CHAPTER 1

Electronic Portfolios

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Introduction

A member of the North Dakota University System, Valley City State University (VCSU) is a leader in the effective use of instructional technologies and offers baccalaureate degrees in education, business, and the liberal arts. With a student population of 1,100, VCSU is among the smallest public baccalaureates in the nation; however, there is nothing small about its ambitions.

In 1995 VCSU adopted an electronic portfolio initiative and in 1996 became the second four-year laptop institution in the nation, providing laptop computers to all of its faculty and students.

Its mission statement confirms the significance of learner-centered instruction, innovation, and instructional technology as hallmarks of VCSU's efforts to prepare individuals to serve in a changing world.

The bold initiatives VCSU has undertaken in the last ten years demonstrate its innovative spirit and willingness to adapt while remaining on the frontier of best practice. The integration of technology in teaching and learning through the laptop initiative and the digital portfolios represent just two innovations. VCSU has also created the nation's only Technology Education program that (a) meets new national standards in this field and (b) is available online. Over 70 percent of faculty have adopted online course software (Blackboard) as a tool for their classes. Each initiative was undertaken for the purpose of giving students a more flexible (customized) learning environment and expanding the possibilities of a learner-centered education. A student survey provides evidence of the university's student-centered

environment. Results of the survey and more information concerning VCSU's student-centered experience can be found in a report on the VCSU Web site (Holleque, 1998 April).

Best Technology Practices Project

The Best Technology Practices project became visible on the campus in November 1995. It was designed to employ ability-based assessment as a tool in the curricula and enable students to complete an electronic portfolio on CD-ROM. VCSU secured a five-year Title III grant of $850,000 for the project. The grant funded equipment, personnel, and support for faculty training and stipends. It also enabled the portfolio process to become a campuswide initiative from its inception. Figure 1.1 provides an example of the VCSU senior portfolio. The portfolio presents a "best works" collection of student projects illustrating the student's competence in the eight University Abilities.

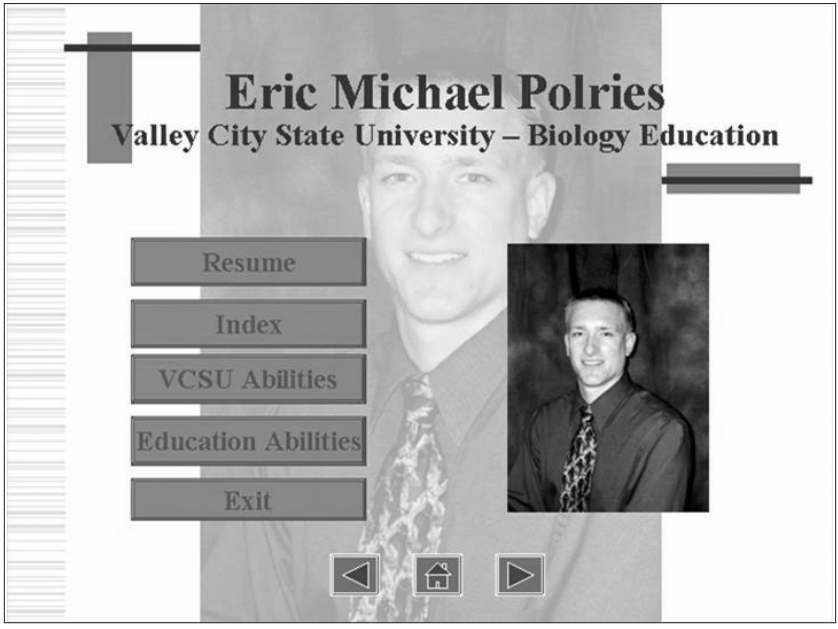

Figure 1.1 Portfolio

Table 1.1 Abilities and Skills

1. **Communications**
   - Written
   - Visual
   - Spoken
   - Performance
2. **Problem solving**
   - Gathering Information
   - Problem Recognition
   - Creative Thinking
   - Systems Analysis
   - Decision Making
3. **Collaboration**
   - Positive Interdependence
   - Leadership
4. **Technology**
   - Selects
   - Applies
5. **Effective Citizenship**
   - Provides Service to Others
   - Teaches Others
   - Change Agent Skills
6. **Aesthetic Engagement**
   - Receptivity
   - Visualization
7. **Global Perspectives**
   - Works with Diversity
   - Understands System Interrelationships
8. **Wellness**
   - Self Management
   - Self Worth

The 8 abilities and 22 skills endorsed by the institution are the fundamental underpinnings of the portfolio. The VCSU faculty authored the abilities and skills and the faculty senate adopted them. Table 1.1 displays the 8 abilities and the 22 skills that define the abilities. Nearly every academic course includes an ability-based project assignment. The senior portfolio provides documentation of the student's achievement of the abilities.

The diffusion of the portfolio process began with a 10-member faculty learning team, representative of the academic divisions. The team members discussed the portfolio process and made decisions concerning the purpose, audience, and expectations of the senior portfolio. Among the articles read and reviewed by the team were *Linking Assessment with Reform: Technologies that Support Conversations about Student Work* (Sheingold and Frederiksen, 1995), *Portfolios Across the Curriculum and Beyond* (Cole, Ryan, and Kick, 1995), and *Portfolio Assessment: Some Questions, Some Answers, Some Recommendations* (Gillespie, Ford, Gillespie, and Leavell, 1996). The Learning Team members also received training in the hardware and software needed to create multimedia projects. The second year of the implementation process included one-on-one mentoring for 10 more faculty each semester. The process continued until, by the end of the fourth year, 85 percent of the faculty had been mentored. In the fifth year (1999), a priority was placed on mentoring new faculty. In addition, faculty stipends were provided

Table 1.2 Business Administration Ability Map

Division Outcome	Ability	Skill	Targeted Levels / Classes				
			Level 1				
To convey thoughts, ideas, data, information and messages effectively	Communication	Written			BVED 340	MGMT 480	
		Spoken			ACCT 335	MGMT 430	
		Visual			MRKT 230	MRKT 303	
To select and use appropriate and effective approaches and tools in solving a wide variety of problems	Problem Solving	Gathering Information			ACCT 201 FIN 380	ACCT 362	
		Problem Recognition			ACCT 202	MGMT 405	
		Creative Thinking			ACCT 321 MGMT 350	ACCT 322 CORP 320 MGMT 485	
		Systems Analysis			ECON 261	ACCT 370	
		Decision Making			FIN 380 MRKT 405	ACCT 361 MRKT 415 MGMT 425	
To look beyond one's immediate self and local community	Global Awareness	Works with Diversity			MGMT 460		498
		Understands Systems Interrelationships			FIN 350	MRKT 320	
To work together or act jointly to reach a common goal	Collaboration	Positive Interdependence			MGMT 330		
		Leadership			MRKT 305		
To select and apply technology appropriately	Technology	Selects					
		Applies			MRKT 302	FIN 375	

for ability-portfolio activities. Some faculty generated ability-based projects with rubrics and integrated them into their courses, while others created program maps that illustrated the connections between courses and the abilities and skills (see Table 1.2).

Abilities and Skills

Over the past eight years the faculty of Valley City State University have endeavored to modify the general education objectives and to establish a more meaningful connection between general education course work and the academic majors. To facilitate the process, a campuswide committee of faculty was formed. The committee identified a set of eight abilities from the existing objective statements and later added 22 skills that further defined the abilities. It was determined that students would demonstrate the abilities and skills through projects in both general education and major courses. These projects were constructed to include both content knowledge and

experience in a specific ability and skill. The faculty reached consensus on the abilities and their related skills during the spring of 1999, with the completion and approval of the *Abilities, Skills, and Levels* booklet.

Documenting and assessing student growth in abilities became a topic of discussion on the campus. The senior portfolio assessment process is seen as a practical tool that allows students to demonstrate ability and skill competence levels.

Portfolio Integration

During freshman orientation, following the distribution of the notebook computers, a four-hour computer basics session is held. The senior portfolios are demonstrated at this time. Necessary hardware and software skills for multimedia development are included in a required general education course taken by 95 percent of freshmen. The course activities include Microsoft Office Suite, scanning, CD burning, and audio and video capture. All other necessary expertise is integrated into existing courses.

The division of education was the first to fully adopt the senior portfolio. Their graduates were required to present portfolios beginning in 2000. Beginning in the spring of 2002, all graduates from VCSU are required to present digital portfolios. Faculty in the students' academic major review and assess the portfolios. The completed portfolios are archived on CDs and stored in the university library. At the time of the portfolio presentations about 20 percent of students are asked to modify their portfolios prior to acceptance by the division. Many modifications are completed within a day, others are returned in a week, and, in the worst-case scenario, a student returns the portfolio after several months.

Each division determines how and where their students begin to develop the portfolio. Most have integrated it into a course in the sophomore year. All portfolios must demonstrate five abilities. The academic divisions determine which five of the eight abilities each major focuses on.

Each division offers a one-credit senior portfolio seminar to aid students in portfolio development. These seminars review portfolio expectations, the layout of the portfolio, the acceptable projects, and some of the technical skills required. In addition, a portfolio

handbook for students is available. It includes step-by-step instructions, technical information, and examples. A Web site makes this document and other divisional materials available to students. (http://www.vcsu.edu/facultystaff-dev/portfolios.htm).

Problems and Issues

- During the first six months of the portfolio adoption process, the learning team met regularly to discuss the VCSU portfolio. The learning team focused on reading, reviewing, and discussing portfolio development. Hardware and software training for creating the portfolios was not begun until late spring of 1996. This planning period is very important because it takes the emphasis off electronic and places it on portfolio.
- The learning team struggled with how much of the portfolio should be prescriptive. The team reviewed many templates and looked at available samples from other institutions. Based on the VCSU's mission, the team envisioned a student-centered portfolio in which students make decisions on what and how to present the information.
- The team also encountered another portfolio difficulty. Too often portfolios became a collection of stuff (we use the metaphor "rattling shoebox"). A clear understanding of the purpose and use of the portfolio is important. Multiple purposes may cause it to become very cumbersome and difficult to assess. The team found its first choice of audience (employers) and purpose (employment) to be too limiting. In 1999, the decision was made to change audience to divisional faculty and purpose to academic assessment. Using the portfolio as an employment tool remains an option for students.

VCSU discovered the importance of mapping the projects in the various disciplines. This is the beginning of the assessment process and its importance should be realized. The maps effectively connect the outcomes of the major to the abilities and skills and provided

students with a visual representation of how the portfolio projects fit into the curriculum. Table 1.2 is an example of a Business Administration map.

Tracking Student Progress

The university has come to realize the rich assessment potential of the projects. The senior portfolio encompasses only a small number of projects. However, it is necessary to collect and organize the projects before they can be utilized. Server space will soon be made available for students to deposit and store their projects. Like the senior portfolio, this space is to be managed by the student. The university has planned and is currently building a Web-based tracking software. This software will allow students, advisors, and faculty to track a student's progress through the abilities. It also provides an organized means of accessing projects based on student year, ability, and semester created. This access can provide evidence of student learning from freshman through senior year. The software was implemented in fall of 2003.

Evaluating Success and Assessing Outcomes

Faculty are diversifying the learning experiences of the students with innovative teaching strategies. Data gathered in 2000, the last year of the Title III grant, indicated faculty technology adoption was successful.

- 94 percent of faculty indicated they had portfolio projects integrated into their course requirements
- 80 percent reported their computer was essential to their teaching (Marcinkiewicz and Welliver, 1993)
- 69 percent of faculty reported they required students to use five or more types of technology in their courses

Data gathered over the five years of the portfolio adoption process (1996–2000) indicated growth in the use of technology for teaching and learning.

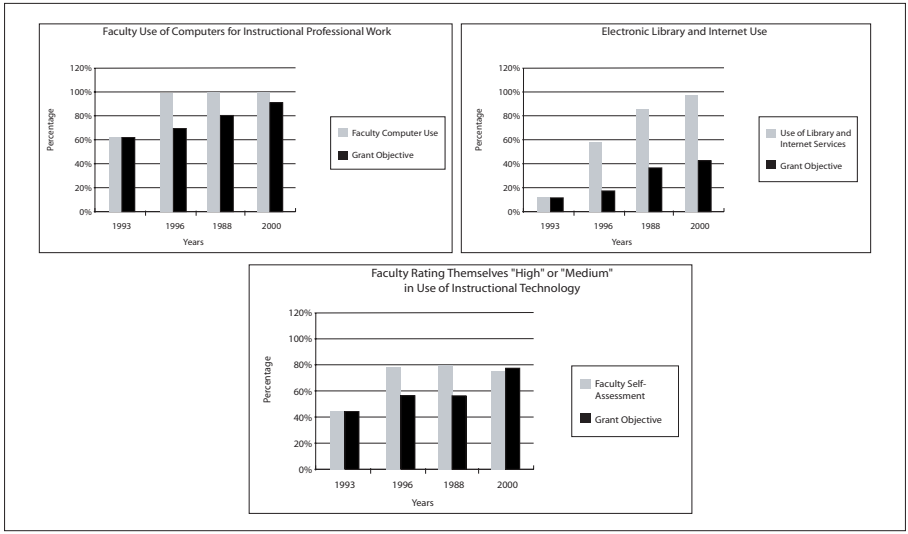

Figure 1.2 Comparison of Grant Objectives to Campus Data

- Percentage of faculty requiring student use of multimedia increased from 18 percent to 46 percent
- Percentage of faculty using multimedia in their instruction increased from 21 percent to 66 percent
- Percentage of faculty who included at least one technology requirement in their syllabi rose from 23 percent to 93 percent

Data from a faculty survey conducted by Kenneth Green in 1994 was used as baseline data for the Title III grant. The charts in Figure 1.2 represent the yearly grant expectations in comparison to VCSU survey results. The faculty's technology use met or exceeded the grant objective in every case.

Figure 1.3 compares the results of national surveys (Green, 1996 and 1999) on technology use by faculty to technology use by VCSU faculty. Technology use on the VCSU campus rose significantly higher than the national average between 1996 and 1999.

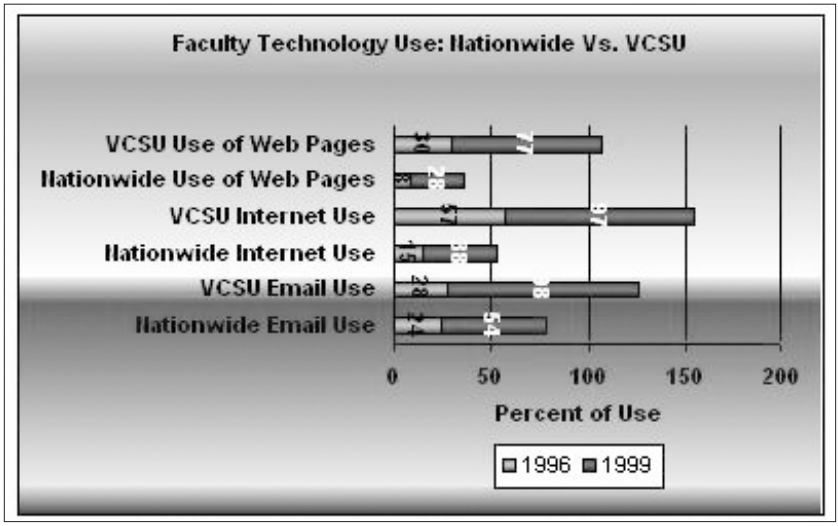

Figure 1.3 Faculty Technology Usage

Assessing Outcomes

- The ability-based projects that the faculty continue to create and improve provide richness in the curriculum that engages the students in more active, real-world learning experiences.
- The reflective statements required as part of the portfolios have affected the amount of reflective writing expected by faculty in other assignments.
- VCSU students are becoming self-directed, self-assessing learners. The use of ability projects in general education classes and the completion of the senior portfolio provide students with ownership in the assessment process. The student-centered tracking software for storage of projects will make students responsible for their learning materials.

VCSU has become a technology-rich teaching and learning environment. Student surveys reveal that the university is providing instructional methods that indicate good practices in teaching (Chickering and Gamson, 1987). See Figure 1.4.

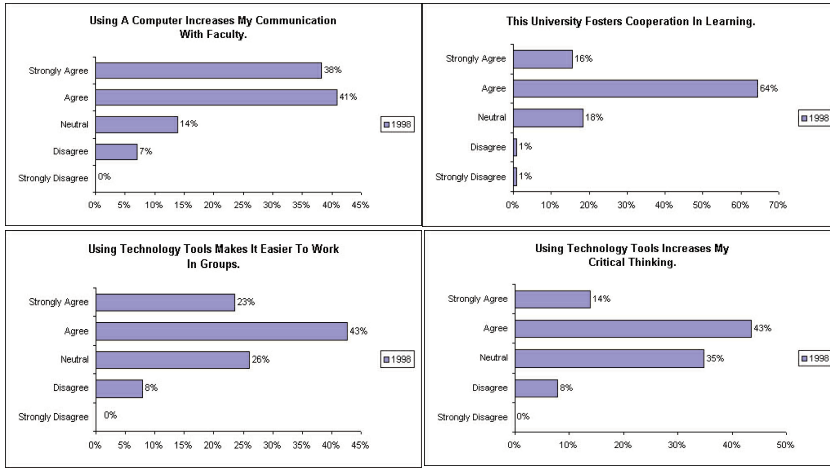

Figure 1.4 Student Survey of Good Practices in Teaching

Every year a survey is sent to employers of VCSU's newest graduates. The survey asks the employer to rate their satisfaction with the employee in each of the eight abilities areas. Figure 1.5 indicates the results of the surveys beginning in 1996. The charts display an increase in satisfaction by employers for nearly every year.

Over the five-year period from 1996 to 2000 four factors stand out as important in assessing the impact of the portfolios:

1. The student population attending VCSU has not changed during this period.

2. Campus surveys indicate technology use by faculty and students has increased significantly. The 1996 and 1999 Campus Computing Project surveys by Kenneth Green (http://www.campuscomputing.net) indicate that other institutions of VCSU's type have risen in the use of technology in instruction much more slowly than VCSU.

3. Students recognize that they are experiencing teaching strategies that indicate good practices in teaching (i.e., good faculty-student interaction, active learning, collaborative learning, and real-world applications).

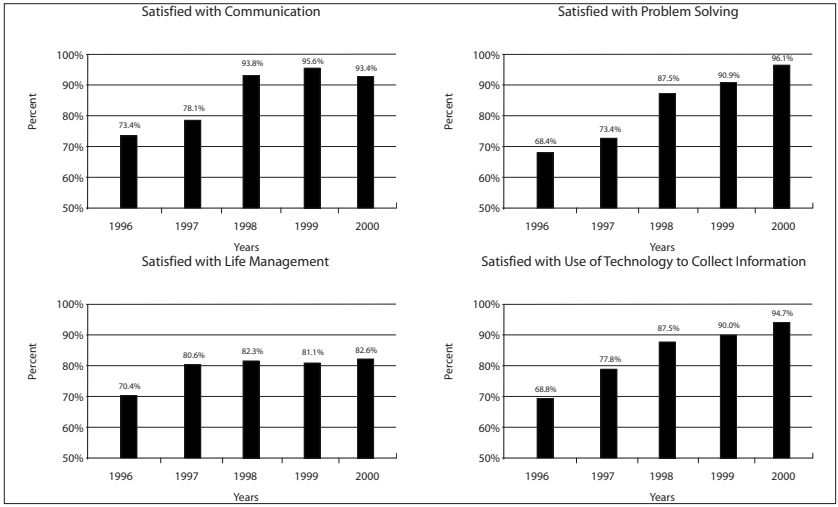

Figure 1.5 Assessment of Employer Satisfaction

4. The satisfaction of employers with VCSU graduates is increasing.

It is difficult to determine what part the portfolios alone played in the changes and improvements at VCSU over the past six years. It may not be necessary or possible to determine what impact the portfolio adoption had on teaching and learning. Researchers like Steve Gilbert (1996) suggested it is necessary to have a density of technology use before changes in learning can be appropriately measured. He states, "To make visible improvements in learning outcomes using technology, use that technology to enable large-scale changes in the methods and resources of learning. That usually requires hardware and software that faculty and students use repeatedly, with increasing sophistication and power. Single pieces of software, used for only a few hours are unlikely to have much effect on graduates, lives or the cost-effectiveness of education."

Once this technology richness is acquired it is only necessary to study the evolution of an institution's education strategies as Ehrmann (1995) states: "To assess changes in learning a university must study its educational strategies for using technologies. It is not possible to measure these strategies in a single course but it

must be done across the institution or division if the evolution of the strategies is to be monitored." The results would indicate that electronic portfolios are an effective strategy for improving instruction and learning in an institution of high learning.

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