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ABSTRACT

This study used a total quality management (TQM) approach to evaluate the perceived computer competency needs of students at the University of Wisconsin-Stout by surveying students (who were asked which of a list of competencies they had), administrators, alumni, and employers (who were asked which competencies they used or expected in employees). For the study 157 new freshmen, 32 undergraduate program directors, 50 alumni, and 100 employers were asked to complete a survey that asked for demographic information and about the usefulness of competencies grouped under the following areas: basic computer skills, word processing skills, spreadsheet skills, database skills, graphics/multimedia skills, and information retrieval/telecommunications skills. The study received responses from all the students, 27 of the program directors, 72 employers, and 30 alumni. Analysis of the data led to the conclusion that all graduates of UW-Stout should be able to: (1) use MS-DOS commands and the "Windows" interface; (2) manage files on a hard disk; (3) learn to use a program with the documentation provided; (4) generate business letters and research reports; (5) create a spreadsheet that includes formulas; (6) create, sort, and query a database; (7) create charts, graphs, and flow charts; and (8) send and retrieve electronic mail. Includes an analysis of the group dynamics under the Total Quality Management philosophy. Appendices appendix contain figures, sample cover letters, and the survey instruments. (JB)

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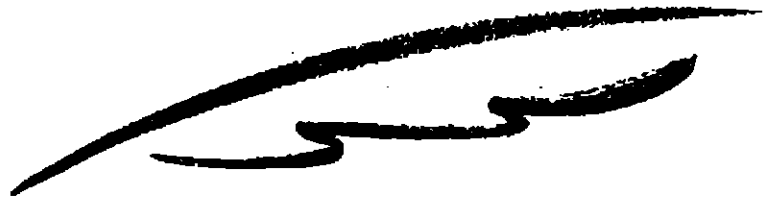
COMPUTER COMPETENCIES FOR UW-STOUT STUDENTS

ED 375 696



STOUT
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TQM TEAM REPORT

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EXECUTIVE SUMMARY

During the past decade, the microcomputer has become an increasingly important tool, both in the classroom and in the workplace. To be successful in many academic programs and in many careers, it is essential that students possess strong computer skills. However, instructors and support staff involved with student computer use in the classrooms and laboratories on campus encounter widely differing levels of computer competency among UW-Stout students. Although introductory computer courses are available, most students are not required to take these courses or demonstrate computer proficiency. There is no consensus as to how computer competencies should be obtained or who should be responsible for providing these competencies. There is little agreement on what level of skill is necessary for success at UW-Stout or in business and industry.

To help address these issues, a total quality management team was established in the fall of 1993. Provost George DePuy was the sponsor for this team and Academic Staff Senate Chair Steve Schlough was the team leader. The team was entitled "*Computer Competencies for UW-Stout Students,*" and its members included a representative cross section of the university and represented various areas of expertise. The team included: Linda Anderson, Custodial Supervisor; Carl Boger, Program Director, Hospitality and Tourism; Tom Franklin, Professor, Department of Psychology; Julie Furst-Bowe, Assistant Professor, Communications, Education, and Training Department; Milt Findley, Student; Betty McIntyre, Consultant, Computer Users Support Services; Janet Polansky, Professor, English Department; Marcia Snarski, Student; and Michael Stein, Student.

The team was to examine existing data and obtain additional data from specific groups including students, faculty members, alumni, and employers regarding computer competencies. The team was charged with creating an ideal model of student computer competency development in relationship to UW-Stout's organizational goals and resources and to establish an action plan for its implementation. In addition, the team was asked to assess its final products and procedures, identify any problems, and adjust for contingencies. Finally, the team was charged with communicating their results to the various groups associated with student computer competencies.

After reviewing relevant information on this subject, the team developed a computer competency survey to obtain data from students, program directors, alumni, and employers. The content for the questionnaires was created through discussion by the TQM team, review of previous research, and discussion with knowledgeable members of the UW-Stout community. The instrument contained items regarding several

types of computer competencies. The competencies were grouped into several categories including Basic Computer Skills (12 items), Word Processing Skills (7 items), Spreadsheet Skills (6 items), Database Skills (7 items), Graphics/Multimedia Skills (6 items), and Information Retrieval/Telecommunications (5 items).

The survey was given to 157 students, 32 undergraduate program directors, 50 alumni and 100 employers. The survey was returned by 157 students, 27 program directors, 30 alumni, and 72 employers. Responses from these various groups were considered adequate to represent them confidently. The format of the survey varied slightly for each of the groups. The list of tasks or competencies remained the same; however, students were asked if they could perform the tasks, program directors were asked if their students needed to perform the tasks, alumni were asked whether they needed to perform the tasks in their current position, and employers were asked whether their employees needed to be able to perform the tasks.

The data was then analyzed by Computer User Support Services and reviewed by the team. Based on the data and input from team members, the team then reached a consensus on the following primary recommendation:

Upon graduation, at a minimum, all UW-Stout graduates will be able to perform the following computer skills:

- Use MS-DOS® commands and the Windows™ interface
- Manage files on a hard disk
- Learn to use a program with the documentation provided
- Computer generate business letters and research reports
- Create a spreadsheet that includes formulas
- Create, sort, and query a database
- Create charts, graphs, and flow charts
- Send and retrieve electronic mail

In addition to these skills, UW-Stout graduates will possess a variety of computer skills specific to their program.

The team then developed additional recommendations to ensure that students will be able to develop these competencies. These recommendations include providing information on computer competence to faculty, staff and students; identifying computer competencies currently being taught in UW-Stout courses; and developing a procedure to ensure that students demonstrate proficiency in these skills.

INTRODUCTION

Background

The mission and philosophy of UW-Stout emphasizes academic programs which address "the evolving economic, technical, and environmental demands of a global society" and which seek "to integrate technology, business, and service concepts." UW-Stout also promotes experimentation with new instructional methods and provides classrooms and laboratories equipped with modern learning technologies and up-to-date equipment. However, classroom teachers and support staff involved with student computer use in the classroom and in laboratories encountered widely differing levels of computer competency when students entered the university and when computer use was required for academic tasks.

Although introductory computer courses were offered on a regular basis, students were not required to take these courses or demonstrate computer competence on a universal basis. There was no consensus as to how computer competencies would be obtained or who was responsible for providing these competencies. There was little agreement on what level of skill was necessary for success in introductory and advanced coursework or on the types of computer skills necessary to obtain and maintain employment after graduation.

Alumni and their employers were surveyed periodically in regard to the university's effectiveness in supplying a number of different skills and attributes necessary for professional success, but computer use was not included. In view of the long-term goals of providing a technologically literate society, both now and in the future, two members of the Total Quality Leadership Council-- both classroom teachers-- brought these concerns to the Council as a possible project in the fall of 1993. Their query was taken up, and a TQM team was formed under the sponsorship of Provost George DePuy. This team of faculty members, staff members, and students was chargéd with designing a model of computer competence necessary for success in general university coursework and upon entry-level employment. This group also made recommendations about the university's present capability and future needs.

Background on Team Formation

UW-Stout has had pockets of involvement relating to total quality management over the years. The involvement included courses that taught quality principles, faculty/staff consulting with industry, and departments taking on quality initiatives on their own. However, there had not been an organized university-wide focus to TQM. In the fall of

1991, Margaret Madson and Gloria Bjornerud, academic staff employed by the Administrative Services Division, wrote an Academic Staff Professional Development Grant proposal to provide TQM training for selected academic staff in the Administrative Services Division. This same training was extended to upper administration, deans, and governance leaders. Two two-day TQM training sessions were held in the spring of 1992. The sessions were conducted by Dr. Casey Collett. Dr. Collett is a consultant with industry background in TQM principles and has spent the last several years training higher education and health care organizations in TQM principles.

During this same time period, the University of Wisconsin Board of Regents and System Administration had been discussing adapting TQM principles to UW-System institutions. In 1992, UW-System Administration directed the UW-System institutions to become involved in TQM. Annette Taylor was designated as TQM Coordinator for UW-Stout on August 1, 1992. Chancellor Sorensen sent out a memo dated September 15, 1992, announcing the formation of the UW-Stout Total Quality Leadership Council and the council first met on September 21, 1992. The membership of the TQLC consisted of upper administration, a dean, representatives from the three governance groups on campus, and two classified employees (one a union member and one not). The TQLC sponsored five TQM teams, consisting of faculty members, staff members, and students for the 1992-93 academic year. A two-day training session was conducted for these teams by Dr. Collett. The TQLC again sponsored five teams of faculty members, staff members, and students for the 1993-94 academic year. These teams also received two days of training by Dr. Collett. The team training was funded through a two year Stout Foundation grant.

This team, Computer Competencies for UW-Stout Students, was one of the teams for the 1993-94 year. Provost DePuy was the team sponsor for this team. Provost Depuy selected Steve Schlough as the team leader. Provost DePuy and Schlough worked to select the team members. The basic parameters for selection was to have a representative cross section of the university. Members were chosen to represent different areas of expertise. The team members included a department chair, a program director, a lab supervisor, instructors teaching classes that required the use of computers, a freshman student, a senior student who worked in a general access computer lab, and a nontraditional student. The team facilitator, Linda Anderson a classified supervisor, was chosen by recommendation from the TQM coordinator's office. The list of team members are as follows:

- Linda Anderson: Custodial Supervisor 2, Student Center/Custodial, Student Center
- Carl Boger: Program Director, Hospitality and Tourism, School of Home Economics
- Tom Franklin: Professor, Department of Psychology, School of Education and Human Services
- Julie Furst-Bowe: Assistant Professor, Communications, Education, and Training Department, School of Industry and Technology
- Milt Findley: Student
- Betty McIntyre: Information Process Consultant, Computer Users Support Services
- Janet Polansky: Professor, English Department, School of Liberal Studies
- Steve Schlough: Lecturer, Communication, Education, and Training Department, School of Industry and Technology
- Marcia Snarski: Student
- Michael Stein: Student

The Team and Its Charge

The team was comprised of four faculty members, an instructional academic staff member, two support staff members, and three students. The group was directed to describe the ideal model of student computer competency development in relationship to our organizational goals and resources. The team was to examine relevant discipline data and data from specific groups (primarily students, alumni, and employers, but secondarily classroom teachers). The team was to develop a model and to establish an action plan for its implementation. In addition, the team was asked to assess its final products and procedures, identify any problems and adjust for contingencies. Finally, the team was charged with communicating their results to the various groups associated with student computer competencies.

The Process

The team represented a wide array of perspectives. The team was made up not primarily of computer experts, although several members had very high expertise, but of members who worked with students' computer skills in a variety of ways. The team established a sense of team work very early in the process, forged primarily during a two-day workshop held that fall to establish the particular nature of the problem and its boundaries and to map a strategy. They consulted with their sponsor to verify not only whether their work was being duplicated by other efforts on campus, but also to be certain about the levels of competency which

would be needed in their taxonomy--only beginning and exit-level, or mid-point as well--and the level of detail required to be known of secondary client groups such as instructors--is it necessary to know which skills are necessary in which areas, or what levels of support are necessary for instructional staff to utilize students' computer competencies? Upon receiving messages to simplify--just two levels--and leave some matters for follow-up--the instructional staff-- the group focused its perception of the client on students in their freshman year, program directors, employers, and alumni. The team felt confident in its ability to make a direct impact, since so many of its members had direct responsibility for computer training or utilization, and that the key to its success was in its ability to communicate its results in many directions and many channels. With the team facilitator to keep it on track, it delegated tasks easily and embarked on its task. The flow chart in Appendix A graphically depicts the process.

LITERATURE REVIEW

Computer literacy is no longer an option in today's job market. The role of computers in the workplace has expanded in recent years and it has become evident that experience in computer use will be a critical factor in achieving success in many fields. For students graduating from colleges and universities, it is essential to have skills in microcomputer applications in their chosen career field (Smith & Furst-Bowe, 1992). Business and industry are forming working relationships with learning institutions to provide real-world computer training. The number of students, employees and instructors requiring computer software training is growing at an enormous rate.

Much has been written about the use of computers as teaching tools in higher education and as productivity tools in business and industry. Educators seem to have abandoned the debate over whether computers should be introduced into the classroom and have turned their focus on the question of how computers can be used effectively in education (Lloyd & Gressard, 1984). Although computer skills among faculty members in higher education vary greatly, most instructors expect their students to have some degree of computer literacy when they enter the college classroom, (Hirschbuhl & Faseyitan, 1994).

Employers also expect newly-hired graduates to possess computer skills. In 1991, the Secretary's Commission on Achieving Necessary Skills (SCANS) identified several competencies needed for young people to compete in the labor market. These competencies included selecting computer systems, operating computers, using computers to process information, and solving problems with computer technology (The Secretary's Commission on Achieving Necessary Skills, 1991). According to the Commission, computational skills will be essential as virtually all employees will be required to maintain records, estimate results, use spreadsheets or apply statistical process controls as they negotiate, identify trends, or suggest new courses of action.

Although both college faculty members and employers expect students to possess computer skills, little research has been conducted to identify student skill levels in computer use as they enter or as they graduate from post-secondary institutions. Many factors could produce wide variations in the computer skill levels of college students. The computer skills of college students may vary depending on the courses they completed in high school and college, their academic major, the work experience they have had, and their personal interest in computers and computing (Smith & Furst-Bowe, 1992).

Some universities have conducted research to measure students' computer literacy, which refers to students' knowledge about computers

and computer operations. Other universities have studied how computer literacy affects students ability to use computers in the classroom and in the workplace (Strickland, 1989). In a study at the University of Virginia, it was found that levels of computer experience varied greatly among college students. This study indicated that students with more computer experience were significantly more confident in their use of computers than were students with little experience (Lloyd & Gressard, 1984).

A study conducted at Purdue University also tried to measure students' knowledge of and previous experience with computers. This study attempted to gain a systematic knowledge of students' computer backgrounds. The researcher found that although half the students surveyed had previous experience with computers, many of the students did not use computers regularly and had no motivation for using computers in their classes. It was recommended that more complete knowledge about students' computer literacy could help educators eliminate conception about students' abilities and develop curricula that more closely meets the needs of students (Sullivan, 1989).

Since 1985, students at Bentley College have been completing a questionnaire regarding their computing experience. The major trend indicated by these annual surveys is that the number of students with a background in programming is decreasing; however, the number of students with some background in productivity software, such as word processing, spreadsheet, and database management, is increasing. The results of this study have been used to tailor the school's computer courses to students' backgrounds (Harrington, 1990).

Finally, a study at the University of Wisconsin-Stout measured the computer skills of students in the fall of 1992. The results of this study suggested that the vast majority of students knew how to use computers and knew how to use word processing software. However, approximately one-half of the students had used spreadsheet or database management software and approximately one-third reported experience with computer programming. The majority of respondents reported that they had obtained their computer skills through high school and university courses, although nearly half the group had used computers in their homes (Smith & Furst-Bowe, 1992).

Additional studies have found that factors such as gender, age, experience, and interest in computers can affect students' attitudes toward and use of computers (Morahan-Martin, 1992). The findings of these and other studies suggests that additional research needs to be done to identify factors that could influence students' abilities to use computers. Few colleges or universities have any type of computer skills requirement or any kind of system to ensure that all students enter the

university or graduate from the university with the computer competencies necessary to be successful in the world of work.

METHODOLOGY

Subjects

To survey entering students at UW-Stout, 8 sections of second semester, Freshman English 102 courses were randomly sampled. Each section contained approximately 20 students, for a total sample of 157 students.

All 32 undergraduate program directors at UW-Stout were surveyed.

The UW-Stout Alumni Office provided the names of 50 randomly sampled, graduates of May of 1991. It was assumed that graduates from two years prior to the study would have had ample professional experience to provide informed response in the study.

The UW-Stout Placement Office provided the names of the last 100 campus recruiters entered into the computer database of approximately 1,925 employers who have recruited from the campus. It was hoped that the most recent database entries would not only provide representative employers, but also those with the most current interests in UW-Stout, and therefore most likely to respond to the survey.

Instruments

Cover letters to request participation by the various samples were the same, with the exception of the salutations which used individual names for program directors, alumni, and employers, but not for students. See Appendix B for a copy of the cover letter.

Instruments for the samples in the research contained the same basic content, with the exception of demographics and context which the samples were asked to consider in their responses. For instance, in regard to demographics, the students were asked where they obtained their computer skills and to identify their program of study. The program directors were asked to identify their program and their opinion of the importance of computer skills for their students. The alumni were asked questions such as how adequately they felt their education at UW-Stout prepared them for their current work and the type of organization in which they were currently employed. Employers were asked questions about their organization.

The computer competencies were grouped under Basic Computer Skills (12 items), Word Processing Skills (7 items), Spreadsheet Skills (6 items), Database Skills (7 items), Graphics/Multimedia Skills (6 items), and Information Retrieval/Telecommunications (5 items). For each competency the respondent was requested to indicate "Yes," "No," or "Unsure" for whether they could perform the task for students, whether students in their programs needed the skills for program directors, whether they needed the skills in their current position for alumni, and

whether their employees needed the skills for employers. See Appendices C through F for copies of the instruments.

The content for the questionnaires was created through discussion by the TQM team, review of previous research, and discussion with knowledgeable members of the UW-Stout community. Human Subjects consent form Number 1 (as suggested by Research Promotion Services) was included on each survey form.

Procedures

Surveys for students were passed out by instructors in their regularly scheduled classrooms to all students in attendance on February 14, 1994. Surveys for program directors were sent by campus mail on February 15, 1994. Alumni and employers were mailed surveys through the U.S. Postal Service on February 17 and 18, 1994.

Follow-up letters and questionnaires were mailed to program directors, alumni, and employers on March 15 and 16, 1994. All surveys which were completed were taken to Academic Computing Services on April 1, 1994 for data analysis.

Rate of Response

Completed surveys for 157 students in Freshman English classes were collected. This represented 100% of the students in attendance in the selected classes for the semester on the day administered. Twenty-seven (84%) of the population of 32 UW-Stout program directors completed and returned their questionnaires by April 1. Of the 100 employers who were sent questionnaires, 56 responded to the original mailing and 16 more to a follow-up mailing for a total sample of 72 (72%). Of the 50 alumni who were sent questionnaires, 21 responded initially and another 9 responded to a follow-up mailing for a total sample of 30 (60%). The responses from these various groups were considered adequate to represent them confidently.

RESULTS

This research addressed four main objectives:

a. Identify computer competencies of freshman students at UW-Stout
b. Identify computer competency expectations of students by undergraduate program directors
c. Identify computer competency expectations of graduates upon entering the work force as viewed by alumni
d. Identify computer competency expectations of graduates upon entering the work force as viewed by employers

These objectives were addressed within survey instruments which contained demographic items for each of the four research samples as well as 43 computer competencies presented within categories.

Core Computer Competencies

Table 1 presents the mean percent of "Yes" responses for each of the survey samples, organized by the main categories of competencies within the instrument. Since the number of items within categories of competencies varied, the mean percent of "Yes" responses enabled comparisons across categories and samples.

Table 1

Mean Percent of "Yes" Responses for Skill Categories

	STUDENTS (N=157)	PROG. DIR. (N=27)	ALUMNI (N=28)	EMPLOYERS (N=72)
BASIC SKILLS (1-12)	54	73	48	48
WORD PROCESSING (13-19)	71	69	53	49
SPREADSHEET (20-25)	38	62	40	54
DATABASE (26-32)	22	58	28	37
GRAPHICS/MULTIMEDIA (33-38)	34	65	35	28
INFO. RETRIEVAL/TELECOM. (39-43)	39	66	25	22
TOTAL OVERALL ITEMS (1-45)	44	65	40	40

Table 2 provides a more detailed account of respondents' skills and attitudes by presenting the percent of "Yes" responses for each of the samples for all 43 competencies. Analysis of these results provides insights into computer competencies to be addressed within the curriculum of the university. Although students' self reported skills are generally consistent with alumni and employers' expectations, careful attention is advised to the program directors' attitudes regarding skills they believe their students need to not only enter the work force but progress in the work force.

Table 2

Mean Percent of "Yes" Responses for Computer Skills

	STUDENTS (N=157)	PROG. DIR. (N=27)	ALUMNI (N=28)	EMPLOYERS (N=72)
BASIC SKILLS (1-12)				
1. Turn on Computer	99	100	93	89
2. Use Windows operating system	78	63	50	59
3. Use DOS commands	52	67	50	59
4. Use MacIntosh operating system	61	44	15	15
5. Format floppy disk	55	82	50	54
6. Start software program	54	96	68	56
7. Copy files	63	96	61	63
8. Manage hard drive (folders/directories)	63	78	64	53
9. Set up new personal computer from box	32	41	21	16
10. Install new software on computer	34	74	32	30
11. Teach yourself new software program	48	96	68	67
12. Set up computer network	12	32	07	00
WORD PROCESSING (13-19)				
13. A business letter	92	89	86	83
14. A research paper or proposal	95	96	57	60
15. A resume	75	85	71	49
16. A mail merge (form letters, mail labels)	47	44	32	31
17. An outline	87	82	54	68
18. A newsletter	72	48	39	27
19. A brochure or complex publication	31	37	32	14
SPREADSHEET (20-25)				
20. Enter data into existing spreadsheet	55	74	50	77
21. Create new spreadsheet	48	63	43	61
22. Create functions/formulas for spreadsht	35	59	43	51
23. Create charts/graphs from spreadsht data	38	70	43	49
24. Create macros for spreadsheet	20	44	21	29
25. Use database functions (e.g. sort, query)	31	63	39	54

DATABASE (26-32)				
26. Enter data into existing database	41	74	50	71
27. Create new database	26	70	29	37
28. Create functions/formulas for database	23	59	18	30
29. Create a database report	21	59	29	39
30. Sort and query a database	21	59	39	41
31. Use indexes/views to link databases	12	52	21	22
32. Do database programming	08	27	11	12
GRAPHICS/MULTIMEDIA (33-38)				
33. Draw simple shapes and objects	51	78	46	40
34. Use clip art	40	52	39	27
35. Draw complex objects/illustrations	26	63	21	10
36. Create charts, graphs, diagrams, flowchts	38	82	50	40
37. Create presentation materials, overheads	30	67	43	39
38. Create multimedia presentation	20	50	11	10
INFO. RETRIEVAL/TELECOM. (39-43)				
39. Send and receive electronic mail	47	78	44	61
40. Use electronic databases (PUBCAT, ERIC)	82	85	29	13
41. Use an electronic bulletin board	23	63	32	12
42. Locate and retrieve info over Internet	35	70	18	15
43. Set up a computer conference	09	33	04	03

As further perspective on desirable computer competencies, Table 3 presents the mean percent of "Yes" responses from alumni, indicating skills needed in their work, organized by skill categories on the questionnaire, for different types of organizations in which those alumni were employed. Faculty and program directors structuring curriculum targeted for particular types of employment might find these results of interest. It should be noted that for some types of organizations the sample sizes were very small.

Table 3

Mean Percent of Alumni "Yes" Responses for Skill Categories for Different Types of Organizations

	Basic Skills (1-12)	Word Proc. (13-19)	Spreadsheet (20-25)	Database (26-32)	Graphics (33-38)	Info/Tech (39-43)
Business	54	73	48	48	60	35
Education	46	50	17	17	39	20
Industrial Tech	66	57	78	52	39	33
Retail	25	43	00	00	00	40
Hospitality	29	71	17	00	00	30
Human Services	42	57	33	43	28	40
Art/Design	33	29	00	00	00	00
Food/Dietetics	83	43	100	100	50	00
Other	31	48	61	19	28	00

Table 4 presents the mean percent of "Yes" responses from employers, indicating skills needed in their employees, organized by skill categories on the questionnaire, for different types of organizations in which those employees worked. Faculty and program directors structuring curriculum which is targeted for particular types of employment might find these results of interest. It should be noted that for some types of organizations the sample sizes were very small.

Table 4

Mean Percent of Employers "Yes" Responses for Skill Categories for Different Types of Organizations

	Basic Skills (1-12)	Word Proc. (13-19)	Spreadsheet (20-25)	Database (26-32)	Graphics (33-38)	Info/Tech (39-43)
Business	56	44	61	43	35	14
Education	92	86	83	71	100	100
Industrial Tech	57	53	97	50	44	20
Retail	32	48	14	06	12	26
Hospitality	38	51	58	40	21	13
Human Services	45	46	21	36	04	20
Art/Design						
Food/Dietetics	37	41	38	33	24	43
Other	64	56	65	43	35	23
Multiple Response	00	57	17	14	00	20

In addition to the 43 specific competencies addressed in the questionnaire, item 44 asked whether students and alumni had computer programming skills and whether program directors and employers of our

students thought our students should have programming skills. Item 45 asked whether students and alumni had other computer skills not specifically covered in the instrument and whether program directors and employers thought our students should have other skills not specifically covered. Table 5 reports those results.

Table 5

Programming and Other Computer Skills
% Yes Responses

	Students	Alumni	Program Directors	Employers
Programming	32	21	19	11
Other Skills	30	43	68	15

Importance of Computer Skills for Employment

Table 6 reports students' and program directors' views regarding the importance of computer skills for employment.

Ta

Importance of Computer Skills for Employment

	Student%	Program Director%
Essential	41	67
Very important	27	26
Somewhat important	23	07
Not important	02	00
Unsure	07	00

Where Computer Skills are Obtained

Table 7 describes where students and program directors indicated that students acquire their computer skills.

Table 7

Where Skills are Obtained

	Student%	Program Director%
Only in High School	45	67
UW-Stout	16	85
Work Experience	19	67
At home	23	Not asked
Other	11	26
High school and other	66	unknown

Other Student Survey Results

Of the students who completed the demographic portion of their questionnaires (n=154), 55% (84) were female and 45% (70) were male. Table 8 describes their class ranks.

Table 8

Students' Class Ranks

	N	%
Freshmen	86	55
Sophomores	31	20
Juniors	22	14
Seniors	15	10

Table 9 shows the degree programs represented by the sample of students.

Table 9

Students Programs of Study

	N	%
Business	16	10
Education	26	17
Industrial Technology	26	17
Retail	10	07
Hospitality	20	13
Human Services	13	08
Art/Design	08	05
Food/Dietetics	03	02
Math/Engineering	06	04
Other	07	05
Multiple Responses	19	12

Thirty-seven percent (n=55) of the students owned computers, while 63% (n=95) did not. The kinds of computers owned by the students are reported in Table 10 A.

Table 10 A

Student Computer Ownership

	N	%
Yes/IBM	28	51
Yes/Mac	15	27
Yes/Other	11	20
Mac & other	01	02

Table 10 B reports the competencies for students who owned their own computers in comparison to those who did not.

Table 10 B

Mean Percent "YES" Responses by Categories for Student Computer Owners and Non-Owners

	Basics (1-12)	WP (13-19)	SS (20-25)	DB (23-32)	Graphics (33-38)	Info/Tech (39-43)	Total (1-45)
Owners (n=55)	68	78	48	32	49	49	56
Non-Owners (n=95)	46	67	32	16	24	34	37
Chi Sq. (df=1)	23.65	2.22	9.44	23.50	29.53	16.741	80.50
p<	.001	NS	.01	.001	.001	.001	.001

Other Program Director Results

Seventy-four percent of the undergraduate program directors stated that they require courses in computers within the curriculum of their programs. As was reported earlier, 93% of them felt that computer skills were either essential or very important for graduates of their programs. All of them felt that computer skills were at least somewhat important for their students. Table 11 reports when program directors believed that computer skills should be acquired by the students in their programs. The lack of consensus suggests differences among programs and specific computer expectations.

TABLE 11
When Students Need Computer Skills

	N
When they enter program	38
When program 1/2 completed	31
Graduation	31

Other Alumni Results

Table 12 reports the types of organizations represented by the alumni respondents and Table 13 describes the sizes of their organizations.

TABLE 12
Types of Alumni Organizations

	N	%
Business	07	26
Education	06	22
Industrial Tech.	03	11
Retail	01	04
Hospitality	02	07
Human Services	03	04
Art/Design	01	04
Food/Dietetics	01	04
Other	03	11

TABLE 13
Sizes of Alumni Organizations

	N	%
>10,000	02	07
5,001-10,000	03	04
1,001-5,000	02	07
501-1,000	02	07
100-500	08	30
<100	12	44

Types of computers used by alumni are reported in Table 14.

TABLE 14
Types of Computers Used by Alumni

	N	%
IBM	16	59
Mac	01	04
Other	02	07
IBM + Mac	04	15
IBM + Other	02	07
Mac + Other	02	07

Other Employer Results

Table 15 reports the types of organizations represented by the employer respondents and Table 16 describes the sizes of their organizations.

TABLE 15
Types of Employers' Organizations (n=69)

	N	%
Business	16	23
Education	01	01
Industrial Tech	06	09
Retail	08	12
Hospitality	12	17
Human Services	04	06
Food/Dietetics	07	10
Other	14	20
Multiple Response	01	01

TABLE 16
Sizes of Employers' Organizations (n=70)

	N	%
>10,000	08	11
5,001-10,000	03	04
1,001-5,000	13	19
501-1,000	08	11
100-500	13	19
<100	25	36

Types of computers used by employers in this study are reported in Table 17.

TABLE 17
Types of Computers Used by Employers (n=69)

	N	%
IBM	43	62
Mac	01	01
Other	10	15
IBM + Mac	09	13
IBM + Other	03	04
IBM, Mac + Other	03	04

RECOMMENDATIONS

Primary Recommendation

The primary goal of the team was to determine a core set of skills that all UW-Stout graduates should be able to perform. The first step in this process was to identify the skills that were rated as being needed by 50% or more of at least two of the following populations: program directors, alumni, and employers. After identifying these skills the team discussed these skills and other related skills. The team then reached a consensus on the following primary recommendation:

Upon graduation, at a minimum, all UW-Stout graduates will be able to perform the following computer skills:

- Use MS-DOS® commands and the Windows™ interface
- Manage files on a hard disk
- Learn to use a program with the documentation provided
- Computer generate business letters and research reports
- Create a spreadsheet that includes formulas
- Create, sort, and query a database
- Create charts, graphs, and flow charts
- Send and retrieve electronic mail

In addition to these skills, UW-Stout graduates will possess a variety of computer skills specific to their major or program.

Recommendations for Implementation

The team then developed three recommendations to assure that students acquired these skills. The steps are as follows:

- Publish and advertise a list of computer competencies all UW-Stout graduates should have.
- Identify computer competencies acquired in courses.
- Implement a process that will assure, before graduation, that a student has taken courses that contain required skills or that the student has demonstrated proficiency in anotner manner.

The recommendations for implementation were presented to the team sponsor, Provost Depuy. The sponsor agreed to take responsibility for the implementation. The time line in Appendix G gives approximate dates for the implementation process.

Additional Recommendations

The team also had a variety of recommendations that will help students acquire computer skills and implement a successful process. These recommendations follow:

- Encourage those students coming in with a less than adequate computer background to take a basic skills course to acquire basic word processing, spreadsheet, and database skills.
- Conduct hands-on skills testing of a sample of students at all levels.
- Encourage instructors to incorporate computer usage into their curriculum.
- Encourage students to attend existing workshops.
- Continue to update the computer facilities to enhance usage.
- Encourage student ownership of computers.
- Continued follow-up on basic computer competencies. The skill list needs to be monitored and updated.
- Set an implementation time line.
- Disseminate recommendations internally and externally .
- The team sponsor should convene and update the team.

DISSEMINATION

The recommendations in the previous section were disseminated in the following ways.

The team presented the project to the TQLC on May 2, 1994 and distributed copies of the final report to its members.

Copies of the full report were also distributed to the Vice Chancellor's Council, Curriculum and Instruction Committee, and program directors. A two-page executive summary was distributed to all faculty/staff at UW-Stout.

Dissemination outside of the UW-Stout community was provided through a presentation at the ASCUE Convention in Myrtle Beach, South Carolina on June 15, 1994.

It is also proposed that team members will present their recommendations to select audiences through 1994-95 and submit articles to relevent publications.

ANALYSIS OF THE GROUP DYNAMICS

Structure

The group utilized both a group leader and a facilitator. One of the most positive elements of our group leader and facilitator was that they were not directly involved in the basic skills and computer areas. This avoided the common problem of a leader or facilitator having a vested interest in the outcome of the committee. Instead these individuals allowed the committee to explore the different avenues that were identified during the committee meetings.

Our facilitator contributed a great deal to the efficiency and effectiveness of the committee structure. The facilitator would constantly remind the committee of its mission, what was previously decided, and acted as a referee when the committee members were debating about the goals and objectives of the committee. Another contribution of the facilitator was her ability to keep the committee focused. The skills of the facilitator and the group leader were very impressive to the other members of the committee.

The other group members included representatives within different academic areas, students, and staff members of the learning center. By the sheer diversity of this group, it prevented any single philosophy or opinion to dominate the discussion. However, this difference between group members did allow for lively and sometimes heated discussion without being detrimental to the overall effectiveness of the committee.

There was also a sense of trust and respect among the group members that promoted very honest discussions during the committee meetings. Everyone voiced their opinions because the group was very supportive of the other members.

TQM Structure

There were different aspects of the TQM process that was implemented by the group members. The use of a facilitator and group leader was extremely important to allow the group to meet their goals and objectives. The group developed a process (strategic plan) to determine the basic computer skills needed by UW-Stout students. This process included sending surveys to students, program directors, alumni, and businesses who have hired graduates of UW-Stout.

This information was then utilized to make recommendations on the basic skills needed by the UW-Stout students. The group did not focus on how the recommendations would be perceived by the administration nor the faculty. Instead the committee focused on what was needed and the process that needed to be implemented to ensure that our students will receive the proper training in the computer area.

The committee agreed that the TQM process would not have been successful without the group becoming cohesive and trusting one another. One of the key elements is the trust between the group members and their sponsor. Overall the committee felt that their sponsor was responsive to the needs of the committee. However, there is some skepticism that the recommendations of the committee will not be implemented. To fully utilize the TQM process, the recommendations made by the committee should be implemented or the rationale be given to the committee as to why the recommendations can not be implemented. Deming has argued that if the recommendations are not implemented or strongly considered, a level of mistrust will be developed between the administration and faculty.

The committee also changed their opinion about the necessity of utilizing the TQM tools by the committee. At the very beginning, the committee felt that some of the TQM tools should be utilized. These tools assisted in identifying the process, goals, and objectives of the committee. However, after these different areas were determined the use of TQM tools was not needed. This was contributed to the fact that the committee had a clear focus of the goals and objectives of the committee.

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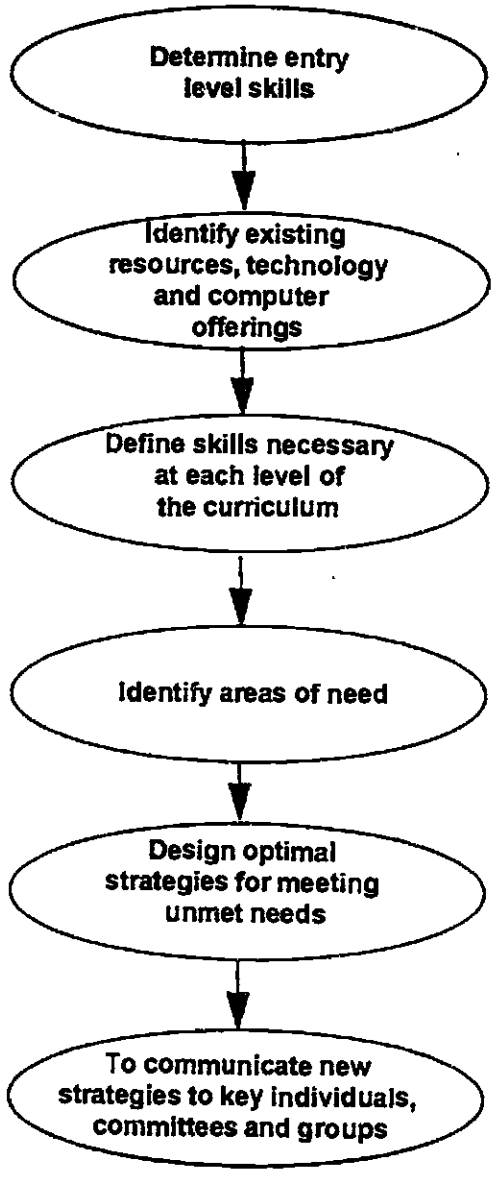
Appendix A

To design and assess a model of computer competences necessary at different levels of the curriculum and for post graduate success



Appendix B

February 15, 1994

address~

Dear company rep~:

As you know, computer technologies have changed the ways we work and live, and those technologies themselves continue to change. These changes pose important challenges to UW-Stout and other schools.

In an effort to continuously improve the quality of education provided at UW-Stout, a Quality Improvement Team of administrators, faculty, and students has been given the responsibilities of identifying the computer competencies acquired by students at UW-Stout and those competencies expected by employers of our graduates. To accomplish those goals we are surveying a sample of our freshmen students, a sample of our recent graduates, the program directors of all academic programs at UW-Stout, and a sample of employers who have recruited and hired our graduates.

By examining the responses of these various groups, we should be able to describe more specifically what we at UW-Stout need to provide our students to make them competitive in computer technologies in today's work place.

Because you represent one of the above groups, you have been selected for participation in this research effort. Whether you have never touched a computer, or are an expert at computing, we need your feedback for this project.

Please take the ten minutes necessary to complete the following questionnaire and then return it to us by March 1, 1994. Of course your response will be confidential. The number code on your questionnaire is to identify nonrespondents for follow-up activities. Thank you for your cooperation in helping us improve the quality of education at UW-Stout.

Sincerely,

Vice Chancellor DePuy
Team Sponsor

Steve Schlough
Team Leader

jm

enclosure

Appendix C

UW-Stout Employer Computer Survey

Please read the following questions and circle your responses All responses are confidential and will be used as part of a total quality management project involving student computer skills.

Basic Computer Skills

Do the UW-Stout graduates you hire need to be able to:

1. Turn on/off a computer, monitor and printer	A. Yes	B. No	C. Unsure
2. Use the Windows operating system	A. Yes	B. No	C. Unsure
3. Use DOS commands	A. Yes	B. No	C. Unsure
4. Use the Macintosh operating system	A. Yes	B. No	C. Unsure
5. Format a floppy disk	A. Yes	B. No	C. Unsure
6. Start a software program	A. Yes	B. No	C. Unsure
7. Copy files	A. Yes	B. No	C. Unsure
8. Manage a hard drive (using folders/directories)	A. Yes	B. No	C. Unsure
9. Set up a new personal computer (from box)	A. Yes	B. No	C. Unsure
10. Install new software on a computer	A. Yes	B. No	C. Unsure
11. Learn new software programs	A. Yes	B. No	C. Unsure
12. Set up a computer network	A. Yes	B. No	C. Unsure

Word Processing Skills

Do the UW-Stout graduates you hire need to be able to create:

13. A business letter	A. Yes	B. No	C. Unsure
14. A research paper or proposal	A. Yes	B. No	C. Unsure
15. A resume	A. Yes	B. No	C. Unsure
16. A mail merge (for form letters, mailing labels)	A. Yes	B. No	C. Unsure
17. An outline	A. Yes	B. No	C. Unsure
18. A newsletter	A. Yes	B. No	C. Unsure
19. A brochure or complex publication	A. Yes	B. No	C. Unsure

Spreadsheet Skills

Do the UW-Stout graduates you hire need to be able to:

20. Enter data into an existing spreadsheet	A. Yes	B. No	C. Unsure
21. Create a new spreadsheet	A. Yes	B. No	C. Unsure
22. Create functions and formulas for a spreadsheet	A. Yes	B. No	C. Unsure
23. Create charts and graphs from spreadsheet data	A. Yes	B. No	C. Unsure
24. Create macros for a spreadsheet	A. Yes	B. No	C. Unsure
25. Use database functions (e.g. sort, query)	A. Yes	B. No	C. Unsure

Database Skills

Do the UW-Stout graduates you hire need to be able to:

26. Enter data into an existing database	A. Yes	B. No	C. Unsure
27. Create a new database	A. Yes	B. No	C. Unsure
28. Create functions and formulas for a database	A. Yes	B. No	C. Unsure
29. Create a database report	A. Yes	B. No	C. Unsure
30. Sort and query a database	A. Yes	B. No	C. Unsure
31. Use indexes and views to link databases	A. Yes	B. No	C. Unsure
32. Do database programming	A. Yes	B. No	C. Unsure

Graphics/Multimedia Skills

Do the UW-Stout graduates you hire need to be able to:

33. Draw simple shapes and objects	A. Yes	B. No	C. Unsure
34. Use clip art	A. Yes	B. No	C. Unsure
35. Draw complex objects and create illustrations	A. Yes	B. No	C. Unsure
36. Create charts, graphs, diagrams and flowcharts	A. Yes	B. No	C. Unsure
37. Create presentation materials (overheads)	A. Yes	B. No	C. Unsure
38. Create a multimedia presentation	A. Yes	B. No	C. Unsure

Information Retrieval/Telecommunications

Do the UW-Stout graduates you hire need to be able to:

39. Send and receive electronic mail	A. Yes	B. No	C. Unsure
40. Use electronic databases (PUBCAT, ERIC)	A. Yes	B. No	C. Unsure
41. Use an electronic bulletin board	A. Yes	B. No	C. Unsure
42. Locate and retrieve information over Internet	A. Yes	B. No	C. Unsure
43. Set up a computer conference	A. Yes	B. No	C. Unsure

Programming

44. Do the graduates you hire need computer programming skills?

A. Yes B. No C. Unsure

Please list the computer programming languages that your employees use:

_____

Other Computer Skills

45. Do graduates you hire need to have any other computer skills or know how to use other types of computer programs? A. Yes B. No C. Unsure

Please list or explain.

_____

_____

Employer Information

46. Title of person completing the survey _____

47. Type of Organization

a. Business b Education c. Industrial Technology
d. Retail e. Hospitality f. Human Services
g. Art/Design h. Food/Dietetics i. Math/Engineering
j. Other (list)_____

48. Size of Organization

a. 10,000+ employees b. 5,000-10,000 employees
c. 1,000 - 5,000 employees d. 500 - 1,000 employees
e. 100 - 500 employees f. less than 100 employees

49. Types of Computers Used a. IBM b. Macintosh c. Other _____

Thank you for completing this questionnaire. Please return this survey in the enclosed envelope to Steve Schlough, Academic Staff Senate Office, 42 Harvey Hall , UW-Stout, Menomonie, WI 54751. Phone (715) 232-1352. Fax: (715) 232-1527.

NOTE: You understand that by returning this questionnaire, you are giving informed consent as a participating volunteer in this study. You also understand the basic nature of the study and agree that any potential risks are exceedingly small. You also realize that potential benefits may be realized from the completion of the study. You are also aware that the information is being sought in a specific manner so that no identifiers are needed and so that confidentiality is guaranteed. You realize that you have the right to refuse to participate and that you have the right to withdraw from participation at any time during the study. This right will be respected with no coercion or prejudice. Questions or concerns about participation in the research or subsequent complaints should be addressed first to the researcher and second to Dr. Ted Knous, Chair, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 410 BH, UW-Stout, Menomonie, WI 54751.

Appendix D

UW-Stout Alumni Computer Survey

Please read the following questions and circle your responses. All responses are confidential and will be used as part of a total quality management project involving student computer skills.

Basic Computer Skills

In your present position, do you need to be able to:

1. Turn on/off a computer, monitor and printer	A. Yes	B. No	C. Unsure
2. Use the Windows operating system	A. Yes	B. No	C. Unsure
3. Use DOS commands	A. Yes	B. No	C. Unsure
4. Use the Macintosh operating system	A. Yes	B. No	C. Unsure
5. Format a floppy disk	A. Yes	B. No	C. Unsure
6. Start a software program	A. Yes	B. No	C. Unsure
7. Copy files	A. Yes	B. No	C. Unsure
8. Manage a hard drive (using folders/directories)	A. Yes	B. No	C. Unsure
9. Set up a new personal computer (from box)	A. Yes	B. No	C. Unsure
10. Install new software on a computer	A. Yes	B. No	C. Unsure
11. Learn new software programs	A. Yes	B. No	C. Unsure
12. Set up a computer network	A. Yes	B. No	C. Unsure

Word Processing Skills

In your present position, do you need to be able to create:

13. A business letter	A. Yes	B. No	C. Unsure
14. A research paper or proposal	A. Yes	B. No	C. Unsure
15. A resume	A. Yes	B. No	C. Unsure
16. A mail merge (for form letters, mailing labels)	A. Yes	B. No	C. Unsure
17. An outline	A. Yes	B. No	C. Unsure
18. A newsletter	A. Yes	B. No	C. Unsure
19. A brochure or complex publication	A. Yes	B. No	C. Unsure

Spreadsheet Skills

In your present position, do you need to be able to:

20. Enter data into an existing spreadsheet	A. Yes	B. No	C. Unsure
21. Create a new spreadsheet	A. Yes	B. No	C. Unsure
22. Create functions and formulas for a spreadsheet	A. Yes	B. No	C. Unsure
23. Create charts and graphs from spreadsheet data	A. Yes	B. No	C. Unsure
24. Create macros for a spreadsheet	A. Yes	B. No	C. Unsure
25. Use database functions (e.g. sort, query)	A. Yes	B. No	C. Unsure

Database Skills

In your present position, do you need to be able to:

26. Enter data into an existing database	A. Yes	B. No	C. Unsure
27. Create a new database	A. Yes	B. No	C. Unsure
28. Create functions and formulas for a database	A. Yes	B. No	C. Unsure
29. Create a database report	A. Yes	B. No	C. Unsure
30. Sort and query a database	A. Yes	B. No	C. Unsure
31. Use indexes and views to link databases	A. Yes	B. No	C. Unsure
32. Do database programming	A. Yes	B. No	C. Unsure

Graphics/Multimedia Skills

In your present position, do you need to be able to:

33. Draw simple shapes and objects	A. Yes	B. No	C. Unsure
34. Use clip art	A. Yes	B. No	C. Unsure
35. Draw complex objects and create illustrations	A. Yes	B. No	C. Unsure
36. Create charts, graphs, diagrams and flowcharts	A. Yes	B. No	C. Unsure
37. Create presentation materials (overheads)	A. Yes	B. No	C. Unsure
38. Create a multimedia presentation	A. Yes	B. No	C. Unsure

Information Retrieval/Telecommunications

In your present position, do you need to be able to:

39. Send and receive electronic mail	A. Yes	B. No	C. Unsure
40. Use electronic databases (PUBCAT, ERIC)	A. Yes	B. No	C. Unsure
41. Use an electronic bulletin board	A. Yes	B. No	C. Unsure
42. Locate and retrieve information over Internet	A. Yes	B. No	C. Unsure
43. Set up a computer conference	A. Yes	B. No	C. Unsure

Programming

44. In your present position, do you need computer programming skills?
A. Yes B. No C. Unsure

Please list the computer programming languages that you use:

_____

Other Computer Skills

45. In your current position, do you need to have any other computer skills or know how to use other types of computer programs? A. Yes B. No C. Unsure

Please list or explain

_____

_____

Alumni Information

46. Current Title _____

47. Type of Organization
a. Business b Education c. Industrial Technology
d. Retail e. Hospitality f. Human Services
g. Art/Design h. Food/Dietetics i. Math/Engineering
j. Other (list)_____

48. Size of Organization
a. 10,000+ employees b. 5,000-10,000 employees
c. 1,000 - 5,000 employees d. 500 - 1,000 employees
e. 100 - 500 employees f. less than 100 employees

49. Types of Computers Used a. IBM b. Macintosh c. Other _____

Thank you for completing this questionnaire. Please return this survey in the enclosed envelope to Steve Schlough, Academic Staff Senate Office, 42 Harvey Hall , UW-Stout, Menomonie, WI 54751. Phone: (715) 232-1352. Fax: (715) 232-1527.

NOTE: You understand that by returning this questionnaire, you are giving informed consent as a participating volunteer in this study. You also understand the basic nature of the study and agree that any potential risks are exceedingly small. You also realize that potential benefits may be realized from the completion of the study. You are also aware that the information is being sought in a specific manner so that no identifiers are needed and so that confidentiality is guaranteed. You realize that you have the right to refuse to participate and that you have the right to withdraw from participation at any time during the study. This right will be respected with no coercion or prejudice. Questions or concerns about participation in the research or subsequent complaints should be addressed first to the researcher and second to Dr. Ted Knous, Chair, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 410 BH, UW-Stout, Menomonie, WI 54751.

Appendix E

Student Computer Survey

Please read the following questions and place your responses on the blue answer sheet. All responses are confidential and will be used to improve the quality of computer instruction at UW-Stout.

Basic Computer Skills

Are you able to:

1. Turn on/off a computer, monitor and printer	A. Yes	B. No	C. Unsure
2. Use the Windows operating system	A. Yes	B. No	C. Unsure
3. Use DOS commands	A. Yes	B. No	C. Unsure
4. Use the Macintosh operating system	A. Yes	B. No	C. Unsure
5. Format a floppy disk	A. Yes	B. No	C. Unsure
6. Start a software program	A. Yes	B. No	C. Unsure
7. Copy files	A. Yes	B. No	C. Unsure
8. Manage a hard drive (using folders/directories)	A. Yes	B. No	C. Unsure
9. Set up a new personal computer (from box)	A. Yes	B. No	C. Unsure
10. Install new software on a computer	A. Yes	B. No	C. Unsure
11. Teach yourself a new software program	A. Yes	B. No	C. Unsure
12. Set up a computer network	A. Yes	B. No	C. Unsure

Word Processing Skills

Using a word processing software program (such as WordPerfect), are you able to create:

13. A business letter	A. Yes	B. No	C. Unsure
14. A research paper or proposal	A. Yes	B. No	C. Unsure
15. A resume	A. Yes	B. No	C. Unsure
16. A mail merge (for form letters, mailing labels)	A. Yes	B. No	C. Unsure
17. An outline	A. Yes	B. No	C. Unsure
18. A newsletter	A. Yes	B. No	C. Unsure
19. A brochure or complex publication	A. Yes	B. No	C. Unsure

Spreadsheet Skills

Using a spreadsheet software package (such as Lotus 1-2-3), can you:

20. Enter data into an existing spreadsheet	A. Yes	B. No	C. Unsure
21. Create a new spreadsheet	A. Yes	B. No	C. Unsure
22. Create functions and formulas for a spreadsheet	A. Yes	B. No	C. Unsure
23. Create charts and graphs from spreadsheet data	A. Yes	B. No	C. Unsure
24. Create macros for a spreadsheet	A. Yes	B. No	C. Unsure
25. Use database functions (e.g. sort, query)	A. Yes	B. No	C. Unsure

Database Skills

Using a database software package (such as dBase), can you:

26. Enter data into an existing database	A. Yes	B. No	C. Unsure
27. Create a new database	A. Yes	B. No	C. Unsure
28. Create functions and formulas for a database	A. Yes	B. No	C. Unsure
29. Create a database report	A. Yes	B. No	C. Unsure
30. Sort and query a database	A. Yes	B. No	C. Unsure
31. Use indexes and views to link databases	A. Yes	B. No	C. Unsure
32. Do database programming	A. Yes	B. No	C. Unsure

Graphics/Multimedia Skills

Using a graphics software package (such as Harvard Graphics), can you:

33. Draw simple shapes and objects	A. Yes	B. No	C. Unsure
34. Use clip art	A. Yes	B. No	C. Unsure
35. Draw complex objects and create illustrations	A. Yes	B. No	C. Unsure
36. Create charts, graphs, diagrams and flowcharts	A. Yes	B. No	C. Unsure
37. Create presentation materials (overheads)	A. Yes	B. No	C. Unsure
38. Create a multimedia presentation	A. Yes	B. No	C. Unsure

Information Retrieval/Telecommunications

Using information retrieval resources and telecommunications software, can you:

39. Send and receive electronic mail	A. Yes	B. No	C. Unsure
40. Use electronic databases (PUBCAT, ERIC)	A. Yes	B. No	C. Unsure
41. Use an electronic bulletin board	A. Yes	B. No	C. Unsure
42. Locate and retrieve information over Internet	A. Yes	B. No	C. Unsure
43. Set-up a computer conference	A. Yes	B. No	C. Unsure

Programming

44. Do you have computer programming skills? A. Yes B. No C. Unsure

Please list below the computer programming languages that you can use:

_____

Other Computer Skills

45. Do you have any other computer skills or know how to use other types of computer programs?

A. Yes B. No C. Unsure

Please list or explain in the space below.

_____

_____

46. Where did you obtain your computer skills?

a. high school courses
b. UW-Stout courses
c. through your work experiences
d. at home
e. other (please list) _____

47. How important is it to have computer skills to obtain employment in your chosen major?

a. it is essential
b. it is very important
c. it is somewhat important
d. it is not important
e. unsure

Student Information

Please complete the following:

48. Year in School — a. Freshman b. Sophomore c. Junior d. Senior

49. Gender — a. Female b. Male

Program/Career Area *(choose one in either 50 or 51)*

50. a. Business b Education c. Industrial Technology d. Retail e. Hospitality

51. a. Human Services b. Art/Design c. Food/Dietetics d. Math/Engineering e. Other (list)_____

52. Do you own a computer? a. Yes (IBM) b. Yes (Mac) c. Yes (other brand) d. No

Thank you for completing this survey. Please return this survey to your instructor.

NOTE: You understand that by returning this questionnaire, you are giving informed consent as a participating volunteer in this study. You also understand the basic nature of the study and agree that any potential risks are exceedingly small. You also realize that potential benefits may be realized from the completion of the study. You are also aware that the information is being sought in a specific manner so that no identifiers are needed and so that confidentiality is guaranteed. You realize that you have the right to refuse to participate and that you have the right to withdraw from participation at any time during the study. This right will be respected with no coercion or prejudice. Questions or concerns about participation in the research or subsequent complaints should be addressed first to the researcher and second to Dr. Ted Knous, Chair, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 410 BH, UW-Stout, Menomonie, WI 54751.

Appendix F

UW-Stout Program Director Computer Survey

Please read the following questions and circle your responses. All responses are confidential and will be used as part of a total quality management project involving student computer skills.

Basic Computer Skills

Do students in your program need to be able to:

1. Turn on/off a computer, monitor and printer	A. Yes	B. No	C. Unsure
2. Use the Windows operating system	A. Yes	B. No	C. Unsure
3. Use DOS commands	A. Yes	B. No	C. Unsure
4. Use the Macintosh operating system	A. Yes	B. No	C. Unsure
5. Format a floppy disk	A. Yes	B. No	C. Unsure
6. Start a software program	A. Yes	B. No	C. Unsure
7. Copy files	A. Yes	B. No	C. Unsure
8. Manage a hard drive (using folders/directories)	A. Yes	B. No	C. Unsure
9. Set up a new personal computer (from box)	A. Yes	B. No	C. Unsure
10. Install new software on a computer	A. Yes	B. No	C. Unsure
11. Learn new software programs	A. Yes	B. No	C. Unsure
12. Set up a computer network	A. Yes	B. No	C. Unsure

Word Processing Skills

Do students in your program need to be able to create:

13. A business letter	A. Yes	B. No	C. Unsure
14. A research paper or proposal	A. Yes	B. No	C. Unsure
15. A resume	A. Yes	B. No	C. Unsure
16. A mail merge (for form letters, mailing labels)	A. Yes	B. No	C. Unsure
17. An outline	A. Yes	B. No	C. Unsure
18. A newsletter	A. Yes	B. No	C. Unsure
19. A brochure or complex publication	A. Yes	B. No	C. Unsure

Spreadsheet Skills

Do students in your program need to be able to:

20. Enter data into an existing spreadsheet	A. Yes	B. No	C. Unsure
21. Create a new spreadsheet	A. Yes	B. No	C. Unsure
22. Create functions and formulas for a spreadsheet	A. Yes	B. No	C. Unsure
23. Create charts and graphs from spreadsheet data	A. Yes	B. No	C. Unsure
24. Create macros for a spreadsheet	A. Yes	B. No	C. Unsure
25. Use database functions (e.g. sort, query)	A. Yes	B. No	C. Unsure

Database Skills

Do students in your program need to be able to:

26. Enter data into an existing database	A. Yes	B. No	C. Unsure
27. Create a new database	A. Yes	B. No	C. Unsure
28. Create functions and formulas for a database	A. Yes	B. No	C. Unsure
29. Create a database report	A. Yes	B. No	C. Unsure
30. Sort and query a database	A. Yes	B. No	C. Unsure
31. Use indexes and views to link databases	A. Yes	B. No	C. Unsure
32. Do database programming	A. Yes	B. No	C. Unsure

Graphics/Multimedia Skills

Do students in your program need to be able to:

33. Draw simple shapes and objects	A. Yes	B. No	C. Unsure
34. Use clip art	A. Yes	B. No	C. Unsure
35. Draw complex objects and create illustrations	A. Yes	B. No	C. Unsure
36. Create charts, graphs, diagrams and flowcharts	A. Yes	B. No	C. Unsure
37. Create presentation materials (overheads)	A. Yes	B. No	C. Unsure
38. Create a multimedia presentation	A. Yes	B. No	C. Unsure

Information Retrieval/Telecommunications

Do students in your program need to be able to:

39. Send and receive electronic mail	A. Yes	B. No	C. Unsure
40. Use electronic databases (PUBCAT, ERIC)	A. Yes	B. No	C. Unsure
41. Use an electronic bulletin board	A. Yes	B. No	C. Unsure
42. Locate and retrieve information over Internet	A. Yes	B. No	C. Unsure
43. Set up a computer conference	A. Yes	B. No	C. Unsure

Programming

44. Do students in your program need computer programming skills?
A. Yes B. No C. Unsure

Please list the programming languages that your students use:

_____

Other Computer Skills

45. Do students in your program need to have any other computer skills or know how to use other types of computer programs? A. Yes B. No C. Unsure

Please list or explain

_____

Program Director Information

46. Title of Program _____

47. When do students need to have the computer skills necessary for your program?
a. when they enter the program
b. by the time they have half their program completed or begin upper division courses
c. by the time they graduate

48. Where do students in your program obtain their computer skills?
a. in high school
b. in courses at UW-Stout
c. through their work experiences
d. other (please explain)_____

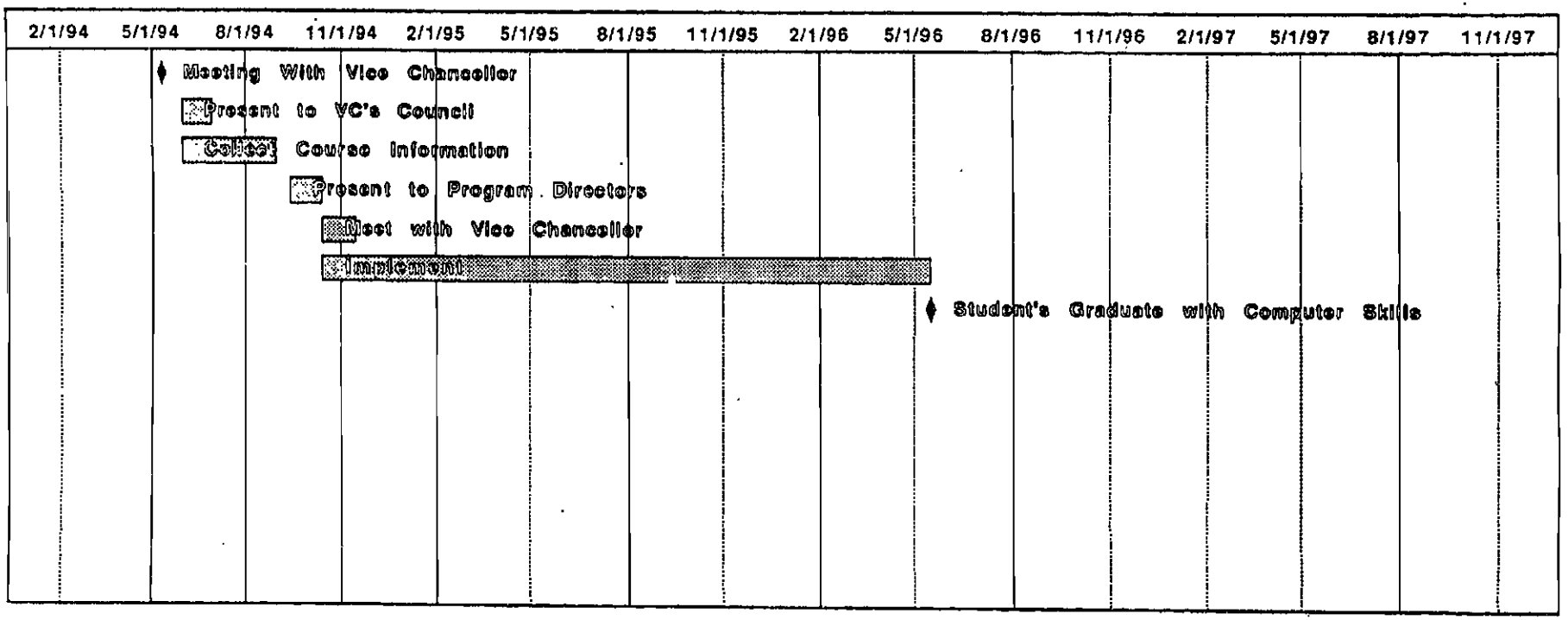
49. Does your program require computer courses? a. Yes b. No

50. How important is it for graduates of your program to have computer skills to obtain employment?
a. Essential
b. Very important
c. Somewhat important
d. Not important

Thank you for taking the time to complete this questionnaire. Please return this survey to Steve Schlough, Academic Staff Senate Office, 42 Harvey Hall.

NOTE: You understand that by returning this questionnaire, you are giving informed consent as a participating volunteer in this study. You also understand the basic nature of the study and agree that any potential risks are exceedingly small. You also realize that potential benefits may be realized from the completion of the study. You are also aware that the information is being sought in a specific manner so that no identifiers are needed and so that confidentiality is guaranteed. You realize that you have the right to refuse to participate and that you have the right to withdraw from participation at any time during the study. This right will be respected with no coercion or prejudice. Questions or concerns about participation in the research or subsequent complaints should be addressed first to the researcher and second to Dr. Ted Knous, Chair, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 410 BH, UW-Stout, Menomonie, WI 54751.

Appendix G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Meeting With Vice Chancellor
Present to VC's Council
Collect Course Information
Present to Program Directors
Meet with Vice Chancellor
Implement
Student's Graduate with Computer Skills