Adding an Essential Learning Tool in a Recreation Curriculum: Computer Education

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Abstract

One of the major goals of recreation curricula is to prepare undergraduates in professional knowledge and skills. There is an increasing need for students to be proficient and have an understanding of computer applications. Thus, educators have a new challenge of incorporating computer training in curricula. This paper outlines a computer infusion effort and accompanying evaluation study which is underway in a large undergraduate recreation program. A quasi-experimental design was used including pretests and posttests, as well as experimental and control groups. Results show students enrolled in computer infused recreation classes improved significantly on several indicators such as self-rated performance on software applications, importance ratings of applications, and attitudes toward computers. Students in existing classes did not have the same improvements. Practical suggestions for educators to integrate computer training are provided.

Key words: Computer education, Evaluation, Attitude, Self-rated performance scales

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Introduction

The advent and growth of computers in the last ten years may have caused educators and curricula to change. Classes which have traditionally used lecture, discussion, guest

speaker, and cooperative learning formats may be changing to computers as teaching tools or the study of computers as a topic for a class. For example, computers are teaching tools when computer-generated presentations are used. Also, computers could be the topic of an entire class or a component of an administration or research class. Using computers in the classroom where students are either exposed or receive hands-on experience requires additional expertise by an educator and institutional resources. Expertise and resources should be viewed as an investment in students' careers as computer skills are becoming viewed as essential professional skills.

The intent of this paper is to showcase a computer infusion project implemented in a large undergraduate recreation program and to report the results of an accompanying evaluation study of the project's effectiveness in training undergraduates in a series of computer knowledge and skill areas. Recreation programs in universities and colleges may be faced with choices on how to approach computer education. This study evaluates the effectiveness of integrating computers in several courses.

Supportive Literature

Microcomputer applications have revolutionized the recreation and tourism profession over the past ten years. New hardware and software products and services are continuously emerging that require consideration by professionals and educators. Virtually every recreation and tourism organization, business, or agency utilizes computer application software in some way (Crouch, 1991). Functions such as word processing, budgeting, programming, reservations, geographical informational systems, and database management (Bitner & Bitner, 1991; Chatfield, Deans, & Freshwater, 1990; Crossley & Jamieson, 1993; Mihalik, 1989) are considered essential to any agency's daily operations and ongoing existence. Today's professional environment requires entry level recreation professionals to be computer literate in order to compete and succeed in both the current and especially tomorrow's employment arena. The National Recreation and Park Association and the American Association for Leisure & Recreation recognized this need by changing accreditation requirements to require a computer proficiency component in undergraduate recreation programs (National Recreation and Park Association, 1995).

The importance of information management and computer literacy in the profession and the competition for jobs by undergraduate recreation students address the need for undergraduate recreation programs to provide computer based instruction and training. Recent articles in recreation publications discuss this need for higher education to take an active role in computer training (Blumenthal & Charboneau, 1990; Buergermeister & Van Loenen, 1992; Ellis & Ruddell, 1992; Francis, 1993; Williams, 1994). Certainly courses such as finance, marketing, statistics, and data management which may have formerly used "hand calculations" can expose students to automated processing (Ellis & Ruddell, 1992). Guidelines for developing computer training are present in professional journals such as *Parks and Recreation* (Williams, 1994), yet the application of computer training will vary somewhat across universities and departments depending on resources and faculty interests.

History of Computer Training at the University Studied

The previous approach taken by the university where the present study occurred was to mainstream students into one general computer course in their first year (offered by Computer Science and Engineering) or their third year (offered by Education Media). These courses are an attempt to provide an overview of systems and software applications by using lecture and a self-paced module instruction format. Computer instruction for recreation students could also occur in other courses if a teacher decided to add computer exposure or training.

The effect of the university's form of computer instruction appeared to be minimal. In a survey done for the 1992-93 academic year, 100 percent of the graduating recreation seniors rated computer skills as being "critical" to an undergraduate experience, however, less than fifty percent of them agreed that the university provided much or substantial help in learning computer skills. These '92-'93 ratings were "up" from the previous year; that is, computer skills were rated as more critical and the perception was the university was helping less. Also in 1993, another survey of recreation students found 50 percent of the students felt computer training was "critically important", whereas students rated the department as "somewhat helpful" on assistance with computer knowledge. Finally, an internship supervisor survey completed in 1993 in the recreation department revealed that employers preferred new hires to have computer skills (8% of employers rated as first choice in skills), preceded only by interpersonal skills (30% rated first choice in skills) and a willingness to learn (20% rated first choice). Furthermore, results also showed students entering internships were perceived by employers as competent in general computing, research, and data collection skills, and only satisfactory in statistical analyses.

Besides the evolving information environment in our society, evidence at the university and within the department strongly suggested that a computer education project was needed to improve computer skill levels of undergraduates. Thus, a computer education project was "born" as an effort to enhance computer instruction in an undergraduate recreation program.

Designing the Computer Infusion Project

The first step behind the computer infusion project was to create objectives and envision what a computer-based curriculum might include. This step was embedded in a grant proposal sent to the dean of the college where the recreation program is housed. The grant request outlined project objectives, a timeline, and desired outcomes, in addition to a request for money to fund a graduate assistantship and purchase needed software. In a competitive college-wide grant application, the grant was funded.

Following the grant proposal, strategies were developed for each objective. Primary objectives for the project were to (a) enhance the recreation undergraduate curriculum by adding computer skill modules to selected courses, and (b) for students to become computer proficient in several computer skill areas. Toward that end, strategies were developed including to: (a) identify the types of computer skills students needed to be effective in

professional positions or graduate studies, (b) generate an inventory of available software pertinent to the recreation field, (c) identify logical courses where computer training fits the faculty member's interests and expertise, (d) introduce software applications in designated courses with the assistance of a trained graduate assistant, and (e) evaluate computer competency levels before and after in-class computer training.

The second step in the project was to implement these strategies. The first three strategies involved identifying types and levels of computer skills. First, internship reports written by students and their supervisors were reviewed to uncover either shortcomings in computer proficiency or comments regarding the application of computer knowledge during internships. Open-ended comments were compiled and tabulated. Second, site visits were conducted with selected agencies and businesses to identify needed skill levels. A standardized questionnaire was used in the interview, as well as many open-ended notes were taken. Third, a review of computer resources at the university was completed to identify hardware and software available for classroom use. Visual site inspections were performed, as well as written materials available to students and faculty about computer resources were reviewed. A fourth step to reviewing necessary skills was to interview some students about their past experiences with computers in classes and on campus. Finally, faculty members were interviewed on their own use of computers and software applications, comfort level of teaching computer applications in their courses, and interest in teaching computer applications in recreation courses.

Outcomes of Investigative Design Work

The results of the inquiry into computer skills needed by recreation students revealed some strong directions for the full curriculum design. The review of internship files, with files being completed by every recreation student prior to graduation, indicated computer skills were needed. Based on 111 files which covered a complete calendar year (1993), 60 percent of the internships required computer skills. Tourism internships required the highest level of computer knowledge (85% of the tourism internships), followed by 71 percent of the not-for-profit internships, 67 percent of the military recreation internships, 58 percent of the outdoor recreation internships, 39 percent of the community recreation internships, and 10 percent of the therapeutic recreation internships. Students recorded working on IBM and Macintosh systems. The most common software application used was WordPerfect, followed by Lotus 1-2-3, Microsoft Word, and Geographical Information Systems, with many single mentions of various drawing and graphics packages. In addition to these software packages, tourism students indicated using computerized reservations such as WorldSpan, Apollo, PARS, and SABRE.

From these internship files, we also identified six agencies or companies in the urban area where the university is located that could further assist us in developing a computer-based curriculum. These organizations included a YMCA, a resort, two cities parks departments, the State Parks agency, and a therapeutic rehabilitation hospital. Visits were made to each agency to solicit support in the way of guest speakers and input on important skills desired from potential undergraduate hires. Skills the employers would like to see in

future employees were word processing for memos, letters, and reports; spreadsheets for analysis and budgeting; graphics for brochure and newsletter layout; and statistics for simple analysis and data reporting. Specialized software programs for recreation programming or airline reservations were noted as being important for students to know by some of the organizations; however, they commented more specialized skills can be taught on the job.

Faculty members from the recreation department felt communication, word processing, and spreadsheet skills were most important for undergraduates to learn. Graphing, statistical analyses, and specialized programs were supported somewhat less in designing a computer-infused curriculum, according to faculty. While almost all faculty members used computers in their own work, not everyone was interested in teaching or using computers in a classroom setting possibly because they did not feel they had the skills to train others. The audit of the university's computer facilities revealed that software packages were available to all students in public computer laboratories and could be accessed in classrooms from the campus-wide network. Any specialized recreation or travel reservation systems would need to be purchased for network installation.

After computer skills of some students and faculty were assessed and preferred skills of selected employers were determined, a list of corresponding software was compiled. One disparity was between the strong emphasis faculty would place on computer communication skills in comparison to practitioners. E-mail originated in university settings and it may be that practitioners were not fully networked for communication transfer. To assist with this effort of identifying software, recent issues of Parks and Recreation magazine published by the National Recreation and Park Association were used. A final step in the design process was to consider recreation courses as computer infusion targets based on several criteria: (a) interest and ability of faculty to teach computer applications, (b) level of fit between computer skill and course content, and (c) nature of the course as either mandatory or optional for recreation majors. Table 1 outlines the fall semester courses selected for computer training infusion. Seven classes were targeted for computer infusion treatment - four core courses every recreation student must take and three optional recreation courses. Specifically, the following courses were targeted: (a) the only freshman course, or "Leisure and Quality of Life", (b) the only sophomore course, or "Leisure Delivery Systems", (c) several three-hundred or junior level courses, and (d) two senior level courses.

Program Evaluation and Survey Instrument

A quasi-experimental design was used to evaluate the computer infusion project (Campbell & Stanley, 1963). The evaluation could not use a classic experimental design because students could not be randomly assigned to courses. Treatment and control groups were formed using intact recreation classes, and pre- and post-tests were employed. Seven courses were "infused" with computer instruction and skill building, thus serving as the treatment group. Three courses within the Recreation curriculum were selected as the control group . Two courses, Programming of Recreation Services and Foundations of Therapeutic Recreation, were core courses which all recreation students must complete. The third class

represented a specialty course required of only tourism majors, whom represent 50 percent of the total recreation students.

TABLE 1
First Semester's Curriculum Plan for Computer Infusion

Course Title **Treatment Courses:**	Computer Application Skill
Leisure and Quality of Life[a]	Communications - E-mail
Leisure Delivery Systems[a]	Word Processing - Word Perfect Windows & Microsoft Word Macintosh
Introduction to Tourism	Communications - E-mail
Fund-raising	Communications - E-mail
Promoting and Marketing Recreation[a]	Desktop Publishing - Pagemaker Macintosh
Leadership Institute	Communications - E-mail
Management of Recreation Services[a]	Spreadsheets/Graphing - Lotus 123 Windows
Control Courses:	
Programming of Recreation Services[a]	None
Foundations of Therapeutic Recreation	None
International Tourism	None

Note. = Core courses - all undergraduate recreation students must take.

Students in all classes under study were not told about the experimental nature of the study, but instead that the faculty was interested in computer skill levels and background information. An adjustment that needed to be made to the subject groups, because of the nature of students enrolling in multiple courses, was to check whether students were in both a treatment and control course. Subsequently, forty-seven students were eliminated from the control group dataset because they were exposed to computer training, yet they remained a subject in the treatment group dataset as their membership in the control group class would not influence their responses in this study.

Pre- and posttests were based on a review of practitioner-based literature (i.e., Parks and Recreation) to identify software packages and a review of scholarly journals to adopt an attitude scale intending to measure computer training (Francis, 1993). A four-page survey instrument was designed to evaluate the students' perceived importance of and self-rated performance on various computer packages or skills, and the students' attitudes toward computers. The instrument also included a set of demographic items and questions to understand previous and current experiences in working with computers (e.g., did they have a computer at home?, use computers at work?). Two forms of the survey were developed; one form for use at the beginning of a semester before computer instruction and training had started; and the second form for use at the end of the semester. The surveys were designed so that they could be used in courses that received computer infusion, as well as courses that would stay intact.

Pretest data were analyzed to validate that the two groups were initially comparable (Fitz-Gibbon & Morris, 1983). Two-tailed independent sample t-tests, at a 95 percent confidence level, were used to check that the groups were not significantly different on variables of interest at the beginning of the semester and at the end of the semester for those cases where both a pre- and post-test were completed (i.e., matched cases). Specifically, Levene's Test for Equality of Variances was reviewed for each performance, importance, and attitude item (Norusis, 1993, p. 255). Out of 29 items for the matched cases, four measures were significantly different including: one performance measure (Word Processing, $F=4.03$, $p < .05$), one importance measure (Word Processing, $F=4.73$, $p < .05$), and two attitude scales (Enjoy working with computers, $F=4.58$, $p <. 05$; Computers save an organization time and money, $F=5.21$, $p < .05$). It was concluded that there were no systematic differences between the treatment and control groups on matched cases that could substantially influence the final post-test results (Fitz-Gibbon & Morris, 1983, p. 88).

Two-tailed paired sample t-tests at a 95 percent confidence level were used to determine significant differences between pre- and post-test scores for each group (i.e., treatment, control). Results were based on those cases where a student completed a survey at the beginning and end of the semester. All efforts were taken to ensure sufficient group sizes, however, removing students in treatment classes from the control group data set, attrition, and unmatched surveys between pre- and post-testing caused group sizes to be reduced. Even with the control group comprised of 24 cases, this size is large enough for statistical power (Lipsey, 1990). All statistics were performed in SPSS for Windows (Norusis, 1993).

Results of Evaluation Study

Approximately 60 percent of all the current recreation majors were reached in the first semester of the project (fall, 1994) with computer training. Thirty-four percent of the students (n=77) in the treatment group participated in more than one computer infused course. Some descriptive characteristics on these participating students (n=225), as well as those students who were in control group classrooms (n=66), are presented in Table 2. Tourism students were the largest segment of the participating recreation students, followed by therapeutic recreation, youth agency, community, and outdoor. Over half of the students had computers at home with PCs being the most popular type. Two-thirds of the students were employed, on average 20 hours, while attending school. Of those students who worked, over sixty percent used a computer in their job. Sixteen percent of the subjects rated themselves as having no computer experience.

Before any training occurred, a four-page pretest survey was administered to students to provide baseline data. The results of the pretest are shown in Table 3. Students were asked to rate their performance levels on operating systems and software, in addition to their perceived importance of various computer systems and software applications. Performance levels were highest for word processing (3.1 score for treatment group, 3.3 score for control group on a 4.0 scale) while e-mail and desktop publishing ranked the lowest on performance scores. Students in both the treatment and control groups rated

importance levels of all systems and software at extremely important levels. In general, control group scores were higher on performance and importance scales, although based on Levene's test of equality of variance the groups were not significantly different.

TABLE 2
Description of Students Participating in Computer Infusion Project and Control Group (n=291)

Academic Backgrounds	Percent of Participants
Area of Concentration	
Tourism/Commerical Recreation	38%
Therapeutic Recreation	13
Youth Agency/ Not-for-Profit	11
Community/Urban Recreation	7
Outdoor Recreation	6
Major Outside Recreation	16
Undecided Recreation	9
Computer at Home	
Yes	52%
No	48
Employed While Attending School	
Yes	67%
No	33
Hours Employed per Week	20 hours (median)
Computer Use at Work	
Yes	63%
No	37
Gender	
Female	65%
Male	35
Age	18 to 56 yrs. old 22 yrs old (median)

Posttest results were significantly improved for the treatment group. Almost no significant change in scores for the control group were found. Those individuals who were exposed to computer training rated their performance on operating systems and software applications significantly higher at the end of the semester compared to the beginning of the semester. The control group did have significant performance improvement on the Windows operating system, however, this finding may be an artifact of Windows growing popularity and a natural learning effect.

On the importance of software applications at the posttest, recreation students found software applications and operating systems to be "extremely" important for their professional development, as indicated by the mean scores ranging from 2.3 to 2.9 on a 3-point scale where "3" represented extremely important. Students in the treatment group showed heightened importance ratings in posttest scores on some software applications. For example, strong importance ratings were recorded for the Windows operating system, spreadsheets and databases, and desktop publishing. Students in the control group decreased their importance rating on only one software application - communications/e-mail.

TABLE 3
Computer Self-rated Performance and Importance Scales
Pretest and Posttest Means for Treatment and Control Groups

	Treatment Scores (n=161)			Control Scores (n=24)		
Items	Pretest	Post-test	p-level[c]	Pretest	Post-test	p-level[c]
Self-rated Performance[a]						
Macintosh Operating System	2.3	2.6	.003**	2.6	2.7	.605
Windows Operating System	2.5	3.0	.00***	2.6	3.1	.008**
Word Processing	3.1	3.3	.00***	3.3	3.4	.328
Spreadsheets/Databases	2.1	2.3	.003**	2.5	2.4	.789
Communications/E-Mail	1.7	2.6	.00***	2.0	2.2	.462
Desktop Publishing	1.7	2.0	.00***	2.0	1.9	.358
Importance Rating[b]						
Macintosh Operating System	2.4	2.5	.235	2.4	2.4	1.00
Windows Operating System	2.6	2.8	.00***	2.7	2.8	.716
Word Processing	2.8	2.9	.05	2.9	2.9	.665
Spreadsheets/Databases	2.4	2.6	.004**	2.6	2.6	1.00
Communications/E-Mail	2.6	2.7	.158	2.7	2.5	.021*
Desktop Publishing	2.3	2.5	.003**	2.7	2.5	.270

Note. a = Performance Scale was a four-point with a range of "1 as no proficiency" to "4 as high proficiency." b = Importance Scale was a three-point with a range of "1 as not important" to "3 as extremely important." c= Two-tailed paired sample t-test at a 95% confidence level was for calculations. * Significant at p<.05 level. ** Significant at p<.01 level. *** Significant at p<.001 level.

Results of the attitude scales are presented in Table 4. Students in computer infused classes once again showed a significant improvement in their attitudes towards computers. On the first seven attitude items, which were worded in a positive manner, the change in

treatment scores from pretest to posttest were significantly higher than changes in control group scores. Improvement was found in students' rating of "enjoy working with computers," "computers should be used in the classroom," "believe my knowledge of computers is adequate," and "feel computer skills have contributed to being a better student." When students were asked if they found computers to be "complex and confusing" or whether computers made them nervous, subjects did not change their attitudes. Students in both groups did significantly change on their perceived patience when working with computers. Students in the control group, particularly, rated their patience levels as improving ($p < .01$). The final seven attitude items were worded in a negative way and the scores have been reverse coded. No significant changes in means were noted for the control group, and two significant changes were recorded for the treatment group. Specifically, students in computer labs were moving toward a neutral position from not being interested in learning about the latest computer technology, and moving toward a disagree position that computers are getting too much hype. Possibly these results indicate that after sessions in a computer lab, students recognized the difficulty of learning the basics and the real need for computer skills, however, they also realized learning about latest technologies may almost be impossible to achieve.

TABLE 4

Attitude Scales Pretest and Posttest Means for Treatment and Control Groups

	Treatment Scores (n=161)			Control Scores (n=24)		
Attitude Scales[a]	Pretest	Post-test	p-level[b]	Pretest	Post-test	p-level[b]
Enjoy working with computers.	3.7[b]	3.9	.004**	3.9	4.0	.704
Computer should be used in the classroom.	3.8	4.0	.001**	3.8	4.1	.148
Computers knowledge is necessary in today's job market.	4.5	4.6	.282	4.5	4.8	.135
Believe my knowledge of computers is adequate.	2.7	3.0	.002**	2.7	2.8	.417
Important to know how to use a computer to get a good job.	4.2	4.2	.863	4.3	4.1	.328
Computers can save an organization time and money.	4.4	4.4	.494	4.2	4.3	.575
Feel my computer skills have contributed to being a better student.	3.6	3.9	.011*	3.6	3.8	.477
Find computers confusing to be complex and confusing.	2.8	2.7	.105	2.9	2.4	.053
Find computer make me a bit nervous.	2.7	2.6	.050	3.0	2.4	.050

Tend to have little patience when working with computers.	2.6	2.5	.042*	2.8	2.2	.007**
Computers are getting too much hype[c]	4.2	4.4	.013*	4.1	4.0	.707
Hate working with computers.	4.2	4.3	.235	4.3	4.3	1.00
Not interested in learning about latest computer technology.	4.4	4.2	.041*	3.9	3.9	1.00
Don't understand why computers are so important.	4.5	4.4	.198	4.2	4.2	1.00
Don't feel comfortable using computer	4.0	4.1	3.95	4.1	3.9	.616
Don't like learning new computer applications	4.1	4.2	.245	3.6	4.0	.110
Don't need computer skills to work in leisure profession.	4.0	4.2	.132	3.9	4.4	.055

Note. a= Scale was a five-point with a range of "1 as strongly disagree" to "5 as strongly agree." b= Two-tailed paired sample t-test at a 95% confidence level was used for calculations. c= Items in this section were reverse-coded. * Significant at p<.05 level. **Significant at p<.01 level. *** Significant at p<.001 level.

Value to Educators and the Profession

The undergraduate computer infusion project seeks to give students the necessary skills and tools to be more effective recreation professionals. In the process, we are implementing goals established by our university to be "high tech" with instruction and on the "leading edge" in undergraduate education. Furthermore, our teaching delivery approach is to evaluate progress at every stage so that we can quantify and explain results, thus monitoring educational outcomes.

The first semester of computer training appeared to be successful. Students enrolled in recreation courses with computer training clearly had greater improvements in perceived performance levels, importance ratings, and attitudes towards computers and applications. Results of this evaluation study suggest recreation programs can achieve improved computer skill building by integrating computer instruction and training into their own curricula.

Many difficulties were encountered with the infusion project. First, scheduling computer classes was quite difficult at the university where this study was conducted. Classes which use a computer lab all semester long were given priority and special events or one-time reservations were very difficult to arrange. Second, computer labs are small in size and class sizes are large, therefore students were sometimes required to share a computer. Third, hardware and software problems such as the network being down sometimes hindered the faculty members' ability to deliver a quality experience. Finally, students were very demanding in a computer lab setting. The range of skill and patience by students made the computer lab setting not an attractive teaching experience for all faculty members.

Limitations of the program evaluation include testing, contamination, natural maturity, and statistical power. A pretest at the start of the semester may have conditioned students to pay closer attention to computer elements of a course and subsequently score themselves as improving at the end of the semester. To reduce any possible testing effects, the results of the pretest were not discussed during the semester. Contamination or sharing course experiences with recreation students who were in the control group and exposure to computer instruction obtained in nonrecreation courses (e.g., math, business) or on a job was probably present. Natural maturation probably occurred. Being in a society where computers are becoming increasingly important, as well as the personal and professional growth seen in students who pass from freshman and sophomore status to upper division will more than likely cause changes. Finally, true differences in the control group may not have been detected as sample size met minimal requirements (Norusis, 1993, p. 256). A larger control group could have been found if we looked to classes outside the recreation curriculum, however, then we would have reduced validity.

In a given semester a recreation department may not offer all the classes in their program. Thus far this paper has featured the courses offered in one semester. In the design of our overall computer project, we considered all the courses that are offered in the curriculum. Figure 1 illustrates a building block and reinforcement approach to computer training that extends beyond the treatment tested in this paper. Williams' (1994) computer modules were closely followed to arrive at content and flow. In lower division level courses, electronic communication (i.e., e-mail, networking) and word processing training is recommended. Three-hundred level recreation courses should offer analytical training with spreadsheets and graphing, as well as desktop publishing in a marketing or programming course. Communication and word processing should also be reinforced in upper-division level courses. In the final year of course work when students enroll in management and research courses, all the previous skills should be integrated into course materials. Additionally, complex analysis should be taught using spreadsheet applications such as Excel or Lotus 1-2-3 and statistical packages such as SPSS or SYSTAT.

A critical decision to any computer infusion effort is how much computer training. The level of infusion or dose of treatment will effect the desired outcome (Yeaton & Sechrest, 1981). In our study, we created a dose of several computer lab class times with assignments in all the classes, except for the Fundraising and Leadership Institute courses where e-mail was used on a weekly basis. We could have created a semester long course on computer applications in parks and recreation, however, we are already under pressure to reduce the credit hours needed to graduate students. Possibly a stronger dose of computer training in the selected courses could have produced higher performance levels, greater importance ratings, and more positive attitudes. For instance, students' attitudes were unchanged in the treatment group regarding "computer knowledge is necessary in today's job market," "it is important to know how to use a computer to get a good job,", and "no need for computer skills to work in leisure profession." These results suggest our computer infusion program might benefit from a greater emphases on professional orientation (i.e., guest speakers).

Lower Division Recreation Courses
Building Electronic Communication and Word Processing Skills

3rd Year - Upper Division Recreation Courses
Building Analytical and Desktop Publishing Skills
Reinforcing Electronic Communication and Word Processing Skills

4th Year - Upper Division Recreation Courses
Building Statistical Skills
Reinforcing All Previous Skills

Figure 1. Computer Infusion Curriculum Model for Undergraduate Recreation Programs

Future Research

Recommendations for future research include: (a) creating skill diagnostic tests to measure actual performance levels for word processing, spreadsheet calculations, graphing and presentations, and statistics, (b) adjusting doses of computer training to determine the amount of training that is needed to cause desired performance and attitude levels, (c) investigating factors which contribute to or act as barriers to successful computer learning and applications, (d) continuing to monitor alumni surveys conducted at the university and college level, as well as evaluating computer training received in recreation courses after a student has began a professional position, and (e) continuing evaluation on the effects of computer training by employing pretests and posttests across treatment and control groups, hence performing longitudinal analyses across semesters.

As universities and departments turn to performance-based evaluation to measure educating and servicing students, providing computer instruction in a programmatic format has the potential for showcasing some exciting educational advancements. The results of this program evaluation not only show students believe computer instruction is important, but also instruction can lead to improved attitudes toward computers and perceived proficiency in using them.

Students should expect professionally-based undergraduate programs, in contrast to liberal arts education, to provide them with the necessary training to perform a job effectively. According to the review we made of recreation professionals associated with our undergraduate program, they are expecting recreation students to be computer proficient. Thus, it is time for recreation curricula to respond.

References

Bitner, D. & M.V. Bitner (1991). Automating P&R operations. *Parks and Recreation, 26*(6), 40-42.

Blumenthal, K.J. & B. G. Charboneau (1990). NRPA moves into information age. *Parks and Recreation, 25*(6), 30-36.

Buergermeister, J. & D. Van Loenen (1992). Computer skills are essential for the hospitality manager, educator, and student. *Hospitality & Tourism Educator, 4*(2), 48-51.

Campbell, D.T. & J.C. Stanley (1963). Experimental and quasi-experimental designs for research on teaching. In N.L. Gage (Ed.), *Handbook of Research on Teaching* (pp. 171-246). Chicago, IL: Rand McNally.

Chatfield, D., C.B. Deans, & D.B. Freshwater (1990). Computerizing parks and recreation. *Parks and Recreation, 25*(6), 54-59.

Crossley, J.C. & L.M. Jamieson (1993). *Introduction to commercial and entrepreneurial recreation* (Second Edition). Champaign, IL: Sagamore Publishing.

Crouch, G. (1991). Expert computer systems in tourism: Emerging possibilities. *Journal of Travel Research, 29*(3), 3-10.

Ellis, G.D. & E. J. Ruddell (1992). Using personal computers for teaching and research recreation and leisure studies. *Trends, 29*(3), 4-12.

Fitz-Gibbon, C.T. & L. Morris (1983). *How to design a program evaluation.* Newbury Park, CA: Sage Publications.

Francis, L.J. (1993). Measuring attitude toward computers among undergraduate college students: The affective domain. *Computer Education, 20*(3), 251-255. IL: SPSS, Inc.

Lipsey, M.W. (1990). *Design sensitivity: Statistical power for experimental research.* Newbury Park, CA: Sage Publications.

Mihalik, B. J. (1989). A strategy for adopting microcomputer technology into leisure studies curricula. *SCHOLE: A Journal of Leisure Studies and Recreation Education, 4,* 105-118.

National Recreation and Park Association (1995). *Standards and evaluative criteria for baccalaureate programs in recreation, park resources, and leisure services.* Arlington, VA: National Recreation and Park Association.

Norusis, M.J. (1993). *SPSS for Windows base system user's guide - release 6.0.* Chicago, IL: SPSS, Inc.

Reswick, J.B. (1994). The source of information power. *Parks and Recreation, 29*(6), 38-42.

Williams, A.E. (1994). Computer literacy in accreditation: Putting students in the driver's seat. *Parks and Recreation, 29*(6), 54-57.

Yeaton, W.H. & L. Sechrest (1981). Critical dimensions in the choice and maintenance of successful treatments: Strength, integrity, and effectiveness. *Journal of Consulting and Clinical Psychology, 49*(2), 156-167.