The Higher Learning Commission Action Project Directory

Northern Michigan University: Evaluating the Effectiveness of the Laptop Goal: Enhancing Student Learning

---

Project Details

Title	Evaluating the Effectiveness of the Laptop Goal: Enhancing Student Learning	**Status**	REVIEWED
Category	1-Helping Students Learn	**Updated**	09-14-2010
Timeline		**Reviewed**	10-04-2010
Planned Project Kickoff	10-15-2009	**Created**	01-06-2010
Target Completion	10-14-2010	**Last Modified**	10-04-2010

1:   **Project Accomplishments and Status**

A: This Action Project specifically identified one goal of the NMU Teaching, Learning, and Communication (TLC) initiative, drawn from original documents created at inception of the TLC initiative, to be the focus of the AQIP Action Project. This one goal is to "create a learning environment that: a) embraced technology to enhance student access; b) promoted the development of independent learners; and c) encouraged greater student-faculty communication and collaboration." This goal was dissected into its three specific components, and those became the focus of the AP Committee's attention. Definitions for these components were agreed upon at the outset of the project as:

- Student access – putting technology (hardware, software, network) in the hands of students;
- Independent learners – Gaining knowledge by your own efforts from a number of sources;
- Student-faculty communication and collaboration – Exchange of information and knowledge between student and faculty in order to work towards a common goal of student learning.

By March 2009, a mid-term report was written demonstrating that much progress had been made with respect to the Action Project objective to "articulate a process to evaluate this goal on an ongoing basis." That report is available on the NMU AQIP website at http://webb.nmu.edu/aqip/SiteSections/ActionProjects/LaptopLearning/LaptopLearnIntro.shtml. The Committee's focus then turned to the second element of the AP objective to "use this process to assess progress towards the goal at this time" (AQIP Action Project statement). AP Committee members undertook the task of reviewing data sources already available that might lend insight into the degree to which the three components of the TLC goal had been met. Sources sought included surveys conducted either locally or nationally, journal articles, and case studies. While there are challenges with NSSE data such as no clear cause for a particular response, the strengths of NSSE data include data for NMU over time and comparisons to other institutions. When using NSSE data, in addition to NMU results, the AP Committee determined that "Midwest Public Peer" data was best for comparison given that our student population is primarily from that region. Results from "All Public" institutions reported in NSSE were also considered for comparison purposes. AP Committee members determined that the components of the TLC goal could be measured using a combination of (a) data maintained by staff at NMU; (b) reports from NSSE surveys conducted previously and slated to be done again this year; and (c) from the AQIP TLC student survey designed and conducted by the AP Committee.

The AP Committee designed the 16 question AQIP TLC survey which was distributed electronically using Qualtrics software to 20% of NMU freshmen and 20% of NMU seniors selected randomly. For most questions, students were asked to Strongly Agree, Agree, Disagree, or Strongly Disagree. Survey dates of March 29 through April 7 were selected as optimal, following spring break but well before the end of the semester. After the initial e-mail was sent to the 703 students selected to participate, a follow-up message was sent. A total of 194 students responded.

To illustrate the depth and breadth of analysis, the following sections highlight the research findings. In many cases, the answers to questions have spawned new questions.

TLC SUB-GOAL 1: ACCESS
Evidence suggests that NMU was highly successful in creating a learning environment that embraced technology to enhance student access. NMU students have computers in hand, have access to a wide range of software applications, and use computers in their academic work. In spite of some dissatisfaction with some of the hardware and software, the program is well received and the benefits of providing access to students are evident. The fact that NMU faculty and students have widespread access to computing and information technology, and therefore a greater opportunity to use that technology, has resulted in many faculty requiring the use of that technology.

Using the most recent figures, six local data elements provide evidence of student access to computing resources. Out of a student population of 9,258, 8,430 students (91%) had NMU-issued laptops. Between 50% and 61% of students receiving laptops in the fall participate in computer set-up to guarantee proper configuration. Approximately seventy-five software applications are acquired to support instructional and scholarship activities; a current, standardized set of software applications is available for all NMU-issued laptops.   The campus is primarily wireless and NMU's WiMax signal extends to many sections of Marquette and the surrounding region, providing free high-speed Internet access to NMU's WiMax enabled laptops. There are approximately 900 faculty requests to use the course management system each semester. 24 hour access to computing and associated resources is accomplished without general use computing labs on campus. Part-time students who opt not to participate in the laptop program can rent a laptop from the library to complete assignments and exams.

Four NSSE questions relating to access were analyzed. Question 1-L , "Used an electronic medium to discuss or complete an assignment" - NMU freshmen scored higher than either the Midwest or All Public peers; by the senior year, use among NMU and the peers leveled out with all reflecting an increase in e-mail use from freshman year. Question 1-M, "Used e-mail to communicate with an instructor" - NMU freshmen scored slightly lower than their Midwest and All Public peers, whereas NMU seniors scored higher than both peer groups. Question 10-G, "Using computers in academic work" and Question 11-G, "Using computing and information technology" - both NMU freshmen and seniors scored higher than either their Midwest or All Public peers.

One NMU TLC survey question asked students whether "The computer I use most often is one provided by my university or one I personally own."   The response "one provided by my university" was selected by 89% of the respondents.

TLC SUB-GOAL 2: INDEPENDENT LEARNERS
It appears that the TLC initiative goal to create a learning environment that promotes the development of independent learners has been less well achieved. Local survey evidence indicates that the laptop enhances students' ability to learn independently, however, the more comprehensive data contained in the NSSE survey indicate that NMU's students are not any more developed as independent learners than their peers.

Three NSSE questions relating to this component of the Action Project were analyzed: Question 1-D, "Worked on a paper or project that required integrating ideas or information from various sources"; Question 9-A , "Preparing for class"; Question 11-J, "Learning effectively on your own." Compared to peers, NMU students were similar to or behind in tasks and skills identified as demonstrating traits of independent learners. NSSE responses show growth in NMU's students between freshmen and seniors, but our students' NSSE responses do not show results indicating any significant advantage over their peers.

Three AQIP TLC survey questions sought to gather information on students' levels of independent learning. " I use a computer to clarify or enhance my understanding of information presented by my instructors," "I use a computer to seek information that is not class related," "The computer enhances my ability to learn independently. " Students' responses indicate that over half of survey participants strongly agree that they engage in information seeking behavior associated with independent learning.

TLC SUB-GOAL 3: GREATER STUDENT-FACULTY COMMUNICATION AND COLLABORATION
Evidence shows NMU was successful in achieving the goal to create a learning environment that encouraged greater student-faculty communication and collaboration. Responses to questions on the NMU AQIP TLC Survey and

NSSE data verify an environment where student-faculty communication and collaboration is both encouraged and engaged in. The preponderance seems to be toward communication, with collaboration playing a somewhat lesser role. Further investigation about fostering collaboration is warranted if there is interest in increasing this aspect of student-faculty interaction. Further study may reveal that student-faculty collaboration is a dynamic element at NMU, but that it exists in venues other than through technologically based interactions.

Five NSSE questions relating to this component of the Action Project were analyzed: Question 1-L, "Used an electronic medium to discuss or complete an assignment"; Question 1-M, "Used e-mail to communicate with an instructor"; Question 1-P, "Discussed ideas from your readings or classes with faculty members outside of class"; Question 1-S, "Worked with faculty members on activities other than coursework"; Question 8, "Relationships with faculty members." A concern expressed with the TLC initiative was that increased use of technology might actually hinder interaction between students and faculty. The important indication found through this Action Project is that there is no negative impact of infused technology: the technology-rich TLC environment does not present a barrier between students and faculty. While the indication is that providing hardware, network access, and a technology-rich environment may give NMU students an early advantage, AP Committee members are quick to acknowledge there is no way to determine the role of technology in these results and recognize that many other academically-related programs at NMU could figure prominently in the responses to these questions. AP Committee members are curious as to what role, if any, NMU's technological environment plays in the responses to these questions and suggest that this is an opportunity for further study.

Six questions on the AQIP TLC Survey were designed to gather information about communication and collaboration between students and faculty: "I use a computer to communicate with my instructors," "The computer enhances my ability to collaborate or work on projects with my instructors," "Many of my instructors communicate with me by computer," "I communicate with my instructors more than I would if I didn't have access to a computer," "Overall, my instructors encourage the use of the computer to assist with the exchange of ideas and information" and "The availability of computer at my university encourages greater communication and collaboration between students and instructors." Clearly students who responded to the AQIP TLC Survey report that they use the computer to communicate with instructors and vice-versa (96% and 97% either agree or strongly agree). Students also responded overwhelmingly (95% either agree or strongly agree) that the computer "encourages greater communication and collaboration between students and instructors," the environment which is the essence and exact language of the TLC Initiative goal.

In the AQIP TCL Survey, students could provide a written comment on any issue related to the TLC. A qualitative analysis of written comments revealed five major themes: (a) cost of the laptop, (b) quality of the laptop, (c) university laptop provision/requirement, (d) communication and (e) course use. Comments were analyzed to determine whether they were of positive (37 comments), negative (24 comments) or both (22 comments).

Survey documents and detailed analysis of data from these data sources appears in the complete version of the committee's final report, available from http://webb.nmu.edu/aqip/SiteSections/ActionProjects/LaptopLearning /LaptopLearnIntro.shtml. Committee members met throughout April and May to analyze data collected from various sources, including the April AQIP TLC survey, to discuss conclusions and recommendations. The final report was written and edited by the committee during the summer and submitted to the AQIP Liaison in August.

R: The institution selected a very ambitious yet important AQIP action project. The role that technology plays in learning is critical as technological advances continue to impact education at all levels. The status update represents commendable work done by the institution to design and implement the laptop evaluation project, and the detail of the annual update, as well as the materials included on the website (the reports and survey results) is exemplary. The project aligns well with AQIP Categories One: Helping Students Learn; Three: Understanding Students' and Other Stakeholders' Needs; and Seven: Measuring Effectiveness.

2: **Institution Involvement**

A:

The membership roster of the Action Project was confirmed in December, 2009. The committee members represent each of NMU's colleges, academic levels, and support units: Dean of Academic Information Services; Department Head of Technology and Occupational Sciences; faculty from Business, Communication & Performance Studies, Education, Health, Physical Education & Recreation, Olson Library and Practical Nursing; Chair of Teaching and Learning Advisory Council; and Manager of Computing HelpDesk. An organizational meeting was held December 15, 2009 to introduce members to each other, review the Action Project and Committee charge, discuss the action project timeline and solicit members' schedules. The committee agreed to two-hour meetings every other week throughout the Winter semester. When the committee members search for existing resources did not find a suitable survey instrument, it received assistance from NMU's Office of Institutional Research to design and distribute its own survey using Qualtrics software. Permission was secured from the NMU Institutional Review Board to administer the AQIP TLC survey to a random sample of NMU students.

R: The institution drew upon a variety of stakeholders across the institution to plan and implement this project, including faculty, administrators, and institutional technology representatives. One suggestion for future projects is to include student participation as well. This project impacted faculty and students directly and in important ways, and representation from this constituency can help more directly gather input from students in the planning phases. Another suggestion is to review the assessment expertise on campus and perhaps invite outside experts to participate in future projects related to assessment of technology and its impact on learning.

3: **Next Steps**

A: **CONCLUDING THE PROJECT**
The AP Committee's assessment is that overall, the TLC goal to create a learning environment that embraced technology for student access, promoted development of independent learners, and fostered communication and collaboration between students and faculty was achieved. To fulfill the AP outcomes measures, these findings will soon be presented to the President's Council and academic leadership, the AP Committee final report will be posted along with the mid-term report on the NMU AQIP website, and results will be shared with the campus community through campus media for continued discussion. As such, the Action Project will be completed by the mid-October 2010 date. The AP Committee also recognizes that ongoing review of the TLC program could lead to improvement. Additionally, it would be advantageous to move beyond the question of whether we created a learning environment that embraced technology to the next question of what effect that environment has on student learning. This latter question requires faculty involvement and opens the door for numerous scholarship opportunities. AP Committee members believe there are committees and mechanisms already in place for ongoing assessment of the TLC initiative and that these recommendations can be implemented with minimal cost if rolled into existing structures and regular tracking for continuous improvement.

RECOMMENDATIONS FOR ONGOING ASSESSMENT
To illustrate the committee's effort at developing implementable recommendations, the recommendations and suggested implementation units are given below. The rationale and details for each recommendation appear in the AP Final Report posted on the NMU AQIP website. Implementation will depend upon discussion and acceptance of recommendations by the the wider campus community, particularly the units mentioned in these recommendations.

1. The NMU AQIP TLC Survey (or some similar variation thereof) should continue to be administered to a sample of NMU freshmen and seniors. The AP Committee recommends that the TLC Steering Committee conduct this survey annually.
2. Qualitative responses from the NMU AQIP TLC Survey, especially those addressing the quality of laptops, should be reviewed in the spirit of inquiry and analysis before final decisions about new laptop models are made. The TLC Steering Committee is viewed as the appropriate venue for this review.
3. Using the NMU AQIP TLC Survey, qualitative responses should be reviewed each time the survey is conducted to determine whether policies or guidelines need to be revised or developed. The Educational Technology and Planning Resources Committee (ETRPC) and the Teaching and Learning Advisory Council (TLAC) are existing committees appropriate for this review.

4. Identify additional or alternate peer institutions with whom to establish strong, long-term relationships. The TLC Steering Committee could assist with identifying these peers.
5. To improve the comparative assessment of NMU students relative to their peers, the NMU AQIP TLC Survey of student computer use should be done in collaboration with at least two peer institutions once every two years. It is recommended that the TLC Steering Committee conduct this survey in conjunction with the survey administered to NMU students. Data gathered and analyzed by the TLC Steering Committee should be shared with both the ETRPC and TLAC.
6. A survey comparable to the NMU AQIP TLC survey developed for students should be administered to faculty at NMU and at peer institutions. This survey could be conducted by either the TLAC or ETRPC.
7. The TLC goal of promoting the development of independent learners is the least achieved of the three sub-goals of the TLC initiative. It is recommended that the TLAC initiate a project to help faculty identify, develop, and encourage classroom strategies and assignments that further students' skills in independent learning.
8. To monitor continued benefit of the TLC initiative, NSSE data for NMU and peer institutions should be reviewed, beginning with the 2010 NSSE survey data. The TLC Steering Committee should review the NSSE data each time the survey is administered at NMU.
9. The TLAC and/or individual faculty should be encouraged to pursue additional research projects designed to ascertain the impact of the use of technology on student learning at NMU within specific courses or programs of study. This activity would help NMU move beyond the question of whether we created a learning environment that embraced technology to the question of what effect that environment has on student learning.

R: The institution, as a result of this well designed and implemented action project, has achieved an important goal of establishing an assessment foundation for this project that can be sustained. The very important question, as identified in this update, is the impact of technology on student learning. In addition, it will be important to determine multiple ways to assess objectively faculty student interaction to understand if perceived interaction is related to actual interaction and how this then impacts student learning. The reviewer recommends considering this as a future action project, as this kind of assessment, while challenging, may be exactly appropriate for an action project that will help focus resources. It also has implications for assessment of technology integration in all levels of education. Such a project would require the involvement of multiple stakeholder groups within (and potentially outside of) the organization in determining how the actual impact on learning can be assessed.

4: **Resulting Effective Practices**

A: The Action Project articulated a process to evaluate a goal on an ongoing basis. Process elements, which could be used by other committees to plan an initiative assessment project, were adopted by the AP Committee:
1. Analyze components of the goal to be assessed;
2. Clarify definitions within the goal to be assessed (original documents associated with the initiative, input from key personnel involved, and other resources were used to accomplish this task with respect to this particular action project);
3. Identify and review possible data sources already in existence at NMU;
4. Identify and review possible data sources used elsewhere;
5. Select peer institutions for comparison;
6. Develop or identify an appropriate survey instrument to gather additional data;
7. Secure permission to conduct the survey at NMU and peer institutions. These process elements were modified along the way as needed.

Definitions were important in keeping the team focused on the goal specified in the Action Project. The definitions were also critical in helping AP Committee members determine the most appropriate data resources and survey questions to use in assessing success of the goal.

R: The institution has established a best practice in building an assessment strategy for technology integration. The

reviewer recommends sharing this with other institutions at one of the Higher Learning Commission annual meetings. As external scrutiny increases around demonstrating that learning is occurring, such a project can be a model even for institutions that are struggling to adopt effective assessment programs.

5: **Project Challenges**

A: Comparison to peer institutions was a planned component of the assessment process. Using an NMU list of current peer institutions, the AP Committee selected Winona State University as the laptop peer, and Saginaw Valley State University as the non-laptop peer. Both peer universities were contacted and expressed a willingness to assist with our assessment project. We planned a random sample of students at all three universities to complete a questionnaire, designed by the AP Committee, to gather perceptions about computer use, independent learning and student-faculty communication. Survey dates, based on university calendars for all three institutions, were chosen to garner the most responses. It proved more challenging than anticipated to administer this same survey at the selected peer institutions. In spite of the positive initial responses received from both identified peers, it proved impossible to secure the cooperation required to identify a random student sample and distribute an e-mail message to those students requesting survey participation. This is not to say that such a survey could not be administered at those institutions. Instead, due to the delays encountered in sorting through permissions and securing assistance, particularly from technical staff at the peer institutions, the time frame for getting a good response rate was missed. Recommendations #4 and #5 were included by the AP Committee in an effort to reattempt a peer process. Whether NMU adopts those recommendations as stated, it is in our best interest to continue our efforts to cultivate a cooperative relationship with peer institutions and thereby garner participation from those peer institutions. Perhaps such relationships are best achieved by individual faculty or staff in partnership with colleagues at the peer institutions and in circumstances where the collaborative work is accomplished for mutual benefit. A final consideration is that when identifying peer institutions, mutual benefit might be recognized more readily in institutions who themselves participate in the AQIP process.

R: There are very clear challenges to gaining cooperation of peer institutions in a project of this magnitude, particularly if such a project is not high among the cooperating institution's priorities. However, the reviewer does not view this as a serious flaw in the project. The TLC survey was developed and implemented across the organization, which is an important first step. As noted earlier, extending this work in a second AQIP action project is highly recommended. As part of that project, it may be worth attempting to determine the questions that are psychometrically sound that could be potentially added to the NSSE in order to begin getting cross-institutional data for comparison (which was the goal of the studies of other laptop and non-laptop institutions). The institution can be one of the institutions that sets the standard for how this kind of assessment is accomplished.