public. One other student said that if professors go over material in the classroom that duplicates what the textbook covers, then this is a disincentive to reading.

I was able to hire an undergraduate research assistant as part of this project. My research assistant, Annie (a Sociology major who is interested in the Sociology of Education) has been conducting interviews with students during the fall semester. She has also moderated two focus groups. These individual and focus group interviews are a way to learn more about where students are at – with their current self-regulation abilities and amount of self-efficacy as well as their perceptions of college, future goals, and attitudes toward the college learning environment. Such data (even though from a convenience sample of students) should help instructors to know what they are dealing with, and what pedagogical techniques may work best.

Evaluation Plan:

I think of my evaluation plan involving collecting data that will give me a better idea of where students are at in terms of their goals and strategies. While I realize that the data currently being collected by my research assistant cannot be generalized, I do think that the data will be useful.

Summary of Outcomes:

Last summer, I analyzed the qualitative data that the extra credit assignment provided. My research assistant is in the process of conducting interviews and transcribing them – a very time-consuming project!

Reflection Log/Status: (To be updated at a minimum bi-monthly)**Describe the activities/work you have completed since the last time you reported.**

I acted as “note-taker/observer” at a focus group interview that Annie moderated earlier this semester.

What successes have you experienced with your work/project?

I feel that data are being gathered that will be useful to me as I attempt to arrive at strategies to encourage students to read the assigned materials.

The involvement of Annie in the project has been rewarding all the way around. It is encouraging to see her enthusiasm in working on the project. And she is sort of a liaison between me and students.

What challenges have you encountered with your research or implementation? (Consider activities or events that have not worked as well as you had hoped or expected.)

I was surprised that more students did not complete the extra credit assignment during spring semester last year.

Annie is working on the project as she is able, but she is balancing work and school (like so many of our students), and so the data collection is taking longer than I had anticipated.

What project adjustments have you made based on the data analysis, student reactions, feedback from consultants, etc.?

I feel that I have become more focused on and more committed to finding ways to encourage students to do their assigned reading in their classes (and, more generally, to find out where students are at with their self-regulation and reflexivity). I wish to learn more about the goals that students have as well as their challenges. In essence, I want to be able to take the role of the student.

How are you using collaboration within your project?

N/A

How are you utilizing a scholarly approach to teaching within your project? (i.e. research/articles collected for your project, presentations to faculty or at conferences, articles written, etc.)

Two articles that I read in Summer 2006 that are relevant to this grant project include:

“Cooperative Learning Returns to College: What Evidence Is There That It Works?”

By David W. Johnson, Roger T. Johnson, & Karl A. Smith

(in *Change*, July/August 1998, pp. 27-35).

This article provides a review of the theory underlying the use of cooperative learning, the research that has been conducted, and describes ways that it may be used in college classes. (Theories discussed include social interdependence theory, cognitive-developmental theory, behavioral learning theory).

“Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal Setting,” by Barry J. Zimmerman, Albert Bandura, & Manuel Martinez-Pons (in *American Educational Research Journal*, vol. 29, no. 3, 1992, pp. 663-676).

A scale for “Self-Efficacy for Self-Regulated Learning” is shown in this article.

The scale is as follows:

How well can you:

1. finish homework assignments by deadlines?
2. study when there are other interesting things to do?
3. concentrate on school subjects?
4. take class notes of class instruction?
5. use the library to get information for class assignments?
6. plan your schoolwork?
7. organize your schoolwork?
8. remember information presented in class and textbooks?
9. arrange a place to study without distractions?
10. motivate yourself to do schoolwork?
11. participate in class discussions?

Students rate their perceived self-efficacy according to a 7-point scale. The descriptions are “not well at all” for a rating of 1, “not too well” for 3, “pretty well” for 5, and “very well” for 7.

(Perhaps this questionnaire should be administered to incoming freshmen? I am thinking about administering it in my freshman class next semester).

The authors of the article state that “perceived efficacy to achieve motivates academic attainment both directly and indirectly by influencing personal goal setting. Self-efficacy and goals in combination contribute to subsequent academic attainments.”

The authors note that “Academic self-regulation is concerned with the degree to which students are metacognitively, motivationally, and behaviorally proactive regulators of their own learning process...From a social cognitive perspective, self-regulated learners direct their learning processes and attainments by setting challenging goals for themselves, by applying appropriate strategies to achieve their goals, and by enlisting self-regulative influences that motivate and guide their efforts” (p. 664).

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Pam Solvie**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: **ELED 3102 Literacy and Language Instruction in the E. Sch.**

Number of Students Impacted by Course Twenty-two

Student Learning/Teaching Issue: ***Implementing Kolb's Learning Style Model in the Delivery of Education Curriculum***

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: fall, 2006

Course Description: *(Please provide the course overview that appears in course bulletins)*

From course bulletin

ELED 3102 - Literacy and Language Instruction in the Elementary School

(4.0 cr; Prereq-admission to elementary teacher education program; fall, every year)

Beginning and advanced reading instruction in the elementary grades. Includes study of theory, issues, literacy frameworks, assessment, materials, organization, and instructional strategies to scaffold children's literacy development.

Description of Research Project: *(Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)*

Much was accomplished as a result of my 2005 Bush Grant project to enhance student learning, improve delivery of course content, and increase communication with and among students. Findings from the data point to changes and additions to this project that may benefit student learning. As a result of these finding I will work on the following things that will support student learning during class presentations, in follow-up after class presentations, and as a result of improved communication with students about course content. Use technology to address assessment and evaluation in the course by implementing frequent and consistent checks of student work, student understanding, and student achievement. Create rubrics/checklists for all course projects. Use technology to allow students to complete self assessments and submit these electronically. Investigate and make use of the polling device within the discussion board to request feedback on student learning and use frequent checks within Breeze.

- Continue to use Kolb's learning style model with increased attention to learning styles in the course (discussions, reflections, information presented, explicit naming of activities and purpose). Focus attention on Kolb's Four-Stage Learning Cycle in class presentations using technology tools at each stage of this learning cycle.

- Improve the use of the discussion board by using higher level questions to promote higher level thinking. Make use of UM Wiki.
- Make use of podcasting and Breeze Presenter sessions for review of course material (saving class time formerly used to review the protocol for reading and writing analysis components in the class). Create 4 Breeze Presenter sessions for projects that involve important protocol and sequence. (Investigate use of Flash within the Breeze presentations.) Use these podcast/vodcasts and Breeze sessions to assist students in preparation for assessment of course content as well as the practical application of this information in their practicum classrooms.

Activities/Work completed:

- (8/2/06) I continue to work on Breeze information and will upload this work soon, as Breeze presentations. I continue to work with Moodle for use a course management tool. I have also continued to work with iMovie and Windows Movie Maker for instructor and student presentations. I've also investigated use of concept maps for formative and summative assessment purposes.
- (7/3/06) At this point, with the help of Matt Senger, I have a SMF Discussion Board ready for use in my project course. I will set parameters for each section of my course and will prepare question prompts and a schedule. Molly and Brady have assisted me with set up of a wiki for my course. I will review the reference guides and prepare the wiki for use in class. Nic has helped me set up Moodle as a course management tool and provided great assistance in use of this tool for my project class. I will continue to investigate the tools available and select ones for use in my course. I have been working on a script for Breeze Presenter.
- (5/31/06) I have decided to make use of David A. Kolb's Learning Style model and am organizing my course and instruction around this model. I have obtained The Kolb Learning Style Inventory (version 3.1) for use with students in ELED 3102, the course that is the focus of my project. I have completed an IRB form for research that is a part of this project. I have met with Molly, Brad, and Trent about a calendar for submission of course assignments, setting up a wiki, and creation of video clips. They have found several useful tutorials for me to review. I've also spoken with them about organization of my course webpage and we discussed how it might be organized around Kolb's themes. Trent and Brady have helped with setting up a discussion board and review of calendar tools. I have met with Nic and Pam, consultants for my project. Discussion involved discussion boards, Moodle, and Breeze Presenter. I am excited about the possibility of collecting data on who and how often the Breeze Presentations are accessed. This information will be helpful in determining how useful the tool is in supporting student learning. Tools within Moodle may prove helpful for me as well, including a calendar and an RSS Aggregator.
- (12/11/06) Students in ELED 3102 completed discussion board and wiki exercises and had access to Breeze Presenter that included information on the reading and writing analysis project. Students in ELED 3102 have completed a midsemester and end of semester course questionnaire. Questions pertained to use of technology tools in the course and their value in supporting learning styles and learning course content. The questionnaires and reflections on assignments that required use of technology tools are being evaluated. The data is being reviewed through the lens of Kolb's learning styles.

Scholarly approach:

I continue to read more about Kolb's learning cycle model and the four identified learning styles. I am working to more clearly link the technology tasks to these identified styles. I am also considering how I can help students use task analysis to think about the tasks involved in projects. For example, what skills might a diverger need to focus on when completing a task that is largely focused on theory and research?

Successes/Challenges encountered:

- (8/2/06) All of this work has proven successful. I am excited about the use of these tools and presentations for my fall course.
- (7/3/06) All of the work described above has been successful. I will continue to work with and add to each of these 'pieces' this month.
- (7/3/06) Some project tasks are taking a bit longer than I had envisioned. For example, creating Breeze presentations is taking some time, but I am excited about anticipated results.
- (5/31/06) All of the above tasks have been successful for me. In addition, the project planner will help me stay focused and meet my project goals.
- (5/31/06) At this point I have received a great deal of information. While all of this is great I realize it will take time to sort through it and make use of it in tangible ways.
- (10/4/06) I have successfully created, uploaded, and used a Breeze Presentation with my students. While my goal was four, I learned from creation of this first one that much time is involved in planning, scripting, and creating the presentation. It has been a wonderful tool for teaching and I hope it will serve as a wonderful resource for my students' learning as they revisit the presentation as a whole or for the individual components within the whole. I will continue to work on the other three presentations over time.
- (10/4/06) Due to the difficulties with Moodle on the server I lost my Moodle site and as it could not be retrieved I set up a new site. However I have not developed it to the point I had it at the end of the summer and therefore am not using it for my language arts students at this point. I hope to continue work and use it the next time I teach the course.

Assessment/Evaluation of the project:

- Data will be collected on students' use of technology tools. Both quantitative and qualitative data will be used to evaluate students' learning as supported through use of these technology tools.

Feedback received:

- (7/3/06) I greatly enjoyed discussing assessment with others involved in the Bush Grant projects at the recent workshop on assessment (June 20th). As a result of these discussions I came away with some great ideas about task analysis in terms of helping students understand expectations for course activities and assignments. I hope to use these ideas to support integration of learning styles in my course project.
- (5/31/06) Questions others ask about my project are prompted by their interest in the capabilities of certain tools and how they might be applied in their work. This sharing of ideas and information is exciting.
- (10/4/06) E-mails to my consultants (Pam and Nic) even in the fall (after summer work concluded) yielded great support and useful information and direction. Most recently this support and feedback regarded use of Moodle and uploading Breeze presentations.

Feedback from the TEL Office:

1. Pam requested a number of things for her project. The TEL office has aided her in the following:
 - The creation of a UMWiki
 - The assessment of various calendar systems for her students
 - Help with iMovie and Windows Movie Maker
 - The creation of a new SMF discussion board
 - Course webpage edits
 - Information of the progress of the Croquet project
 - Information on Moodle
 - The location of video clips of children's book authors speaking and reading
2. The TEL office had little communication with the office towards the end of the summer.

Feedback from consulting group:

- Pam Solvie continues to be one of our most involved participants in not only her own project, but other Bush Grant projects as well. It is wonderful to see her try new tools and become successful with them. Pam's willingness to work with everyone and share her knowledge is a true asset to this grant and to UMM faculty, staff, and students. (Pam Gades)

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Carol Marxen**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: EIEd 4103 Science in the Elementary School

EIEd 4107 Health and Physical Education in the Elementary School

Number of Students Impacted by Course 30

Student Learning/Teaching Issue: **Increasing Technology in Elementary Education with the ProScope Microscope**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: Fall, 2006

Course Description: (Please provide the course overview that appears in course bulletins)

From course bulletin

EIEd 4103 Science in the Elementary School: Standards, curriculum, and assessment of elementary school science. Includes theoretical basis of methodology and its application, assessment, selection and use of instructional media and computer software, and meeting the needs of cultural diverse and special needs students.

EIEd 4107 Health and Physical Education in the Elementary School: Scope, sequence, and related activities in elementary health and physical education

Description of Research Project: (Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)

Students who enroll in my ELED 4103 Science in the Elementary School are at varying levels of confidence and competence in science subject matter. Research verifies that the majority of preservice elementary teachers, of whom the majority are females, do not like science and are not motivated to teach it. To help students learn about science and demonstrate new ways to teach science in the elementary classroom, I would like to integrate more technology into my course. I am hoping to increase future elementary teacher's content knowledge in science, as well as to demonstrate a way in which they can motivate their elementary students in engaging science lessons.

More specifically, I want to learn how to use and effectively integrate the ProScope microscope into my ELED 4103 Science in the Elementary Classroom School course through demonstration lessons. In addition, the students will plan lessons using the ProScope microscope. The ProScope microscope displays and captures still images, movies, and time lapse movies directly to a computer for image viewing in class or in the filed.

I will create pre – and post assessments to evaluate the student's increase in subject matter

knowledge, and their motivation to teach science. In addition, I will look for how they integrated technology into their elementary science unit and lessons.

Activities/Work completed:

- (7/31/06) I searched the ProScope website to find ideas for lessons. I wrote one demonstration lesson plan and am working on a second one.
- (7/5/06) I am currently working on my science syllabus for fall to evaluate where I can best integrate the demonstration lessons with the Proscope. I have also used some articles in which elementary teachers have used similar (tone) in classroom lessons.
- (6/14/06) Kristen and I met on June 8 and loaded the ProScope software on my laptop computer. We also explores some of the capabilities of the microscope.

Scholarly approach:

Successes/Challenges encountered:

- 8/28/06 The same elementary education students are in EIED 4107 and EIED
- I found that this is a tool that can be used in my health class as well as science, so I created a lesson for my health class using the ProScope microscope.
- (7/31/06) I tried the proscope out with my grandchildren, ages 11 and 14 to see if my lesson would be appropriate. First, I let them explore with the proscope--which gave me an idea of what 6-9 graders would do with it on their own. They were most interested in looking at gross body parts such as ear wax, buggers, moles, scabs, and pimples. The lesson I wrote on mealworms went fine, except they were more motivated when they were exploring on their own--very typical of this age!! The lesson will be easier to implement in a classroom.
- (7/31/06) The only challenge I have is that I have too many ideas for lesson demonstrations and not enough class time to do all of them. Although, my students may be trying some of them out in their student teaching classrooms next spring.
- (7/5/06) The challenge is to decide which lessons to use as I have too many ideas and not enough time in the (day).
- (6/14/06) We successfully loaded the software and brainstormed ideas on lessons that could be used in my science methods course.
- (6/14/06) Due to some glitches--it took us over an hour to load the software--but with Kristen's expertise and problem solving skills--we were successful. Or should I say, she was successful. I could not have accomplished it without her!!

Assessment/Evaluation of the project:

Feedback received:

Feedback from the TEL Office:

1. Carol has worked relatively independently from the TEL office, though we did have had a bit of communication with her. We located a few articles on the use of the ProScope as well as female engagement in the sciences. The progress of this project seemed to be in-line with the project planner.

Feedback from consulting group:

- Dr. Marxen and I worked together to get her started using this technology. She had planned to contact me when her students begin using the ProScope in classes, and I would be interested in hearing how that goes even if my help is not needed. This tool seemed like it would be really fun for kids, or even adults.
- Carol's project required the expertise of primarily one member of the consulting group. However, we are excited about Carol's project and ready to assist in whatever way possible. Much of the project centers on the pedagogy and proper use of the ProScope rather than simply learning how to use it on a technical level. Carol has extensive knowledge and understanding of pedagogy; therefore, she needed relatively little assistance from the group. We look forward to seeing the data outcomes of the assessment process Carol is implementing.

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Nancy Carpenter**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: Chem 2301-2: Organic Chem I- II

Number of Students Impacted by Course 70

Student Learning/Teaching Issue: **Increasing Student Engagement in the Organic Chemistry Curriculum through Instructional Technology**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: Until we are able to figure out funding for the purchase of the PRS systems, we cannot implement and assess this aspect of the project. Self-assessment re. the utility of other aspects (chat, smartpad) will be collected at the end of each course (fall 2006, spring 2007)

Course Description: *(Please provide the course overview that appears in course bulletins)*

2301: Introduction to the structure and reactivity of organic molecules; nomenclature and functional groups; stereochemistry; mechanisms of substitution and elimination pathways; physical organic chemistry; introduction to synthetic strategy; fundamentals of spectroscopic techniques.

2302: Continuation of topics from Chem 2301; spectroscopy; chemistry of polyenes, aromatic systems, and amines; enol and enolate chemistry; free-radical chemistry; retrosynthetic analysis; special topics.

Description of Research Project: *(Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)*

Research on the use of personal response systems ("clickers") in lecture classes was carried out over the summer of 2006. As noted above, a date for implementation is unknown, but ideally would be spring 2007. Implementation of the use of a "smartpad" (already purchased) into Chem 2301 will take place during fall 2006. Improvement/enhancement of my use of WebCT in this course is ongoing. Finally, I would like to take advantage of UMChat as an interactive tool for use with my students (also fall-spring 06-07).

Activities/Work completed:

- (7/31/06) evaluated turning point system, helped set up and attended Greg Thorson's presentation on e-instruction PRS system
- (7/10/06)- Got the meeting set up to review clicker work by Benson and Thorson, and evaluate demo clickers - Interviewed Greg Thorson re. his work with clickers
- Have been reading info about classroom response systems
- Fall 2006: using UMChat and WebCT in 2301. About to start using smart pad.

Scholarly approach:

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Successes/Challenges encountered:

<ul style="list-style-type: none"> - (7/31/06) evaluated turning point system, helped set up and attended Greg Thorson's presentation on e-instruction PRS system - (7/31/06) It would have been nice if we could have had "all" (or at least several) of the PRS systems available for evaluation at the same time and place. - (7/10/06) All of the activities describe above (in (1)) have been successful and informative - (7/10/06) It is inconceivable to me that there has been so much work on/with clickers and so few informative OVERVIEW/SUMMATIVE articles. - Fall 2006: funding for PRS system remains to be found.

Assessment/Evaluation of the project:

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Feedback received:

<ul style="list-style-type: none"> - 7/31/06) n/a - (7/10/06) n/a

Feedback from the TEL Office:

<ul style="list-style-type: none"> - The TEL office located a number of resources on PRS and Moodle for this project. We have also demonstrated the use of two PRS systems for Nancy. The progress of this project seemed to be in-line with the project planner.
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Feedback from consulting group:

<ul style="list-style-type: none"> - Dr. Carpenter seemed to have things under control for this project. I would be curious to find out how easily the "smartpad" can be integrated with the PRS, and which PRS she ended up using. - We were able to evaluate both the e-Instruction RF CPS and the Turning Point RF systems. Turning Point is not going to be an option because it is not cross—platform. We are still going to have two additional evaluation systems delivered to UMM for demo and practice: iClicker and GTO-Calcomp (InterWrite PRS). This is being arranged by Media Services and Computing Services. The barrier to purchasing a system is mainly that whatever system is chosen needs to be a campus decision. We are hoping that we can make the decision and have a system purchased by the end of Fall semester. I look forward to working with Nancy in integrating the use of UMChat and enhancing her course materials with the use of Moodle and/or WebCT. (Pam Gades).

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Ted Pappenfus**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: Chem 1101 – General Chemistry I (SCI-L)

Chem 2301 – Organic Chemistry I (SCI)

Number of Students Impacted by Course seventy; seventy-five

Student Learning/Teaching Issue: **Student Response System**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: Fall, 2006

Course Description: *(Please provide the course overview that appears in course bulletins)*

From course bulletin

CHEM 1101 - General Chemistry I (SCI-L)

(4.0 cr; Prereq-Math 0901 or placement beyond Math 0901 using ACT/placement exam score; fall, every year)

Scientific method, measurements, nomenclature, stoichiometry, atomic and molecular structure, chemical periodicity and properties of common elements and ions. Development of scientific reasoning and problem-solving skills. Laboratory exercise concomitant with these topics. (3 hrs lect, 3 hrs lab)

CHEM 2301 - Organic Chemistry I (SCI)

(4.0 cr; Prereq-1102, coreq 2311; fall, every year)

Introduction to the structure and reactivity of organic molecules; nomenclature and functional groups; stereochemistry; mechanisms of substitution and elimination pathways; physical organic chemistry; introduction to synthetic strategy; fundamentals of spectroscopic techniques. (4 hrs lect)

Description of Research Project: *(Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)*

I would like to incorporate the use of personal response systems in my general chemistry course. A common complaint students have in the course is the lack of interaction between student and instructor. Adding this new technology to the course may help to alleviate the deficiency.

Activities/Work completed:

- (8/1/06) Attended a demonstration of E-Instruction PRS system on July 10, 2006 (with Greg Thorson). Viewed a demo of TurningPoint PRS system on July 21, 2006 (with Molly Jo Kloek).
- (7/10/06) Looked at some preliminary information related to Xythos software (data managing system). Reviewed information related to personal response systems. Attended assessment workshop on 6-20-06.
- (5/31/06) Met with faculty, staff and students to draft a project plan on Tues., May 31, 2006. Present were: Nancy Carpenter, Jimmy Schryver, Kristin Lamberty, Pam Gades, and Brady Alsaker

Scholarly approach:

The approach involves collaborative efforts between faculty interested in similar/related technologies. This approach should prove effective as there is a desire for uniformity across campus. This should encourage interaction between faculty and will place less of a burden upon support staff.

Successes/Challenges encountered:

- (8/1/06) Narrowed down the PRS systems to e-instruction, interwrite and i-clicker (due to Mac/PC capabilities).
- (8/1/06) Haven't been able to test the I-clicker system. It sounds like an attractive system and had hoped to have tested it by this time
- (7/10/06) Obtained preliminary information on Xythos. Actually tested a personal response system (CPS RF model...eInstruction).
- (7/10/06) Getting faculty together to meet has been a challenge as most faculty have unique schedules in the summer.
- (5/31/06) A project plan was drafted and completed.
- (5/31/06) No noteworthy challenges yet to report.

Assessment/Evaluation of the project:

Once the technology is implemented, one method of assessment will be to place the personal response systems into one of two general chemistry lecture sections. The effectiveness of the technology will be gauged by a comparison of student performance in each of the two sections. Appropriate measures will be taken by the faculty to ensure an accurate assessment of student performance.

Feedback received:

- (8/1/06) N/A
- (7/10/06) My two summer students are encouraged by our efforts to explore the use of Xythos and personal response systems in our chemistry courses.
- (5/31/06) Pam and Kristin have offered good suggestions for achieving project goals.

Feedback from the TEL Office:

The TEL office located a number of resources on PRS and Moodle for this project. We have also demonstrated the use of two PRS systems for Ted. The progress of this project seemed to be in-line with the project planner.

Feedback from consulting group:

- Dr. Pappenfus seemed to have things under control for this project. I would be curious to find out how easily the data from Xythos can be integrated with the PRS, and which PRS he ended up using.
- We are still going to have two evaluation systems delivered to UMM for demo and practice. One from iClicker, one from GTO-Calcomp (InterWrite PRS). This is being arranged by Media Services and Computing Services. The barrier to purchasing a system is mainly that whatever system is chosen needs to be a campus decision. We are hoping that we can make the decision and have a system purchased by the end of Fall semester. (Pam Gades)

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Jeffrey Ratliff-Crain**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: **Psyc 1051 & 1081 (primarily); other UMM intro.-level courses**

Number of Students Impacted by Course Psyc 1051 = 150 students; Psy 1081 = 100 per year

Student Learning/Teaching Issue: **Addition of a Learning Styles Assessment to Existing Online Interactive Study Guide**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: SSI '07 (Psyc 1081 online)

Course Description: *(Please provide the course overview that appears in course bulletins)*

From course bulletin

PSY 1051 - Introduction to Psychology (SS)

(4.0 cr; fall, spring, every year)

An introduction to the science of mind and behavior. Topics include history of psychology, research methods, biological bases for behavior, life span development, sensation and perception, learning, cognitive and social processes, personality, psychopathology, and applications of psychology. Includes laboratory/discussion sessions.

PSY 1081 - Drugs and Human Behavior (SS)

(2.0 cr; spring, every year)

Survey of psychoactive drugs, their effects on mind and behavior, and prevention and treatment of drug abuse.

Description of Research Project: *(Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)*

As a continuation of the work Katherine Klopfleisch and I have been doing with regard to assisting students to develop learning skills, the inclusion of a learning styles assessment and the possibility for making our existing web-based supplement more effective is intriguing. I would like to use this opportunity to explore ways to better assess student learning needs and work to match our advice to their needs. Using technology to allow for varied means of delivering this information and advice is a logical next step.

Activities/Work completed:

- (8/1/06) Trent Wold has completed a prototype, php-run, survey page that will serve as the core interactive piece for the revised 'study tips' web page. His work this month on learning php and setting up this page has been a great help!
- (7/5/06) Have met with Nic to discuss project's goals and set a workable plan of action; * Had set time to meet with student to get project going, but needed to reschedule (will meet with tomorrow (July 6)). Student (Trent) has been learning how to do php programming for interactive web page. * In process of breaking issues covered in skills web page into factors and developing questions for students to self-test and the information that each connects to. This last will be the feedback generated to students.

Scholarly approach:

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Successes/Challenges encountered:

- (8/1/06) Kudos to Trent for his work. We met a couple times this month to discuss direction, formatting, and how results may be used, but the real leg work was done by him. This is exactly the piece that was needed.
- (8/1/06) Some bumps related to getting web materials on/off the server because of the crash earlier this summer, but nothing with the project itself. Progressing nicely.
- (7/5/06) Overall, I am satisfied with the progress. I need to review last term's evaluations for modifications for next year's administrations.

Assessment/Evaluation of the project:

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Feedback received:

- (8/1/06) NA
- (7/5/06) Very positive. Students enjoyed using the clickers and getting credit for their daily work.

Feedback from the TEL Office:

- We created a PHP web survey that points users to appropriate parts of the online study guide. This survey includes all the functionality requested in the last meeting and seems to be finished. The progress of this project seemed to be in-line with the project planner.

Feedback from consulting group:

- Jeff worked with one primary member of the consulting group to get his project off the ground. The goals of Jeff's project fit well with the overarching goal of the Bush grant for the UMM campus. We look forward to seeing how the php survey enhances the learning of students in the courses.

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Tammy Berberi, Viktor Berberi**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: French language sequence Fren 1001-1002; Italian 1301-1302

Number of Students Impacted by Course Twenty-five

Student Learning/Teaching Issue: **Creating Associative Learning Tools for French and Italian Courses**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: Fall, 2006

Course Description: *(Please provide the course overview that appears in course bulletins)*

From course bulletin

FREN 1001 - Beginning French I (FL)

(4.0 cr; fall, every year)

An introduction to oral and written French, its basic structure, and to French culture.

FREN 1002 - Beginning French II (FL)

(4.0 cr; Prereq-1001 or placement or #; spring, every year)

Continuation of 1001.

ITAL 1301 - CE: Beginning Italian I (FL)

(4.0 cr; fall, every year)

Introduction to Italian as it is presently spoken and written. Basic sounds, structures, and vocabulary of Italian. Understanding, reading, and writing the language and communicating in Italian about everyday situations. Relationship between culture and language.

ITAL 1302 - CE: Beginning Italian II (FL)

(4.0 cr; Prereq-1301 or placement or #; spring, every year)

Continuation of 1301

Description of Research Project: (Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)

What does it mean to complete the FL requirement at UMM? Are we trying to help them acquire and retain culture, language, or both? In a two year requirement (which is the acknowledged standard) proficiency in both language and culture can be achieved. Yet the implied time bind of the one-year requirement puts these goals at odds with one another. Inevitably, the best intentions to cover both fields falter in the face of a vast majority of students who just want to do the bare minimum to finish. Although associative materials such as CD-ROMs are available as ancillaries to the textbook, a student who lacks motivation may never investigate materials to the extent that these become useful to him/her. Every component of a text package should engage multiple ways of learning at every stage of learning.

Research indicates that a student who arrives at college without basic foreign language skills will struggle far more to acquire them than would a younger student. Learning difficulties coupled with American Isolationist rhetoric and the enduring notion that languages are “impractical” combine to convince students that languages are a waste of time and that they “can’t” learn them. Tammy and Viktor seek to develop materials that capitalize on associate learning strategies rather than the linear strategies used in a traditional print textbook. This will enable students whose low level of proficiency at this late stage in their academic career indicates a lack of interest in foreign language or learning issues. These materials will condition them to engage multiple strategies in acquiring and mastering a particular concept and move them more quickly to synthesize concepts for better retention.

Activities/Work completed:

We have worked on developing a scholarly approach as articulated in *_Worlds Apart: Disability and Foreign Language Learning_*, which Tammy completed this summer and has under contract with Yale UP. Tammy has given a presentation on language learning and Universal Design to some 40 faculty members at TAFS on Oct 5, 2006, and to another group at the Faculty Retreat in Aug 2006.

We have researched the WebQuest format and developed ideas for syllabi with more coherent incentive components, based on the Tour de France and Paris-Dakar races (for the French sequence), and on the Giro d’Italia (for the Italian sequence).

Scholarly approach:

Our scholarly approach is based on Universal Design for Learning with an emphasis on technology. We are preempting the implementation in higher education of NIMAS (the National Instructional Materials Accessibility Standard, currently in effect for K-12), which mandates the availability of alternate-format versions of instructional materials.

Successes/Challenges encountered:

Our great challenge was to make progress on our project in the face of significant additional, unforeseen commitments: this year, Viktor has taken on a 40% teaching overload, while Tammy is serving as the only stable faculty member in French, which will mean additional discipline duties, including serving on the French search committee. In addition, Tammy has had her book manuscript to finish over the past summer. Both Tammy and Viktor are organizing summer study-abroad sessions: July in Paris and a May session in Rome. Our schedule has forced us to revise the timeline for the completion of our project (see below).

Assessment/Evaluation of the project:

New timeline: we will finish developing materials over the 2006-07 academic year and implement and assess the materials in FREN 1001/1002 and ITAL 1301/1302 in 2007-08.

Feedback received:

None

Feedback from the TEL Office:

2. The TEL office has invested significant amounts of time in locating web resources for this project. These resources include: Croquet links, articles on Flash, links to video/audio/interactive websites, and numerous links to be used on a French WebQuest. One student worker created some examples of Flash resources.
3. They were in contact with the office for much of the summer.

Feedback from consulting group:

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Bert Ahern**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: **History 1102 – Introduction to World History since 1500; carryover into History 3251 and 3451**

Number of Students Impacted by Course sixty to seventy in 1102;
35-40 in the other two

Student Learning/Teaching Issue: **Framing Hist 1102 Introduction to World History since 1500**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: Spring, 2007

Course Description: *(Please provide the course overview that appears in course bulletins)*

From course bulletin

HIST 1102 - Introduction to World History Since 1500 (HIST)

(4.0 cr; spring, every year)

Methods, themes, and problems in the study of world history since 1500.

HIST 3251 - American Indians and the United States: A History (HDIV)

(4.0 cr; not offered 2006-07; spring, every year)

The experience of the original Americans and their interaction with later immigrants.

HIST 3451 - Facing West (HDIV)

(4.0 cr; not offered 2005-06; fall, every year)

History of the American West. What is the West to the United States? Examination of the meaning of the West as both place and process for U.S. history; exploring the distinctive role that the West has played in the development of the United States from 1790 to the 21st century. Special emphasis on the interplay between different peoples in the vast and varied region.

Description of Research Project: (Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)

I will be teaching Hist 1102 for the first time under semesters in spring 2007. I last taught the course in spring 1998, when it covered only 1850 to the Present and I was not yet familiar with web-based instructional opportunities. My limited use of web-based instructional technology in other courses [WebCT for threaded discussions and access to instructional resources [lecture notes, reference materials]; PowerPoint for lectures and some use of on-line resources in class presentations or as supplemental resources] makes me eager to address some opportunities that IT provides to reach the diverse needs of the students enrolled.

- Enabling interaction between me and the students both in-class perhaps through PRS and out-of-class through threaded discussions – especially important for a large-enrollment course so that I can gain a sense of how all students are learning

- Encouraging student interaction over the course material so that they can learn from each other – threaded discussions do this but also I would like to incorporate student projects that can be shared with other students and beyond the class

- Providing more frequent feedback to students of their progress – e.g., on-line quizzes to establish understanding of lectures and course readings; study guides

- Identifying appropriate on-line resources – e.g., maps, primary sources, photos/paintings; video and audio clips – and determining how to use them whether in class sessions or for student access outside of class

- Designing a course website that is accessible and responsive to diverse learning styles

- Relevant results of this project will be available to other instructors of this course – I will be seeking advice from them as well as sharing my work with them.

Activities/Work completed:

1. Reflected further on a series of SOTL essays concerning beginning history courses and internet resources. These underscored the importance of assessment and offered some good ideas. They also will help me organize a discussion among my colleagues who share instructional responsibility for the course. 2. Met with my support team (Michelle, Karen and Kristin) to consult about accomplishments and directions for my work. 3. Participated in Assessment Workshop 4. Identified some assigned reading material for the course 5. Initial exposure to Moodle and PRS
2. 10/06 Since my last report, I have continued to explore some instructional technology features that I can incorporate in Hist. 1102 next semester.
 - a. This semester I am using Moodle for both of my courses. While both of these courses are upper-division and more discussion based than is Hist 1102, they involve threaded discussion and posting of content and communications that will be relevant to my practice next semester. I find Moodle to be much more accessible for me and for the students and will definitely use it rather than WebCT Vista in the next semester.
 - b. I have not moved very far on the PRS feature but still expect to use it to some extent, if it is available.
 - c. A recent presentation on Universal Design Instruction to improve accessibility to learning by disabled students brought www.cast.org to my attention and I expect to make use of it.
 - d. In the near future, I will be consulting with Michelle Page and Kristin Lamberty about approaches to assess the value of the changes that I will be making next semester.

Scholarly approach:

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Successes/Challenges encountered:

<ul style="list-style-type: none"> - 1. I have gained some sharper focus on the innovations on which to concentrate for this project 2. The Assessment workshop helped me clarify my assessment approach - which is to build on the Chickering and Gamson model and test for this. - 1. The UMM website problems have slowed my exposure to Moodle but I expect to learn about it this month. 2. My slow-speed internet access from a distance has slowed my use of some of the on-line resources - 10/06 since mid-August I have achieved some competency using Moodle and have explored some additional tools to expand my attention to diverse learning styles and situations.
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Assessment/Evaluation of the project:

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Feedback received:

<p>1. Again I am an early stage of the project. The session with my support team was helpful. I have also had one open-ended discussion about the needs for the course with another instructor of the course.</p>

Feedback from the TEL Office:

<p>1. Based off of Bert's project's planning sheet, the TEL office located a number of resources on PRS and Moodle for Bert. 2. There was never any official communication between Bert and the TEL office, so no further work had been done on this project.</p>

Feedback from consulting group:

<ul style="list-style-type: none"> - Dr. Ahern contacted Michelle and me (Kristin) with questions about using Moodle forums for threaded discussion versus using a wiki. He seemed interested in weighing the benefits and drawbacks of the different technologies. He seemed receptive to the idea of keeping in touch throughout his ongoing preparation and once the course is actually underway if any more questions should arise. - Bert's project is complex and he is trying to take into account very important areas such as an assessment system to be incorporated into his teaching that appropriately merges with the teaching tools in use (technological and otherwise). The consulting group would be happy to meet with Bert this academic year to support his continued knowledge and growth about Moodle and other potential tools that he will use in the spring offering of the course. We have confidence that despite some obstacles that have slowed the project overall (discussed above), Bert will be able to significantly rework several courses as a result of this project. - On Wednesday, May 31, Michelle Page, Kristin Lamberty, and I met with Bert Ahern about his Bush Grant project for 2005-2006. Bert talked with us about possibly including online journals, quizzes, and threaded discussion in his project, and at that time was leaning toward the use of Moodle as a content management system. We also discussed having a balance of online materials (maps, other audio and visual resources to address multiple learning styles), as well as using personal response systems in the classroom. Bert participated in the Assessment Workshop offered by the Consulting Group on June 20, 2006. ~ Karen C.
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**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Byungik Kahng**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: Math 1101 - Calculus I (M/SR)

Math 1102 - Calculus II (M/SR)

Math 1021 - Survey of Calculus (M/SR)

Number of Students Impacted by Course 150, 50, 10, respectively each year (estimated).

Student Learning/Teaching Issue: **Developing Mathematica modules for UMM
Calculus Courses**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: **Spring 2006 (for Math 1101 only).**

Course Description: (Please provide the course overview that appears in course bulletins)

From course bulletin

MATH 1101 - Calculus I (M/SR)

(5.0 cr; Prereq-high school higher algebra, geometry, trigonometry or 1011; fall, spring, every year)

Limits and continuity; the concepts, properties, and some techniques of differentiation, antidifferentiation, and definite integration and their connection by the Fundamental Theorem. Partial differentiation. Some applications. Students learn the basics of a computer algebra system.

MATH 1102 - Calculus II (M/SR)

(5.0 cr; Prereq-1101; fall, spring, every year)

Techniques of integration. Further applications involving mathematical modeling and solution of simple differential equations. Taylor's Theorem. Limits of sequences. Use and theory of convergence of power series. Students use a computer algebra system.

MATH 1021 - Survey of Calculus (M/SR)

(4.0 cr; Prereq-high school higher algebra, geometry or 1011; fall, every year)

Short course for students in social sciences, biological sciences, and other areas requiring a minimal amount of calculus. Topics include basic concepts of functions, derivatives and integrals, exponential and logarithmic functions, maxima and minima, partial derivatives; applications

Description of Research Project: (Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)

The title of my project is "Developing *Mathematica* modules for UMM Calculus courses". This project is a continuation from the Bush-TEL project that I engaged in 2005-2006 academic year, with the generous support from Bush foundation and UM-TEL. The preliminary versions of Calculus I modules were finished before the beginning of fall 2005 semester and I was able to run the first pilot program in the fall 2005 semester. Although there are still some more revisions to be done during the winter of 2005 – 2006, most of the primary goals of this project had been successfully met. Through computer modeling and visualization, I was able to satisfy the students with diverse learning styles in the same class. Mathematics, traditionally, is not known as a subject with realistic applications. The computer modules helped the students to deal with more realistic applications than any problems and projects in textbooks. *Mathematica* is very difficult software to learn, because it requires a good deal of both computer programming and mathematics. Not all the students achieved the desired level that they can start using and learning *Mathematica* on their own. It will take one more semester (Calculus II) even for talented students, and still more (Calculus III as well) for majority of the students. This, among others, necessitates the continuation of this project.

I am scheduled to teach Calculus I again in the spring of 2006. This will be a good opportunity to incorporate the revised, stable versions of the modules. Also, being scheduled to teach Calculus II in the fall of 2007, I am in an ideal position to continue this project and create Calculus II modules over the summer of 2007. With the support from Bush foundation, I hope I can duplicate the success of my Calculus I modules in Calculus II project, too. My Calculus I project is being funded by UM-TEL, too, but it is difficult to tell if I could get their support for Calculus II project as well. (The call for the proposals did not come out yet.) At this moment, therefore, I am counting only on Bush foundation for the continuation of my project. The Calculus III project will be far bigger than the previous two combined, and I plan to apply for an external grant (such as NSF CCLI). Hopefully, I could get enough intermediate results from my Calculus I and Calculus II projects, which will enable me to apply for the external grant

Activities/Work completed:

(8/9/06)The first two chapters of Calculus II notebooks (out of 4) are completed. Calculus notebooks are constantly being revised.

Scholarly approach:

Successes/Challenges encountered:

- (8/9/06)The biggest success I had was to give students realistic and challenging projects that requires substantial amount of time outside class. Too many students were settling with lower grade not spending enough time outside class before.
- (8/9/06)Undergraduate teaching assistants had trouble helping and leading the students. Also, a lot of students did not utilize the TA's and claimed they were not aware, even though I announced it very often (almost weekly) in class.

Assessment/Evaluation of the project:

Feedback received:

- (8/9/06)More than one colleagues are either using some of my modules or planning to use them in their classes.

Feedback from the TEL Office:

1. Byungik was neither in contact with the office in any way (email, reflection logs, or otherwise), nor did he ask for any help with his project from the office.

Feedback from consulting group:

We met as a consultative group (Karen, Nic, and I) with Byungik on May 31st to discuss his project plans and the progress of his project. We asked Byungik to explain the work he was undertaking this year as it related to the work of the past year. He demonstrated how the modules work. We asked Byungik to consider how he might assess the effectiveness of his work using the new Mathematica modules in terms of student learning. Suggestions were given as to questions he might consider asking on the survey he planned to give students. He indicated he wanted more useful data than had been collected the previous year. A rubric was also suggested for use in assessing student progress on the Mathematica project. Byungik was encouraged to share his work with other professors in the math department for purposes of informing, collaborating, and receiving feedback.

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Jimmy Schryver**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: **All of the courses in the Art History discipline will be effected**

Number of Students Impacted by Course 1000 –level: 50 students 3000-level:15 students

Student Learning/Teaching Issue: **Art History Image Library**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: Fall 2007

Course Description: *(Please provide the course overview that appears in course bulletins)*

From course bulletin

ARTH 1101 - Principles of Art (FA)

(4.0 cr; fall, spring, every year)

An introduction to the theories, methods, and vocabulary of art history. Involves development of basic skills of research and of analysis and interpretation of individual works of art. Helps the student to understand the intrinsic as well as the historical-cultural meanings of works of art.

ARTH 1111 - Ancient to Medieval Art (FA)

(4.0 cr; fall)

Origins of art in the Paleolithic period; survey of monuments of ancient Mesopotamia, Egypt, Greece, and Rome as well as the Early Christian, Romanesque, and Gothic styles of western Europe. Also treatment of non-western traditions in ancient and medieval periods.

ARTH 1121 - Renaissance to Modern Art (FA)

(4.0 cr; spring, every year)

Survey of the major works of art of western Europe from 1400 to the present.

ARTH 3101 - Art and Archaeology of Ancient Greece (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; fall, spring)

Beginning with the Bronze Age civilization of the Aegean, Minoan, Cycladic, and Mycenaean, this course follows the development of painting, sculpture, and architecture of ancient Greece, concentrating on the classical period in Athens and the Hellenistic period in the Mediterranean.

ARTH 3111 - Art and Archaeology of Ancient Rome (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; spring, odd years)

The Etruscan civilization in central Italy originating in the 7th century B.C.E. initiates the study of the development of Roman painting, sculpture, and architecture with concentration on the Imperial period of ancient Rome to the 4th century C.E.

ARTH 3112 - Art and the Byzantine Empire (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; offered every other yr; fall, even years)
A chronological and socio-political exploration of the development of art within the Byzantine Empire. The various roles that this art took within and beyond the borders of Byzantium.

ARTH 3113 - Islamic Art and Culture (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; offered every other yr; spring, odd years)
An investigation of Islamic art and architecture in both the secular and religious realm. Examination of these works in the context of the cultures and historical periods that produced them. Begins with the birth of Islamic art and continues up until today.

Effective: Spring 2007

ARTH 3121 - Medieval Italian Art (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; spring, even years)
Painting, sculpture, and architecture of central Italy, notably Tuscany, from the 12th to 14th centuries, with attention to the influence of the mendicant monastic orders of the Franciscans and the Dominicans on the art of the period.

ARTH 3131 - Northern Renaissance Art (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; offered when feasible; fall, spring)
Painting, sculpture, and architecture of France, Belgium, the Netherlands, and Germany during the late 14th century to the mid-16th century, tracing the development of oil painting and interpreting the significant imagery of the period.

ARTH 3142 - Art of the Italian Renaissance, 1300-1520 (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2005-06; spring, odd years)
A variety of methods (including stylistic, gender, and contextual theories) are used to explore the painting and sculpture of such artists as Giotto, Donatello, Leonardo, Raphael, and Michelangelo.

ARTH 3161 - 16th-Century European Art (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; fall, odd years)
A study of art during a period of cultural upheaval and radical change in Italy and northern Europe from 1520 to 1590.

ARTH 3171 - Baroque Art (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; spring, even years)
A sociohistorical consideration of the stylistic and thematic diversity present in the works of such 17th-century masters as Caravaggio, Bernini, Velazquez, Rembrandt, and Vermeer.

ARTH 3181 - Rococo to Revolution (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; offered when feasible; fall, spring)
An examination of the visual arts in relation to social and historical developments in 18th-century Europe, such as the Enlightenment, the French Revolution, archaeological discoveries, the Grand Tour, and the rise of art criticism.

ARTH 3191 - American Art to 1900 (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; fall, odd years)
A thematic exploration of the role of painting, sculpture, and the decorative arts in American society, from colonial times to 1900. Topics include the landscape and Manifest Destiny, American icons, folk art, and the representation of Native Americans, African Americans, and women.

ARTH 3201 - 19th-Century European Art through Post-Impressionism (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; fall, odd years)
Survey of major movements from Neoclassicism through Romanticism, Realism, and Impressionism to Post-Impressionism. Attention is given to iconographical and formal analysis as

well as to the social conditions in which artists lived and worked.

ARTH 3211 - Early Modernist Art: Symbolism to Surrealism (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; spring, even years)
Survey of the major early modernist movements from Symbolism through Cubism, Futurism, Expressionism, Constructivism, De Stijl, and the Bauhaus to Surrealism. Attention is given to theories of modern art as well as to formal and iconographical analyses and to the social conditions in which modern art was created and experienced.

ARTH 3221 - 20th-Century Art: 1945 to the Present (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2005-06; fall, even years)
An examination of selected artists and movements from the 1940s through the present. Equal emphasis is given to the art and the social context in which it was made and experienced, and to modernist and postmodernist aesthetic and critical thought.

ARTH 3231 - History of Photography (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2006-07; spring, even years)
Survey of European and American photography from the period of invention to the present. Major artists and movements are examined in the context of a variety of aesthetic, social, and technical issues.

ARTH 3241 - African American Art (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2005-06; spring, odd years)
Survey of African American art from colonial times to the present, focusing on social context and aesthetic and biographical issues.

ARTH 3261 - Chinese Art (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2005-06; fall, even years)
Survey of Chinese arts from the Neolithic times to the 20th century, presented in the context of Chinese culture.

ARTH 3281 - Women and Art (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; not offered 2005-06; fall, even years)
A historical survey of women's roles as creators and patrons of the visual arts in Western European and American societies, from antiquity to the present.

ARTH 3291 - Facing the Past: Portraiture and Social History (FA)

(4.0 cr; Prereq-any 1xxx Arth course or jr status or #; fall, spring)
This seminar examines functions and formats of portraits created primarily in Western Europe between 1400-1800, in order to gain greater insight as to how various social identities (such as that of husband and wife, child, friend, and freak of nature) were visually constructed and verbally interpreted.

ARTH 3311 - CE: Italian Renaissance and Baroque Art in Context

(1.0 cr; spring)
An opportunity to view and interpret art of the Renaissance and Baroque periods (c. 1400-1700) in its original contexts in Italy and to better comprehend how powerfully art can affect a viewer.

ARTH 3993 - Directed Study

(1.0 - 5.0 cr [max 10.0 cr]; Prereq-any 1xxx Arth class or jr status, approved directed study form; fall, spring, every year)
Content and nature of the course to be determined by faculty and student consultation. May include individual research and writing, working in relation to the Art Gallery program, or travel and study.

ARTH 4901 - Capstone Assessment of Student Experience in Art History

(1.0 cr; Prereq-Arth major, #; S-N or Aud, fall, spring, every year)

Allows students majoring in art history to reflect on the connections among the different courses and experiences they have had in the discipline by compiling a portfolio of their work, writing a short paper, and discussing their experiences with the faculty and other majors.

ARTH 4993 - Directed Study

(1.0 - 5.0 cr [max 10.0 cr]; Prereq-any 1xxx Arth class or jr status, approved directed study form; fall, spring, every year)

Content and nature of the course to be determined by faculty and student consultation. May include individual research and writing, working in relation to the Art Gallery program, or travel and study.

Description of Research Project: (Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)

Art history necessarily addresses visual and verbal learning styles. In fact, one of the major skills we teach is to link the visual to the verbal. To do so, and indeed to teach art history at all, we must have an up-to-date and extensive image library so that students can see a rich variety of art and related images (such as photographs showing art in context, maps, portraits of artists, pictures of unusual art materials, photographs of locations artists have painted, etc.). The art history discipline has an extensive slide library for these purposes, but shifts in the photography industry are mandating that we change to a digital image database. We are applying for the Bush grant to fund the creation of such a database. The first step in this process will be the scanning of the images to be stored within from books and from the current slide collection. Our goal is to create a database that can be used by faculty and students in class, and used by students outside of class for various projects. In the end, such a database will be much more versatile and cost-effective than slides, allowing students to access images independently for study and research, something they cannot now do easily with the slide library.

Activities/Work completed:

- (12/6/06) I have ordered PRS units for my Spring '06 class and will be implementing this technology on a trial basis throughout the semester.
- (8/7/06) We have now compiled a list of the other schools using MDID in order to look at their approach to its use and to make sure there are no other problems waiting for us that we have not yet encountered.
- (7/20/06) We have set up the local test server and have made a dry run through the steps of loading pictures and associated metadata. This has allowed us to identify and address problem areas.
- (5/31/06) Things have gotten off to a running start. We have downloaded the MDID demo and had a run through it with the students to assess some preliminary issues that might become challenges. I compiled these and gave them to the UMMtel group as a word doc. This will function as a running list of issues to tackle. Otherwise, I provided the group with a list of fields that we will need to isolate or program into the database. I also drew up a list of file types and scanning instructions for the group. I handed over a number of CD Roms with about 300 images to the students for loading into the database. I attended a meeting of the clicker group to explore this possibility. I attended a group meeting with my core group to assess progress at this stage and brainstorm ideas for the next stages of the project. We were able to identify and solve problems associated with the loading of images and the attachment of metadata to these images in the database. This in turn has helped us to refine our scanning procedure.

Scholarly approach:

Successes/Challenges encountered:

- (10/6/06) We have now run into the challenge that although the database is ready to receive images, this can currently only be done at the expense of other essential duties that our work-study student is engaged in. This is due to the amount of information that we want to add to each entry in the database and the need to check both image quality and information accuracy in terms of things such as dates (which we can enter only as numbers and then must edit to add BC or AD, for example). Barring the receipt of funds dedicated to image importation, this now looks as though it will be a longer process than we had originally envisioned.
- (8/7/06) The database is ready to receive images and the list of other users has proven quite helpful.
- (7/20/06) We were able to identify and solve problems associated with the loading of images and the attachment of metadata to these images in the database. This in turn has helped us to refine our scanning procedure.
- (7/20/06) Luckily, the problems that we encountered with the association of metadata to image within the database were easily solved.
- (5/3/06) We are just about to get the test version of MDID up and running. I have gotten jabber enabled on the computer in my office, which has allowed high speed, real time exchanges with the UMMtel group concerning project needs and questions. My core group meeting was very helpful regarding ideas for assessment and ways that I might try to integrate the database more into classroom and homework assignments. This meeting was also very helpful regarding the ways in which we might allow student access to the database while keeping it "private" to the UMM community.
- (5/31/06) So far, we have met and overcome all of the challenges encountered.

Assessment/Evaluation of the project:

- This will prove difficult at first because the process involved in importing and testing the images for quality can currently only be accomplished at the expense of the other tasks assigned to our work-study student at present. However, once a critical mass of images has been imported and are available to students, we intend to integrate evaluation into our course evaluation processes.

Feedback received:

- (8/7/06) I have found that a number of other institutions have similar approaches to the use of the MDID database.
- (7/20/06) Pending

Feedback from the TEL Office:

1. We created a test installation of MDID on a temporary server and provided resources for the management of this server. The TEL office looked into a permanent place for MDID with computing services and created instructions for adding images to the database. With the exception of the permanence of the MDID server, the progress of this progress seemed to be in-line with the project planner.
2. He was in contact with the office for most of the beginning of summer.

Feedback from consulting group:

- The consultative group (Pam, Nic, and Karen) met with Jimmy on May 30th to discuss his project plans and offer assistance. Trent was also present to discuss work on the database.

The software (Mdid) used to create the database for Art History slides and Content DM for images and archival purposes were discussed. Use of Excel spreadsheets for batch loading images and uploading to the file folder as well as Graphic Converter (for the Mac) for converting graphics to other forms and sizes were also discussed. In addition to discussing how images could be saved, stored, and retrieved by students

for the course, we also considered tools for assessing student learning as a result of using the digital images. Jimmy was encouraged to think about success of the project as more than just use of the images by professors and students, and move to some form of data collection that would document student learning. Benefits of using rubrics and surveys to assess student learning were discussed.

Jimmy also indicated interest in exploring use of clickers sometime in the future for the purposes of engaging students in the learning process.

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Greg Thorson**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM

Course Name: **Pol 4221 - Judicial Politics (SS)**

Pol 1201 - American Government and Politics (E/CR)

Pol 3232 Constitutional Law: Governmental Powers and Constraints (SS)

Number of Students Impacted by Course Seventeen, fifty-five, thirty-five

Student Learning/Teaching Issue: **Student Response System**

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: Fall, 2006

Course Description: *(Please provide the course overview that appears in course bulletins)*

From course bulletin

POL 4221 - Judicial Politics (SS)

(4.0 cr; Prereq-1201 or #; Stat 1601 or Stat 2601 recommended; not offered 2006-07; fall, every year)

Role of judges, police, attorneys, and interest groups within the political system, with analysis focusing on each as political actors. Areas of discretion in the legal system. Extra-legal predictors of judicial decision making and certiorari voting.

POL 1201 - American Government and Politics (E/CR)

(4.0 cr; fall, spring, every year)

Analysis of principles, organization, procedures, and powers of government in the United States. The federal system, national constitution, civil and political rights, party system; nature, structure, powers, and procedures of legislative, executive, and judicial departments of the national government.

POL 3232 - Constitutional Law: Governmental Powers and Constraints (SS)

(4.0 cr; Prereq-1201 or #; not offered 2005-06; spring)

Examination of major Supreme Court opinions in the areas of congressional, executive, and judicial authority; nation-state relations, and economic liberties. Topics include substantive vs. procedural due process, the Takings Clause, the contract clause, and the powers to tax and spend.

Description of Research Project: (Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)

I would like to work on integrating student response systems into my classes. I will need training on the use of such devices, as well as assistance in developing policies regarding their use.

The device that I intend to use can be found at:

<http://www.einstruction.com/>

The use of student response system has the potential to reward students for daily effort rather than through exams. This can be a significant benefit to students who suffer for test anxiety. It will also serve to reward students who have difficulty speaking in class but nevertheless prepare daily for class.

The use of student response systems can also be helpful for the instructor. By administering frequent quizzes, the instructor has a better sense of student's understanding of material. Rather than simply relying on feedback from the most vocal students, the instructor will get timely feedback from students of all learning styles. The instructor can then respond to this feedback appropriately, either by reviewing the difficult material or moving on to a new topic.

Activities/Work completed:

- (7/25/06) Evaluated previous use of system. Conducted talk on its use.
- (7/5/06) I attended the Assessment workshop put on by the grant. I also downloaded and worked with the new version of the CPS software.
- (5/26/06) I have completed my first semester's use of SRS in the classroom. I have also researched a bit some of the improved technology that is available through eInstruction next year.

Scholarly approach:

Successes/Challenges encountered:

- (7/25/06) Stronger awareness of previous work.
- (7/25/06) Some difficult setting up new classes.
- (7/5/06) Overall, I am satisfied with the progress. I need to review last term's evaluations for modifications for next year's administrations.
- (7/5/06) None yet.
- (5/26/06) Although I have just "eyeballed" the assessment result, they appear very positive.
- (5/26/06) I need to expand the use of the SRS beyond simply the initial testing of students for attendance and pop quizzes.

Assessment/Evaluation of the project:

Feedback received:

- (7/25/06) Very positive
- (7/5/06) Very positive. Students enjoyed using the clickers and getting credit for their daily work.
- (5/26/06) That SRSs reward students who do daily work and show up for class. Students like the reward.

Feedback from the TEL Office:

3. The TEL office, working off of Greg's project planner, found a number of resources on PRS. The office also gave Greg a demo on a different PRS.
4. The progress of his project seemed to be in-line with the project planner.
5. He was in contact with the office for much of the summer.

Feedback from consulting group:

- Dr. Thorson seemed to have a grasp on how to use PRS by the time consulting began. He seemed to have concerns about which model would be best for students (which pricing/use model), and I wondered if he had any information about that he would like to share with others on campus. The talk he gave was extremely helpful in getting other faculty thinking about this technology and how it relates to the different learning styles of our students or ways to assess student understanding.
- Greg has been a leader at UMM in the use of student response systems. He has been a very willing presenter on SRS and has shared informational resources with everyone involved in the Bush Grant. I would like to see how Greg used materials researched by the TEL student consultants and whether any of those resources helped him regarding classroom policies and usage of the SRS . (Pam Gades)

**University of Minnesota
Bush Foundation Grant
Research Project Profiles**

Faculty Member or Instructor: **Pam Gades, Karen Cusey**

Number of people involved in course redesign team (e.g., teaching, specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational, Technology consultants) 4 students, 3 faculty, 2 professional staff (ITConsulting Group)

Campus: UMM (online course)

Course Name: Innovative Teaching with Technology (new prototype course for faculty)

Number of Students Impacted by Course no min. or max. enrollment

Student Learning/Teaching Issue: COURSE PROTOTYPE

If assessment of student learning or evaluation data was not collected this year, please indicate when this will occur: spring 2007

Course Description: (Please provide the course overview that appears in course bulletins)

Innovative Teaching with Technology is a new non-credit course with information about a variety of tools that can be used to promote elements of the Seven Principles of Effective Learning.

Description of Research Project: (Include specifics about your project such as your goals and objectives, the implementation timeline, etc.)

We will use the UMWiki as the course container and integrate many tools and examples -- closely tied to the seven principles of effective learning. Research appropriate readings to go along with the 7 principles. Pay attention to the technology adaptation paper regarding the 7 principles. Find also, research about the effect on student learning using various tools such as discussion boards, PRS (clickers) chat, blog, wiki, etc.

Activities/Work completed:

(10/2/06) Ideas for implementing the seven principles of effective learning through the use of technology for innovative teaching have been created by Pam Gades and Karen Cusey with much help from the student consultants, Molly, Brady, and Trent. Examples include a generic name for each tool suggested (email, discussion, etc.), advantages and applications for each tool, and specific brand name tools available at UMM (Webmail, WebCT Vista mail, Moodle Mail, Thunderbird mail).

The current version of this project can be found at:

<https://wiki.umn.edu/twiki/bin/view/InnovativeTeaching/WebHome>

Scholarly approach:

Researching relevant journal articles and online resources. Investigating what technologies are being used at other Universities to support innovative teaching and student engagement.

Successes/Challenges encountered:

Successes: A success while working with this project, was being able to find an abundance of easy to find relevant materials online. Another success would be the participation of the Bush Grant student consultants in helping to find resources and integrate information about those tools into the course wiki.

Challenges: Some tools identified would require user training and more development or customization. It is difficult due to time and personnel constraints. Some tools that could be utilized are not currently being supported at UMM.

Assessment/Evaluation of the project:

- Planned pre- and post-assessments will be included to evaluate faculty awareness of possible applications/tools for innovative use of technology in teaching.
- Pre-assessment will be self-paced as participants begin the course in late fall 2006.
- Post-assessment will also be self-paced, upon participants' completion of the course.

Feedback received:

We will begin soliciting feedback in Spring 2007.

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Kevin P. Smith, Mary Brakke

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) _____

Campus: Twin Cities

Course name: Agronomy 1101: Biology of Plant Food Systems and the Environment

Number of students impacted by course: _____

Course Description: *(Please provide the course overview that appears in course bulletins)*

This course is designed for students who are not in a life science program, but who wish to acquire a better understanding of biology as it relates to their lives. This course fulfills the University's CLE requirement for a biology course with lab. Using a problem-based learning approach, students will investigate fundamental concepts including the chemical basis of life, the nature of inheritance, and functions of ecosystems. Students will work in small groups to research problems related to food and nutrition, the use of gene technology in food systems, and environmental concerns arising from food production practices. Students will design and propose solutions to problems, present their analysis and participate in evaluation of proposed solutions. Hands-on investigations in the laboratory and a greenhouse project are designed to enhance students understanding of concepts, encourage intellectual curiosity and promote understanding of science as a process of learning. Course outcomes are knowledge of biological concepts, skills in complex problem analysis, and an appreciation for the role of science in society.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Professor Julia W. Robinson

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) 5

Campus: Twin Cities

Course name: ARCH 3711: Environmental Design and the Sociocultural Context

Number of students impacted by course: 150

Course Description: *(Please provide the course overview that appears in course bulletins)*

ARCH 37111 addresses how the built environment affects everyday life and how cultural perspectives affect the way environments are constructed. Students examine the responsibility of the design professional to the human community and its shared context—global, local, political and ethnic. The course also develops skills in studying written texts, environments and professional institutions from a cultural perspective. As it is a writing intensive class, students learn to write essays that identify important issues, take a position and make an argument using evidence

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

We are now addressing improved links between lecture and recitation classes, TA preparation, and improvement of assignment description. At the same time, we seek to build on our new understanding of those activities students seemed to have gotten the most out of.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

We will focus on evaluating the student appreciation of the recitations as learning experience, and further development of class exercises in lecture and recitation. We will also focus on TA development.

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

We continue to combine quantitative and qualitative approaches. We have reduced the number of written student evaluations during the semester and have added the use of focus groups in the form of the Student Advisory Committee.

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

Survey data suggests that the gap between instructor and student perspectives continues to shrink.

Students have increased understanding and appreciation of course content, especially the relation between the readings and the critical papers.

Students felt better prepared for assignments.

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

A scholarly approach to teaching means discovering what works in a particular situation by taking into account new ideas, methods and theories on teaching, using them to improve the presentation of material to students, and evaluating their success.

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Collaboration means the ability of a team to work together for a joint purpose, with all team members contributing their unique perspective, listening to others' views and jointly developing approaches to problems and identifying new opportunities that are identified. It is a continual loop of feedback from all parties involved (students, TAs, professor, consultants) that allows ideas be interpreted and implemented quickly & effectively.

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

Course is better structured and clearer. Students are understanding the course objectives better.(first week, midterm & final evaluations as well as focus group discussions)

Students are less frustrated, and overall attitudes are much better (experienced TA observations and comments on midterm and final evaluations regarding projects and critical papers)

Students are engaging in discussion more, and see the relation between readings and critical papers. Postings and discussion in class and recitation helps generate discussion. (midterm & final evaluations as well as focus group discussions)

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Sehoya Cotner, Bruce Fall, Sue Wick

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) _____

Campus: Twin Cities

Course name: Biology 1001

Number of students impacted by course: _____

Course Description: *(Please provide the course overview that appears in course bulletins)*

This course is intended for non-biology majors who need to satisfy CLE requirements for a biology course with lab and also for biology majors as the first course of a two-semester introductory biology sequence. This course covers general evolutionary and ecological principles, emphasizing biological diversity from genetic variation to the diversity of species and ecosystems. Topics include scientific inquiry, history of evolutionary thought, principles of genetics, the nature of variation, ecology of populations, behavioral ecology, human evolution, and genetic, evolutionary and ecological perspectives on issues concerning human diversity, human population growth, health, agriculture and conservation. Multimedia technology is integrated throughout the lecture and laboratory curriculum. Lecture will include various opportunities for active learning such as discussion of case studies, individual and group problem solving, and group work on sample exam questions. Laboratory is in a 2-hour block, designed to involve students in investigation, problem solving, and discovery. Students work in small groups with computer simulation programs and other activities involving living organisms. Computer exercises allow students to investigate principles of genetics, classification of organisms based on evolutionary relationships, evolutionary mechanisms, population ecology, and others.

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

No change: we still are concerned with engaging students better, increasing class attendance, increasing student preparation for class, and getting students actively involved with course material.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

Our research questions remain the same. In the sections of the course that our team members have offered since last May, we have used a variety of new interventions. Bruce (and co-instructor Mark Decker) used IFATs extensively during summer session, in addition to unannounced quizzes introduced last spring. This fall, a lecture section that historically enrolls up to 600 students was split into two smaller sections that have the same two instructors and identical laboratory experiences. The first section has text-based lecture, unannounced quizzes, two multiple-choice midterm exams, and one multiple-choice final. We consider it the “traditional lecture” or our so-called control group. The second section has structured group activities, extremely shortened lectures, unannounced quizzes, a few graded homework assignments, and the same multiple choice midterms and final as the first section. This is our experimental or “active learning” section.

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

The fall active learning section used a focus group of nine students led by one of our consultants, had some graded homework assignments in place of a few quizzes, and groups of students were randomly selected to come to the front of the class to present group results to the rest of the class. (This last technique was done in a more informal way last spring.)

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

- IFATs greatly increase student interest and involvement in class.
- Increased involvement and attendance over summer was reflected in higher final grades (higher proportion of A's and B's) than in typical previous offerings.
- Exam scores appear to be essentially identical in the active learning and traditional lecture sections taught by the same instructors.
- Students expressed opinions that group work helped eliminate the alienating feeling of being in a large lecture course.

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Sue Wick: I would like to leave my definition as is.

Bruce Fall: Taking a scholarly approach to teaching includes first recognizing and appreciating that there is a substantial (and growing) body of literature on how students learn and how to structure a class to better achieve the goals of improved student understanding, retention, and involvement. It includes the willingness to devote effort to become familiar with some of this research by regularly reading educational journal articles, attending meetings, workshops, etc., and to incorporate and apply some of these results into one's own classes. Finally, it also includes being a contributor to this body of knowledge by disseminating results from our classes (from designed experiments with controls if possible, as well as descriptions of techniques that we've tried, and outcomes) in education journals, workshops, and meetings.

Christina Yi: I think that a scholarly approach to teaching means that Professors use the knowledge they have about the subject and about the class to provide an adequate learning environment.

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Sue Wick: I would like to leave my definition as is.

Bruce Fall: Taking a collaborative approach to teaching includes discussions with instructors from different disciplines (e.g., as in our monthly Bush meetings) with the intent of comparing teaching techniques that may be of general applicability, and also discussions with colleagues from one's own discipline about techniques that may be more specific to ours. In the case of Biol. 1001, in addition to the two faculty and one staff member on the Bush team, there are at least five other instructors who teach or soon will teach this course. There is a good opportunity for lateral dissemination of ideas involving eight instructors for this one course. An informal meeting, or several, of all instructors for this course for the purpose of discussing pedagogy would be beneficial to all.

Christina Yi: I think that a collaborative approach to teaching means that professors use each other's resources and exchange ideas to enhance the learning experience in the class room.

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

Students are tracking course readings and in-class materials better, as indicated on the relatively high scores on unannounced quizzes. While some students do not enjoy active learning, several have been very appreciative of how these approaches have helped to capture their interest or helped them to understand course material better than if the instructor had just lectured the entire period. While increased attendance for its own sake is not our goal, there has been a tremendous increase in attendance once the quizzing mechanism was put into place; the positive side of this is that students may begin to recognize that regular class attendance is the expected norm (expected by the instructor, at least) and that learning the material or learning it more easily can result from being present and participating in class.

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Maria Gini

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) 2

Campus: Twin Cities

Course name: CSci 1901 – Structure of Computer Programming I

Number of students impacted by course: 126

Course Description: *(Please provide the course overview that appears in course bulletins)*

This is the first course for computer science major. The course does not assume any programming knowledge. Some familiarity with Unix is useful. The course teaches how to use a programming language as a formal way of expressing ideas. Strong emphasis is on recursion, data abstractions to hide program details, modularity to manage complexity. The programming language Scheme is taught as part of the course. In addition, the fundamental aspects of Python are presented to ease the transition to other programming languages.

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

No, the issues remain the same: how to engage students in a large class teaching material that is conceptually difficult.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

No, the project remained the same. In Spring 2007 we plan on repeating what we did in Spring 2006, i.e., short quizzes in preparation for the exams, more written homework, a lab using the Sony dogs AIBO to engage the students in a collaboration/competition activity, and a student management team. We plan adding one more lab with the AIBOs, and on adding a short lecture on using the career center for career planning.

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

No. In Spring 2006 we did 4 questionnaires during the semester. For Spring 2007 we are planning on doing 4-5 questionnaires. We are considering asking students to include their ID to the questionnaire to be able to track them individually.

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

Nothing new. The undergraduate member of the team, Kevin Wendt, is writing his honors thesis on the work done last Spring.

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Maria Gini, Instructor: -- leave as is
John Chilton, Graduate Assistant— leave as is

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Maria Gini, Instructor: - leave as is
John Chilton, Graduate Assistant – leave as is

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

Fewer students dropped the course and more did well in it, compared to the previous year.

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Virginia Zuiker

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) _____

Campus: Twin Cities

Course name: FSoS 3101: Personal and Family Finances

Number of students impacted by course: _____

Course Description: *(Please provide the course overview that appears in course bulletins)*

Analysis of personal and family financial management principles. Financial planning of savings; investments; credit; mortgage and taxation; life, disability, health, and property insurance; public, private pensions; and estate planning.

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Murray Jensen _____

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) 4

Campus: Twin Cities PsTL 1135: Human Anatomy and Physiology

Number of students impacted by course: _____ 100 students per semester

Course Description: (Please provide the course overview that appears in course bulletins)

PsTL 1135, Human Anatomy and Physiology, is a developmental education course intended for freshmen in General College. The course has three components: First, a traditional lecture where students are expected to take notes and take exams, second, a computer lab where students engage in cooperative quizzes and activities such as a "do something cool" project, and third, a laboratory component where students dissect eyes, brains, hearts, etc., and participate in many other hands-on activities. The course is organized around body systems, e.g., the skeletal system, the nervous system, etc., and focus on many common diseases such as diabetes, cancer, and atherosclerosis. All students enrolled in PsTL 1135 will be required to read at least one book, such as "When the Air Hits Your Brain," outside of regular class time. This course makes considerable use of Web Vista and a course internet site. Do not take this course if you do not enjoy using computers or if you do not have access to a fast and reliable internet connection. Please look up the GC 1135 website for more details: <http://msjensen.education.umn.edu/1135/>

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

General College has now been closed. We are in a period of transition as we are now a department (Post Secondary Teaching and Learning) in the College of Education and Human Development.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

Here are my two main research questions for the Bush program:

- Does students' use of games (the newly constructed "Anatomy Bowl") improve their understanding of anatomy as measured on test performance?
- Does the use of the Anatomy Bowl increase student engagement?

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

No – I still use the same:

Completed this semester: Course opinion surveys. Data analysis of exam scores. Data analysis of Vista quizzes. The course opinion surveys now reflect questions geared toward the Anatomy Bowl activity. Example: “Too unreliable to be used for grades at this point. I don't like working in groups because we can't go at our own pace. I do not know! Use it for bonus points in competitions. Can be used as part of a prep for a quiz. For instance, after studying web anatomy for a while... I would use the game as a break to test where I'm at and what I have to work on. It's something a little less repetitive from Web Anatomy, because you're racing against someone.”

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

I have not analyzed any new data. I have lots of data arriving at the end of this semester. (Course opinion survey, final exam scores, etc.)

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Murray Jensen, Instructor--Reviewing findings from articles and research and discussion to modify course curriculum to better accommodate student learning styles.

I have a new team member – new as of two weeks ago. I'm not going to have him fill this out – not enough background/experience with the project. Herb Struss – Graduate Student from CEHD

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

This is what I wrote last year – I'm still OK with this statement:

Murray Jensen, Instructor--What we're doing in the group actually happens in the classroom. It's not a dictatorship. The instructor of record uses the ideas from the group to modify course curriculum and instruction.

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

I'm trying to make the computer lab a fun and informal learning environment. We have many students making positive verbal expressions (YES! – All Right!) after completing The Anatomy Bowl. This is a great result. The game works well as a tool to make an enjoyable environment.

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Kent Kirkby

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) 2

Campus: Twin Cities

Course name: GEO 1001

Number of students impacted by course: 150-200 (lec) ~600 (labs) per semester

Course Description: *(Please provide the course overview that appears in course bulletins)*

The Earth we live on is a far more dynamic place than most people realize. It is constantly, if slowly, changing as major segments of the Earth's surface shift and grind against one another. This slow motion not only produces our world's many active earthquake regions, but over time, is also responsible for the uplift of mountain ranges and the changing shapes of the Earth's continental masses and ocean basins. These global-scale processes directly and indirectly created the environment we live in. Even on a smaller scale, our environment is constantly changing but on such a long time scale that few people recognize the very dynamic nature of our world. This course will explore how these global and regional-scale processes not only shape our world but also affect human society. One of the course's primary goals is to provide a better understanding of our planet in the context of current environmental issues and global change. Through lectures and labs, students can investigate how plate tectonics, volcanoes, earthquakes, wind, rivers, and glaciers sculpted our planet's landscape, and discover the many linkages between these processes and human society. GEO 1001 satisfies the Diversified Core Curriculum's requirements for both the environmental theme and as a physical science with lab. This course is designed for undergraduate students who are not geology majors and there are no prerequisites.

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

Our original specific tests changed significantly as early on we realized that (1) the anaglyph maps were far more effective in a lab setting; and that (2) much of the 'at-risk' population were at risk because of outside factors that could not be addressed within the course. However, our main goal of more effectively helping students to learn the many complex interactions between geological processes and human society has not changed. This is the information they need to become more informed citizens in an increasing global community. One of the most effective ways we have been able to do this is to emphasize historic interactions between human society and geologic processes. Although we were initially worried that students might not relate well to a historical approach, it has been remarkably effective.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

See above.

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

None since May, but we had already developed a fairly robust program of pre- and post-instruction assessment and have continued that program. Students would actually prefer that we spent less time assessing our course! Besides the in-class assessment, we have also continued our program of gauging students' understanding of maps and water flow processes as research project similar to those in Educational Psychology where students get extra credit for participating in out-of-class sessions.

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

- Over 96% of the students claim that the historical aspect of the course helps them to understand and enjoy the course material.
- We've continued to add to our list of recognized student misconceptions, including the (to us) staggering realization that over half of the students believe that 'north' and 'south' refer to up and down as well as horizontal directions. It was not staggering that they should think that, it was staggering that as instructors we never realized it!
- Targeted interventions that specifically target students' existing misconceptions provide the only means we have discovered to help lectures approach the effectiveness of lab instruction. Simply stating or showing the correct interpretation is not enough, you have to first refute existing misconceptions. Of course, this means that you first have to know what the misconceptions are!

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Alright, I'm going to complete these last two questions as a combined response, because both Amy and I independently arrived at the conclusion that they were the same question. A scholarly approach requires a collaborative approach. I couldn't imagine how you could separate the two and still achieve anything.

In the rush of preparing for a research conference and trip to Taiwan, Amy left without submitting her finished response for this one, but I am going off her notes and my own personal knowledge of her. Of the two of us, I hate to admit it but Amy is certainly taking the more scholarly approach in the traditional sense of incorporating education research articles into her work. She does well beyond the limited literature of Earth Science education to pull in articles and ideas from physics and chemistry (which have a longer history of education research) as well as educational psychology.

Amy still uses a practical scientific approach to education as well though. Her role in the team this

semester has been almost entirely on developing and running an UROP project to uncover and investigate students' misconceptions about water flow and how to best overcome those misconceptions. Despite her age, Amy's work is among the most advanced studies of student misconceptions in earth science. She is leaving the project to focus on her Masters this spring, so her departure will be a real loss! Perhaps her most important legacy in terms of the project though was the conscious recognition that one of the most important aspects to keep constantly in mind is that the students think about the Earth in very different terms than geologists do. It sounds simple, but relatively few instructors realize how important this recognition is. Without it, the barriers to effective instruction are almost insurmountable.

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

For myself, (see I was serious about answering these last two as one!), I still tend to be an experimentalist rather than a theorist in teaching. I am probably not clever enough to be the latter, so I prefer to simply try things in class to see if they work or fail miserably. The threat of failure adds a certain rush to teaching that helps to keep me focused!

Although I explore traditional collaborations with other faculty (in particular faculty in Curriculum and Instruction and Educational Psychology) my main innovation has been the simple realization that the most important collaborations involve the students themselves. As a group, students are among the best judges of what helps them to learn and I've tried to involve them in all aspects of the course design. They actually decide what lecture topics we will cover in the last half of the semester and their feedback on surveys and evaluations greatly help the course redesign.

This semester and next, I am also asking students to critique chapters from a new textbook that will come out next fall with those in their current text. The new book is actually an indirect outgrowth of the GEO 1001 program as it was designed about visualizations from our program. The authors though have come up with a very innovative design for the book that is quite different from traditional texts. So different that I am not sure whether it will work brilliantly, not work at all, or work in very different ways with different students. Since I have those concerns and since we have considerable pull with the publishers, I've gotten pre-publication drafts of chapters from the new book and am field testing them with students in the course. For extra credit, students fill out a minimum four page evaluation of the two texts and will decide the choice of textbook for next Fall's class. We're just getting the evaluations in, but so far the level of detail and insight in some of the evaluations is incredible. This spring, we will add workshops and small group discussions (with publishers and text authors) to this evaluation to more fully explore some of the student responses. For the moment, this is probably the best example of how I approach both research and collaboration in education!

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

The responses on quizzes get better every semester. The final is largely open-ended short answer questions that allow students to really show their level of understanding and I am very pleased with the results. My quizzes are geared towards application of concepts, not memorization, so they tend to be difficult for students. This semester, I have had many students go from struggling with the quizzes to excelling at them. So I was quite pleased with the class performance. On pre- and post-instruction surveys, this lecture section also consistently outperformed the other three lecture sections, so the innovations seem to have had a real impact.

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Professor Jole Shackelford

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) _____

Campus: Twin Cities

Course name: HMED 3001 (History of Medicine)

Number of students impacted by course: _____

Course Description: *(Please provide the course overview that appears in course bulletins)*

HMED 3001 is the first semester of a year-long survey course that covers the history of medicine in Western civilization from its earliest history into the 20th century. There are currently 6 sections of undergraduate students of mixed standing (HMED3001W), and also a section of freshman honors students (HMED3001V). Most students perceive themselves to be headed toward a health care related career. The course is a writing-intensive course with an emphasis on essential academic skills.

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty Member or instructor: _____ Kevin Upton _____

Number of people involved in course redesign team (e.g., teaching specialists, Graduate TAs, Undergrad TAs, technical support undergrads, Educational Technology consultants) _____
7 (counting a second instructor 6 Pas) _____

Campus: ___TC___

Course Name: ___MKTG 3001 Principles of Marketing_____

Number of Students Impacted by Course: 120/section for 2 sections. This is double the usual registration and reflects the College's intent to increase all core courses to more than 100 students.

Student Learning/Teaching Issue: how to enhance or at least maintain student satisfaction in a weeder course while increasing the enrollment count across all 30 sections per year.

Course Description: *(Please provide the course overview that appears in course bulletins)*

Introduction to terms, concepts and skills for analyzing marketing problems. Factors outside the organization affecting its product, pricing, promotion, and distribution decisions. Examples from actual organizations are used.

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed (see above), and, if so, how?

NO.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

Research focuses on staffing costs and staff/student ratios and the impact on student satisfaction and engagement. Can we increase class size without negatively impacting outcomes by utilizing Bush grant tactics/techniques? In Spring 06, two sections of the course were taught, with one section having 2PAs (undergraduate peer assistants) and one having 4PAs. In the next iteration, the pairing of PAs with instructors will flip.

In Fall 06 the number of PAs was switched. The data from the sections has been collected and will be analyzed in Spring 07.

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

[Data collection techniques]

Mixed methods quasi- experimental design. Data includes survey data from two treatment groups, costs of two vs. four peer assistants, self-evaluation of progress notes and meetings with team members about the teaching and learning process.

In addition, the same survey instrument will be administered in the other (smaller enrollment size) course sections. Surveys include SETs and student self-assessment of learning developed by the lead instructor.

The entire group (instructors and PAs) meets at least once each week to discuss the previous class experiences, to critique the learning process, and to suggest next steps.

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

1. Course observation was conducted by the evaluation consultant in the fall of 2006. Observation notes were written up and shared with the faculty member.
2. Consultants conducted a focus group in fall of 2006 with 5 out of the 6 peer assistants in this course regarding the roles and responsibilities of PAs, communication with faculty instructors, suggestions for improvement, and general observations about the benefits and challenges of the PA structure. These focus group notes were written up and shared with the faculty member.
3. We collected the student self-assessment of learning from the sections not covered by the grant and will analyze them this coming semester.

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Gaining knowledge from the experience of successful instructors. Collecting and trying best practices. Sharing experiences. Collaborating within the course team.

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Sharing ideas, listening to student feedback, acknowledging student feedback, being willing to adjust based on discussions and feedback, respecting each other and each other's roles.

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

No comment.

**University of Minnesota
Bush Foundation Grant
Course Profiles
Fall 2006**

Faculty member or instructor: Steven C. Huchendorf

Number of people involved in course redesign team (e.g., teaching specialists, graduate TAs, undergrad TAs, technical support undergrads, educational technology consultants) 5 people are on the course redesign team – Connie Tzenis, Valerie Ruhe, Faculty Member – S. Huchendorf, Graduate Assistant – Marco Habermann, Undergraduate Assistant – B.J. Bronston

Campus: Twin Cities

Course name: OMS 2550 – Business Statistics

Number of students impacted by course: 5-6 sections per semester @ 90 students per section = 450 students per semester x 2 = 900 per year.

Course Description: *(Please provide the course overview that appears in course bulletins)*

Business Statistics: Data Sources, Presentation, and Analysis

Business Statistics is designed to provide students with an understanding of and ability to apply; 1) experimental exploratory data analysis, 2) basic inferential procedures, 3) statistical sampling and design, 4) correlation and regression analysis. Primary objectives are to improve statistical thinking capabilities and to indicate how these abilities lead to improved decision making.

Since you last filled out a course profile in May 2006, has your **Student Learning/Teaching Issue** changed, and, if so, how?

The original research project was to incorporate active learning and classroom assessment techniques (ALT-CATs) to the lectures. Since May 2006 the pedagogy has been expanded to include multiple ALT-CATs during each week and even during each lecture period.

Since you last reported in May 2006, has your description of your research project changed, and, if so, how? Please discuss how specific research question/s may have changed. Also include the teaching and/or technology intervention strategies that were changed, added, or deleted, e.g. learning style tests, new case studies, use of web forum, use of game. Please describe any other course adjustments – e.g. adding peer assistants)

The research question has shifted away from expanded lectures vs. use of discussion sections. The research design will consist of a comparison between two large sections of OMS 2550 – Business Statistics. One section will include collaborative learning with ALT-CATs completed in small groups of 3-4 students. The control group will complete the same ALT-CATs but individually, not in groups. Measures of achievement will include performance on exams, total points, attendance, drop-out rate, gpa, and survey items that measure students' attitudes.

Since you last filled out a course profile in May 2006, have you added or subtracted any data collection techniques? If so, please elaborate. (e.g., surveys, CATs, focus groups, data analysis of online discussions)

Surveys measuring students' attitudes will be refined for Spring 2007. Questions will be added to capture additional dimensions of student attitudes.

Since you last reported in May 2006, if you have data that you analyzed, please provide up to at least three new findings. (bulleted list is acceptable):

Data was collected during the Spring semester of 2006. Additional data will be collected at the end of Fall semester of 2006 for an Honors Section and again during Spring semester of 2007.

Please have each team member review their past definitions of what it means to take a scholarly approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Faculty member – Improvements in teaching are hypothesized, data is gathered, analyzed. Evidence either supports or fails to support the underlying theory. The scholarly approach to teaching begins with an underlying theory or hypothesized relationship between variables. Data is gathered on the relevant variables and analyzed via the appropriate statistical technique. The evidence provides feedback on the theory and improvements can be made in teaching.

Undergraduate Research Assistant – The scholarly approach to teaching is about analyzing the ALT-CATs and using the information to find out how to improve.

Please have each team member review their past definitions of what it means to take a collaborative approach to teaching. Then, take a moment to update this definition or let us know if you would like to leave the definition as is. If you have new team members or team members who in the past did not write a definition, have them write their definition. (Please obtain a definition from each course redesign team member and list their role – e.g., faculty, graduate assistant, technical support person, etc.)

Faculty member – The collaborative approach to teaching is based on a team approach with each team member contributing to the teaching effort. The faculty member designs the learning experiences for the course. Then the active learning techniques are analyzed by the Undergraduate Research Assistant. Data is gathered on the effectiveness of the intervention and the Graduate Assistant analyzes the data.

Undergraduate Research Assistant – The collaborative approach to teaching includes the classroom efforts made at improving student learning. I assist the professor in helping administer the active learning techniques. I help groups as they complete the active learning technique and then I analyze the data. The results of the analysis are presented to the class at the next class session.

In relation to your students' learning, what are the biggest impacts your new interventions are making and how do you think you know this?

In the experimental vs. control groups, I have noticed greater connections that students make with their classmates. With ALT-CATs completed in teams of 3-4, students sit together and interact with each other during each class period. The control group students sit apart from each other and do not interact with each other. I suspect that the survey questions on 'connections with classmates' will show significant differences.

APPENDIX E:

***List of Publications, Conferences,
and Internal Presentations by
Faculty and Staff of the University
of Minnesota's Bush Grant***

APPENDIX E

List of Publications, Conferences, and Internal Presentations By Faculty and Staff of the Archibald Bush Foundation | University of Minnesota Enhancing Student Learning Through Innovative Teaching and Technology Strategies Program

Crookston

Publications

Grave, Marilyn. "Criterion Three: Student Learning and Effective Teaching." *Chapter 3, Self-Study Report for the Higher Learning Commission of the North Central Association of Colleges and Schools*. (pp. 86-151) University of Minnesota, Crookston, February 2006

Conferences

Crawford, David. "A Series of Formative Classroom Assessment Techniques Used in Accounting Principles Courses." American Accounting Association, 46th Annual Meeting, Midwest Regional. Chicago. 30 March 2006.

Sedaie, Behrooz. "The Effect of Graphs and Computers on Students' Achievement in College Introductory Economics Courses." Midwest Economic Association, 68th Annual Meeting. Chicago. 19 March 2004.

Sedaie, Behrooz. "The Effect of Principles Courses on Students' Attitude Toward Economic Literacy." Midwest Economic Association, 69th Annual Meeting, Milwaukee. 12 March 2005.

Internal Presentations

Crawford, David. "Students' Academic Efforts and Their Perceptions Regarding Institutional Standards and Expectations." University of Minnesota, Crookston. 16 May 2006.

Duluth

Publications

I. Zualkernan, J. Allert and Ghassan Qadah. "Learning Styles of Computer Programming Students: A Middle Eastern and American Comparison." *IEEE Transactions on Education*, Vol 49, No. 4, Nov. 2006.

Latterell, C.M. (2005). "The study skills of Calculus I college freshmen: A thought piece and essay data." *The Virginia Mathematics Teacher*, 32(1), 46-47.

Conferences

Doorn, David, and Maureen O'Brien. "Assessing the Gains from Concept Mapping in Introductory Statistics" Joint Statistics Meeting of the American Statistics Association. Seattle, WA. 7-10 August 2006.

Doorn, David, and Maureen O'Brien. 76th Annual Meeting of the Southern Economics Association. Charleston SC, 18-21 November 2006

Jenson, Jill. "Promoting Reflective Learning Through Portfolio Use in Composition." Sakai Conference with Open Source Portfolio. Vancouver BC. 30 May – 2 June 2006.

Johnson, Joe, and Bilin Tsai. "Developing Reflective Faculty and Independent Learners." Great Lakes Regional Meeting of the American Chemical Society. Milwaukee, WI. 31 May – 2 June 2006.

Millslagle, Duane. "Comparing Metacognitive Learning Strategies Among Undergraduate Students in Face-to-Face and WebCT Online Delivered Sport Psychology Courses." AAHERD National Conference. Baltimore, MD. 12 -16 March 2007.

Internal Presentations

Allert, James. UMD Instructional Development Service Workshop 10/4/05 on the topic "Do Learning Styles Make a Difference?"

Allert, James (and other Bush grant recipients). University of Minnesota Inter-Campus Conversations on Innovative Teaching, Nov. 1, 2005. Sponsored by the Bush Foundation. "Topic: Learning Style Awareness and the Reflective Process for Improving Large-Enrollment Classes."

Allert, James, UMD Visual and Digital Imaging Lab Seminar 12/2/05 "Visualizing Student Learning in Computer Science I."

IDS Colloquium I: *Creating Independent Learners* Nov 16, 2005

- James Allert, "Creating Self-Directed Learners and Reflective Practitioners"
- Mark Harvey, "On-line vs In-Class Discussion "
- Lynn Bye, "Enhancing Student Learning Through Innovative Teaching and Technology Strategies"
- Duane Millslagle, "Metacognitive Strategies of Undergraduate Students"

IDS Colloquium II: *Branching Out* May 2, 2006

- Jill Jenson, "Promoting Reflective Learning Through ePortfolio Use in Composition"
- Carmen Latterell, "Student Study Skills"

- Chad Pierson, "Personal Response Systems as a Pathway to Self-Regulation and Presence as a Predictor of Performance"
- Justin Rubin, "The Value of Grading to Help Students Better Prepare for Subsequent Classwork"

2007 Presentations to be Submitted this Fall

Steve Vanderheiden, "Connecting Student Outcomes to Exam Preparation Strategies: Promoting Self-Reflective Learning", 2007 meeting of the Midwest Political Science Association, to be held April 12-15 in Chicago IL.

Bilin Tsai, "Reflective Learners and Student Achievement", 233rd National Meeting of the American Chemical Society to be held March 25-29 in Chicago IL.

Morris

Conferences

Solvie, Pamela A., and Molly Kloek. Society for Information Technology & Teacher Education 17th International Conference. Orlando Florida. 20-24 March 2006.

Solvie, Pamela A., and Engin A. Sungur. "Concept Maps/Graphs/Trees/Vines in Education," The 5th WSEAS International Conference on E-ACTIVITIES. Venice, Italy. 20-22 November 2006.

Internal Presentations

Berberi, Tammy. "Disabled Students in Our Classrooms." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22 August 2006.

Berberi, Tammy. "Worlds Apart: Disability and Foreign Language Study." Inter-Campus Conversations on Innovative Teaching. 1 November 2005.

Boyd, Sylke. "Computer Modeling of Materials in Physics." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22 August 2006.

Bremer, Peter, Matt Conner, Pam Gades, Roger Boleman, and Karen Cusey,. "State of Technology Enhanced Learning (TEL)." UMM Fall Faculty Retreat: Enhancing Our Academic Environment. Alexandria, Minnesota. 21-22 August 2006.

Gades, Pam. "Course Tools: New Initiative." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22 August 2006.

Gercken-Hawkins, Becca. "Using Technology to Shape and Support Learning Communities." UMN TEL Seminar Series. 7 December 2005.

- Kahng, Byungik. "Using Mathematica on Teaching Calculus to Diverse Learners." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22 August 2006.
- Kahng, Byungik. "Programmatic Change with Learning Technologies" UMN TEL Seminar Series. 5 October 2005.
- Kloek, Molly. "Learning styles." Learning Styles Resources, and Teaching to Diverse Learning. 3 October 2006. <www.morris.umn.edu/TEL/>.
- Machkasova, Elena, and Nic McPhee. "Dynamic Web Page Teaching Tools." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22, August 2006.
- Myers, Paul. "Reflection Logs for Research in Science (BLOGS)." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22 August 2006.
- Solvie, Pamela A. "Using Technology Tools to Engage Students with Multiple Learning Styles in a Constructivist Learning Environment." Inter-Campus Conversations on Innovative Teaching. 4 April 2006.
- Solvie, Pamela A., and Engin A. Sungur. "Concept Maps." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22 August 2006.
- Thorson, Greg. "Clickers and Wikis: New Opportunities for Student Participation Through Technology." UMM Fall Faculty Retreat: Innovative Learning and Teaching. Alexandria, Minnesota. 21-22 August 2006.

Twin Cities

Publications

- Brakke, Mary, Kevin Smith, Paul Baepler, and J.D. Walker. "Using Problem-Based Learning to Enhance Students' Motivation to Learn." *Creative College Teaching Journal*. Forthcoming.
- Robinson, Julia, Valerie Ruhe, and Marc Beitz. "The Scholarship of Teaching and Learning: Negotiating Multiple Perspectives on Course Redesign to Promote Student Engagement." Presentation. Annual Meeting of the Scholarship of Teaching and Learning Conference. London, UK. 17 May 2006. *Annual International SoTL Conference Proceedings*, Volume 3. London, UK: The Educational Development Centre at City University.
- Ruhe, Valerie, Julia Robinson, and Sue Wick. "Designing Research: The Scholarship of Teaching and Learning in Large Lecture Courses." Presentation. Annual Meeting of the Scholarship of Teaching and Learning Conference. London, UK. 17 May 2006. *Annual International SoTL Conference Proceedings*, Volume 3. London, UK: The Educational Development Centre at City University.

Conferences

- Beitz, Marc, Julia Robinson, and Valerie Ruhe. "The Scholarship of Teaching and Learning: Incorporating Faculty Conceptions and Other Perspectives on Course Redesign to Promote Student Engagement." London SoTL 6th Annual International Conference. London, England. 18-19 May 2006.
- Chen, Amy, Kent Kirkby, Paul Morin, and David Rapp. "Assessing the Effectiveness of Different 3-D Map Styles." Geological Society of America.. 22-25 October, 2006.
- Chen, Amy, Kent Kirkby, and Paul Morin. "Uphill Water Flow - An Example of the Crucial Role of Students' Prior Knowledge in Geoscience Education." 2006 American Geophysical Union. 11-15 December 2006.
- Geier, Heidi Rachel Brammer-Shlay, and William Daddario. "Embodied Learning: Motivating Students through Movement and Imagination." 2006 Collaboration Conference. Bloomington, MN. 17-18 November 2006.
- Gini, Maria, and John Chilton. "Learning Games: Creating Cooperative Competition." 2006 Collaboration Conference. Bloomington, MN. 17-18 November 2006.
- Jensen, Murray. "The Anatomy Bowl: Student Competition and Cooperation." Classrooms of the Future. St. Paul, MN. 23 May 2006.
- Jensen, Murray. "Using the Anatomy Bowl in Your Class." Human Anatomy and Physiology Society. Austin, TX. 27-31 May 2006.
- Jorn, Linda, David Langley, and Carol Carrier. "Engaging Large Classes at a Research University." 2006 POD Conference. Portland, OR. 25-29 October 2006.
- Kirkby, Kent, Fred Finley, Amy Chen, and Paul Morin. "Overcoming Students' Misconceptions in Earth Science Education." 2006 American Geophysical Union. 11-15 December 2006.
- Kirkby, Kent, and Fred Finley. "Using Geological Concept Surveys to Gauge the Relative Effectiveness of Course Components and Instructional Methods in Geoscience Classes." Geological Society of America. 22-25 October, 2006.
- Kirkby, Kent. "Developing and using visualizations in Earth Science classrooms." Classrooms of the Future. St. Paul, MN. 23 May 2006.
- Ruhe Valerie, Julia Robinson, Sue Wick, and Paul Baepler. "Designing Research: The Scholarship of Teaching and Learning in Large Lectures." London SoTL 6th Annual International Conference. London, England. 18-19 May 2006.
- Walker, J. D., Brad Cohen, and Paul Baepler. "Engaging Large Lectures: Inter-Disciplinary Collaboration and Technology." 2006 Campus Technology Conference. Boston. 31 July – 3 August 2006.

Zuiker, Virginia. S., Valerie Ruhe, Brad Cohen, Megan Lundberg, Clinton Gudmunson, and J. Egge. "Using Case Studies in Large Enrollment Courses: A Comparison of Two Methods." Association for Financial Counseling and Planning Education (AFCPE) Annual Conference Proceedings. San Antonio, TX. 15 – 17 November 2006.

Zuiker, Virginia. S., Brad Cohen, Valerie Ruhe, Megan Lundberg, Clinton Gudmunson, and J. Egge, "A Collaborate Approach to Redesigning a Large Enrollment Course Using Case Studies." Presentation at the Annual ISSOTL 2006 Conference. Washington D.C. 9-12 November 2006.

Internal Presentations

Steve Huchendorf, Jason Liu, Marco Habermann, Ryan Schaefer and BJ Bronson. "Twin Cities Bush Grant: Promoting Student Learning in Large Classes: OMS 2550 Business Statistics." Presentation to Carlson School of Management. October 4, 2006.

Solvie, Pamela A. "Alt-Cats in Large Lectures." Inter-Campus Conversations on Innovative Teaching. 4 April 2006

Kevin Smith. Berberi, Tammy. "Problem-Based Learning in Agronomy." Inter-Campus Conversations on Innovative Teaching. 1 November 2005.