CLEMSON UNIVERSITY

**SUMMARY REPORT
ON
INSTITUTIONAL EFFECTIVENESS**

**SUBMITTED TO
COMMISSION ON HIGHER EDUCATION**

AUGUST 2001

This Summary Report on Institutional Effectiveness, 2001, for *Clemson University* includes: Majors or Concentrations and Library Resources.

Pursuant to the information from the SC Commission on Higher Education, the reporting schedule has been modified. The following reporting cycle displays the components reported in the past as well as planned cycle. From 2001 and forward, Library Resources, General Education, Student Development, and Academic Advising will be reported in 4-year cycles as shown below as stated by the CHE staff.

Component	1999	2000	Revised 2001	2002	2003	2004	2005
1. General Education	X			X			
2. Majors or Concentrations	X	X	X	X	X	X	X
3. Performance of Professional Programs	X	X	X	X	X	X	X
5. Academic Advising	X	X	X			X	
12. Procedures for Student Development		X			X		
13. Library Resources and Services	X		X				X
Performance of Transfer Students from Technical Colleges		X		X		X	
Self-Reporting Alumni Placement			X		X		X

Component 2
Majors or Concentrations

Reporting on assessment in the major has been modified across the state to coincide with program reviews. Majors in the areas of engineering and industrial technology underwent program review by the South Carolina Commission on Higher Education (CHE) and Accreditation Board for Engineering and Technology, Inc. (ABET) http://www.abet.org/ since the last reporting period. Those programs included in the Interim Report are landscape architecture and architecture.

Synopsis of Program Review: Assessment for Selected Majors or Concentrations

Engineering and Industrial Technology The College of Engineering and Science is the only college at Clemson University having its own assessment committee. The assessment committee met throughout the self-study period and was formally incorporated into the structure of the college in 2000. The Clemson University programs reviewed by the South Carolina Commission on Higher Education this past year included: Civil Engineering, Ceramic Engineering, BioSystems Engineering, Computer Science, Chemical Engineering, Electrical Engineering, Mechanical Engineering, Industrial Engineering, and Computer Engineering. These programs are highlighted in this program review synopsis.

Civil Engineering (http://www.ce.clemson.edu/Default.htm)
Today, the Department of Civil Engineering offers undergraduate course work in all major fields of civil engineering. The department offers graduate degree programs leading to the Master of Science, Master of Engineering and Doctor of Philosophy degrees with specialization in Applied Fluid Mechanics, Construction Materials, Construction Project Management, Transportation, Structural, and Geotechnical Engineering. Current enrollments are about 237 undergraduate and 55 graduate students. The Department of Civil Engineering has responded to changes in leadership including a new dean (1994), reorganization of the university and college (1996), and new department chair (1998).
From 1993 until the completion of the Self-Study in August 2001, the Civil Engineering B. S. curriculum has undergone modifications. The modifications were driven by external constraints, input from program constituents and faculty initiatives. To ensure meeting the mandates of the Accreditation Board for Engineering and Technology (ABET), Engineering Accreditation Commission, additional specific curriculum changes were implemented in 1998. The 1998-99 curriculum was unanimously approved by the Civil Engineering faculty and was reviewed and supported by the Civil Engineering Advisory Board. The Self-Study reports 3 distinct assessment cycles. The most recent cycle (1998-99) provides strong insight into the performance of students in technical areas but less information on skills and knowledge in communication or societal impact of engineering solutions. Continued collection and triangulation of data will provide better information for decision making regarding the curriculum. However, many changes have been implemented based on evaluation of both quantitative and qualitative data. Existing courses were replaced with stronger, broader courses and sequencing of courses was changed. New courses in the Civil Engineering department were developed to integrate civil engineering applications into structural and fluid mechanics and to improve creative problems solving. Other courses were eliminated based on the college mandate to reduce credit hours and increase flexibility.

The Masters of Engineering, a practice oriented degree, and the Master of Science are reported to be solid programs that adequately prepare students for employment in their chosen fields. Graduates of both programs obtain jobs immediately after graduation. Although the programs are not large, there is an adequate number of students to enable consistent graduate level course offerings and to maintain the degrees. Opportunity exists for all interested students to participate in graduate research. Efforts are being made to increase the number of students in these degree programs. The number of students enrolled in the Ph. D. program provides discrimination of the applicants to maintain a high quality doctoral program. Approximately 65% of the doctoral students are on assistantships. In 1999, 14 of the 15 enrolled students were working on funded research with faculty. Assessment of the doctoral program is not just of the quality and progress of the students but also of the curriculum. Survey items examine the graduates' preparation for lifelong learning, generation of new knowledge and engineering methods.

Ceramic Engineering (http://mse.clemson.edu/cme/index.html)

The Ceramic Engineering baccalaureate program integrates laboratory and industrial processing experiences with classroom instruction to better prepare students for future professional practice and life-long learning. To accomplish this, ceramics and materials courses encompass processing, characterization, properties of ceramic materials, and advanced scientific principles. Modifications to courses have been made to address suggestions from an earlier ABET review team. In 1997, Engineering Economic Analysis was added courses have been revised to emphasize optical and magnetic properties, and laboratory experiences have been enhanced. A departmental strategic and tactical plan was completed during Spring 1999. It shall be implemented immediately upon approval by the Dean's office. Other changes include renovation of class rooms, development of graduate research activities central area, and general maintenance and repair work to Olin Hall.

Graduate Ceramic and Materials Engineering program is open to students with baccalaureate degrees in any branch of engineering and to those with degrees in chemistry or physics that have credit for certain prescribed courses in engineering. Students may direct their programs toward traditional fields of CME or toward multidisciplinary fields such as biomedical or materials engineering. Courses in engineering, chemistry, physics and mathematics provide adequate background for learning the behavior of materials. CME study includes research into selected material topics in ceramics, metals or polymers, with the preparation of a thesis as a major part of the program. The M.S. or dissertation degree program requires a minimum of 30 hours of graduate credit, including six hours of thesis research. The assessment of the graduate programs is accomplished by using several strategies. These include the industrial advisory board, alumni survey, and focus groups of currently enrolled students. The assessment records report data and evaluation of the results for four master's level educational outcomes. These are "The CME graduates will be able to 1. function easily and well in ceramic and materials laboratories and plants and will be prepared to assume leadership roles in these environments. 2. demonstrate understandings of the application of scientific, mathematics, and engineering principles to practical ceramic and materials engineering problems and will be prepared to provide leadership in these areas. 3. design and conduct ceramic and materials experiments utilizing appropriate experimental design methodologies and will be prepared to provide leadership in such efforts. 4. function well within the local, national, and international ceramics and materials community." The doctoral level educational outcomes are more demanding of scholarship and practice; however, the strategies to examine these outcomes are similar.

Biosystems Engineering (http://www.clemson.edu/agbioeng/pages/degrees/biosys.htm)

The undergraduate curriculum of Biosystems Engineering is comprised of the three concentration areas built around a common core of 110 semester hours including 10 hours of free electives. Core courses include physical sciences and design, communication skills, humanities and social sciences, and biological sciences. Additional engineering and biological sciences courses are appropriately included in the concentration area. All Clemson engineering freshmen have a common curriculum.

The undergraduate curriculum includes courses such as mechanics, fluids, thermodynamics, electrical theory, computing devices and systems analysis. Courses in the basic sciences appropriate to the concentration areas provide a foundation for engineering design and development and for the management of biological systems. In addition, important facets of energy conversion, research methods, use of economy and integrity in design and protection, modification, and control of the environment are included.

The 1993 ABET accreditation review of the department's undergraduate engineering curriculum contained several observations, concerns and deficiencies. Modifications have been made to address these areas. For example, the number of emphasis areas has changed from four to three. In recognition of student interests and the changed direction of the program of, the program name was changed to biosystems engineering in 1997. Additionally, engineering design has been added in several courses. The capstone design course was developed and features industry generated problems and a project team emphasis that involves open ended design problems. The number of credit house was reduced from 143 to 135. All of the engineering majors on campus took similar action in response to administration, student, and parent requests to reduce the house so that more students could graduate in four years.

Graduates in Biosystems Engineering are well equipped to use their expertise in engineering in many areas that affect our quality of life and environment. They have broad training in mathematics, physics, chemistry and biological sciences, as well as a sound background in the engineering sciences. Biosystems engineers are sought by industry and public service organizations primarily for their ability to apply engineering expertise to living systems and to the management of land and water resources. Biosystems engineering graduates work in the areas of design, research, production and sales with industry, teaching, research, Extension Service and field engineering with governmental agencies. Biosystems engineers may be consulting engineers or as owners of businesses that provide engineering services and related products.

The Biosystems Engineering graduate programs are designed to prepare graduates for leadership, creative accomplishment and continued professional learning, and to prepare graduates to effectively conduct independent scientific research. Students may be accepted with backgrounds in quantitative-based scientific fields relating to chemistry, mathematics, physics, biology or any branch of engineering. A number of undergraduate prerequisite or co-requisite courses may be required for applicants who have undergraduate degrees in non-engineering disciplines. Each degree program is planned individually to augment the student's previous engineering and science background with adequate breadth in engineering and specialization in an area of biosystems engineering. In addition to biosystems engineering, course work includes mathematics, physics, chemistry, statistics, and biological and engineering sciences. The annual assessment records show that all of the MS and Ph.D. students presented or published a paper in the 1996-1999 period, and were active in relevant professional societies. All of the students reported that they were either employed or continuing their education within 3 months after graduation. Candidates for graduate demonstrated an ability to apply fundamental knowledge of bioengineering to questions of engineering science and technology.

Computer Science (http://www.cs.clemson.edu/html/academics.shtml)

Over 600 students make up the current undergraduate program of Computer Science. The department offers three different undergraduate degrees. (1) B.S. in Computer Science. Technically oriented degree for students interested in software development for basic computer science, scientific and engineering applications. The degree is accredited by the national Computer Science Accreditation Board (CSAB). The major also includes an emphasis area selected from another area. (2) B.S. Computer Information Systems. Appropriate for students interested in applying computing to business applications. (3) B.A. in Computer Science. A liberal arts degree that provides the student with the maximum flexibility in designing a program that supports his or her particular interests while at the same time providing a firm foundation in computer science.

Modifications to the alumni survey have been made to ensure that the data being collected for the B.S. program in Computer Science represents the information that is needed. Because the criterion is satisfied in all indicators of the B.S. Computer Information Systems, changes have not been reported to the curriculum nor have changes been made in practice of advising students. The B. A. in Computer Science is a small program. With few graduates and a low response rate on the alumni surveys, the department is unable to make any decisions until a significant survey response can be developed.

In addition to the undergraduate program, there is a graduate program and a Master of Fine Art in Computing. The Masters of Fine Art in Computing is a professional degree program aimed at electronic arts, particularly special effects for entertainment and commercial video and film. It is a unique blend of instruction from art, computer science, computer engineering, graphic communications, performing arts, philosophy, and psychology, together with newly designed courses targeted at the specific production techniques. Also, Clemson offers a Master of Electronic Commerce degree program jointly administered by Computer Science and the MBA Office of the College of Business and Public Affairs. The Master of Electronic Commerce prepares students to understand current and future trends in electronic commerce and to participate in analysis, design, implementation, and operation of electronic commerce systems.

Electrical and Computer Engineering (http://ece.clemson.edu/intro.htm#ece)

The stated mission of the Electrical and Computer Engineering Department is (1) to educate and promote the intellectual development of both undergraduate and graduate students of electrical and computer engineering, (2) to promote the growth of leadership and creativity among the students and faculty, and (3) to develop and share knowledge.

The Department of Electrical and Computer Engineering has an enrollment of 360 undergraduate students, sophomores and above. There are 140 resident graduate students in two separate degree program areas: Electrical Engineering and Computer Engineering. Being one of the larger departments on campus, the ECE Department plays a major role in degree production, in sponsored research activity and in service to the community. Modifications have been made to the BS program in Computer Engineering to address identified deficiencies from the 1993-94 visit and to meet the Criteria 2000 of ABET. In 1997, an assessment of Criteria 2000 was initiated. Three complete cycles have been implemented resulting in a growing database, developing experience in assessment, and creating a foundation for responsible decision-making.

The graduate programs offer a variety of opportunities for development through research, specialized formal course work and teaching experience. The Department offers the Master of Engineering, the Master of Science, and the Doctor of Philosophy degrees in both electrical engineering and computer engineering. Currently there are 48 students in the Ph.D. program and 94 students in the

M.S. and M.E. programs. Approximately 101 of these students receive financial support in the form of fellowships, industrial grants, teaching assistantships, and research assistantships. The graduate studies and research programs include a spectrum of activity reflecting the interests and expertise of the faculty. Particularly noteworthy across the faculty are the breadth of education, the balance between experience and youth, the record of recent publications, and the research funding obtained in recent years. The 34 full-time faculty members include seven IEEE fellows, one endowed chair and six named professorships. Current focus areas of research include Communications/DSP, Computer Communications, Computer Systems Architecture, Controls/Robotics, Electronics, Electromagnetics, and Power. The assessment of the desired student outcomes continues. Like many other graduate programs, with small numbers of alumni responding to surveys, it is necessary to accumulate data over a period of time in order to use it critically in program evaluation. The Electrical Engineering program continues to monitor these.

Chemical Engineering (http://www.ces.clemson.edu/chemeng/)
　　　　Chemical Engineering is the only traditional engineering discipline that is based on all three sciences of chemistry, physics, and mathematics. Chemical engineers are involved in such things as the research, manufacture, sales, and use of commodity and specialty chemicals, petroleum products, textiles, synthetic fibers and films, pharmaceuticals, pulp and paper, electronic components, food and consumer goods, and many other products.
　　　　The assessment process implemented by the Chemical Engineering department is based on constituency input. Current students, their parents, alumni, corporations, the profession, and the citizens of the state as represented by the State Legislature via the SC Commission on Higher education are all considered during the assessment process. The program criteria are related to specific course of instruction within the department and to the Program Educational Objectives. Some of the changes that have been made are a direct result from students and alumni. For example, feedback from students and alumni pointed out to the faculty that the first semester of physical chemistry is redundant of the first chemical engineering thermodynamics course. And, that the chemical engineering thermodynamics courses can serve as an adequate prerequisite for the second physical chemistry course. Some student and alumni also expressed a desire to broaden their advance chemistry experience. After careful study, the faculty responded by making the first semester of physical chemistry one of several advanced chemistry electives from which chemical engineering majors can chooses. The second physical chemistry course and both semesters of the physical chemistry laboratory are required of all chemical engineering students. The assessment of the masters and doctoral level programs has been limited. The strategies include professional employment and research publications. The assessment records do not report program changes based on the assessment results at this time.

Mechanical Engineering (http://www.ces.clemson.edu/me/)
　　　　The mechanical engineering curriculum reviewed during the 1993-94 ABET visit was replace with a new curriculum that was implemented beginning with the Fall 1996 semester. This curriculum was initiated in response to consistency input and the assessment processes that suggested improvements in programs structure, better efficiency in course topics, and a need to reduce student time to complete the program. In the revision process, every existing course was thoroughly reviewed for content, how it is used as prerequisite material, how each course met program objectives, how course outcomes an expectations were related, how course materials would be built on by subsequent courses, and how each course met the general education and accreditation requirements. Changes included the addition of two

introductory sophomore courses and a senior year design sequence. A new laboratory sequence was conceived. The ABET visitor when reviewing the program in 1993-94 offered some observations. Acting upon the recommendation, a revision of the laboratory sequence and investment in laboratory equipment has provided continuous improvements in the instructional facilities.

The graduate programs in Mechanical Engineering are assessed annually. The findings of the MS program are deliberated by the Graduate and Research Committee when students do not achieve the Criteria for Success for the desired outcome. Examples include the percentage of students maintaining a designated GPA, the percentage of students being published in a professional journal or conference proceedings. In developing an assessment record, it is important to use more than one indicator for each outcome. Most of the indicators were met or exceeded. The assessment report for the Ph.D. program showed strong student achievement in meeting the educational outcomes. Modifications to the Ph.D. program based on the assessment activities are not being considered at this time.

Industrial Engineering (http://ie.eng.clemson.edu/default.htm)

Perhaps the most significant aspect of the Industrial Engineering Department is its concentration in the areas of quality engineering, ergonomics and system design. These themes guide teaching, service to the profession and community, and research. Enrollment of undergraduates remained stable while engineering enrollments in general were in decline, and a trend of growth in the graduate programs started. Mike Leonard returned to teaching, research and service from his leadership of the Department in fall of 1995, and Dr. D. L. Kimbler, P.E. assumed duties as Department Chair. (The campus-wide reorganization in 1995 resulted in this change of title, but Department operations continued much as before.) Department facilities were modernized to include a 20-station computer teaching laboratory and a design studio for student projects. Carl Lindenmeyer and Jim Chisman retired and moved to professor emeritus status. As the Department continues to maintain quality of instruction in the baccalaureate program, it also pursues new opportunities to broaden its scope in service, research and graduate studies. As the only Industrial Engineering program in South Carolina, it continues to fulfill its mission for the state and its role in education for the profession of industrial engineering.

Modifications have been made to the IE curriculum as a direct result of evaluating data regarding student outcomes. For example, the faculty reviewed the first-time test takers' scores of the Fundamentals of Engineering Exam topical areas. Changes included modifications to syllabi and offering a review course to the students. Capstone design course, a laboratory to IE 201, development of standard syllabi, course offerings and schedule modifications are examples of other changes that have been implemented.

The assessment activities of the graduate programs have been no less productive in providing information. The extensive analysis resulted in specific considerations as listed: 1. Expand competence in ergonomics through shift of faculty emphasis and cooperation with other Clemson programs in related areas; 2. Aggressively pursue opportunities and program development in areas enabled by new technologies or changes in ways of doing business; 3. Use research and development funds as available to expand space into off-campus facilities and convert low utilization on-campus space to productive use; 4. Develop focused centers to increase visibility of research programs; 5. Monitor development, both on campus in competing institutions, of distance learning initiatives; 6. Develop alliances with other institutions to increase the recruiting base of domestic students; 7. Seek non-institutional funds for research faculty.

Interim Report

The programs in the interim report are not required to prepare a review for the South Carolina Commission on Higher Education (CHE) or professional accrediting agencies. The information presented in this summary is taken from the annual Assessment Records.

Landscape Architecture

The contributions a landscape architect makes to a private residence, a building, a development, a park, or a city are multi-faceted and vital to its ultimate success or failure. Decisions about how to use outdoor space - where people will walk, sit, congregate with others, interact with the outside environment are made by the landscape architect. If those decisions are good ones, based on careful observation of human behavior and skillful use of the natural setting, the design that results will become a useful and integral part of the whole. The landscape architect may work alone or as a team with architects, city and regional planners, engineers and horticulturists, serving as the creative link that brings the parts of a project together. However the work is accomplished, the goal is always to improve the human condition through design on the land. The successful landscape architect is an innovative problem solver, decision-maker, people watcher and, an artist whose canvas is the outside world.

Clemson's five-year Bachelor of Landscape Architecture degree program immerses students in a cross-discipline study of landscape architecture. It provides opportunities for exposure to diverse courses that include architectural design, turfgrass management, and public speaking. The program's location in the College of Architecture gives students the important opportunity to interact with faculty and other students in the allied areas of architecture, city and regional planning, and construction science and management. Students who have exceptional records in the program may further their study of architectural history and urban design at the College's center in Charleston, South Carolina during their third or fourth years and in Genoa, Italy during their fifth year. Hands-on experience, a requirement of the program, brings enthusiasm and excitement to the study of landscape architecture and produces graduates who are ready to be employed as professionals in the field.

To ensure on-going enhancement to the current program, evaluation of the program is critical. The use of assessment results demonstrates that changes are made to improve the program. For instance at the Faculty Retreat in July 2000 informal discussions were held regarding the student course content, objectives for project statements and semester sequence of content. Discussions also focused on graphic communications including the role, types, and relationship to the design studio. Writing skills beyond those included in the general education requirements and oral presentation skills were discussed. Consideration was given to when and how they are taught and how they are assessed. Future assessment reports will incorporate modifications reflecting this faculty discussion. The program will undergo a site visit in October 2001 from both the SC CHE and the professional accreditation agency. Additional demonstrations of assessment will be available prior to the visit.

Architecture (http://www.clemson.edu/caah/architecture/)

Architecture has been taught at Clemson since the early part of the century. As Clemson evolved into a university of national prominence, so did the program in Architecture. Today, the School of Architecture is part of the College of Architecture, Arts and Humanities that includes nine other departments, and it leads the University in attracting the finest undergraduate students, as measured by class rank and SAT scores. The School has its own endowment through the Clemson Advancement

Foundation (CAF) of approximately $9 million for the support of graduate fellowships, enrichment activities and programs.

Clemson University offers the undergraduate degree of Bachelor of Art with a major in Architecture, the Master of Architecture and the research degree of Master of Science in Architecture. The School has three off-campus programs in Charleston, South Carolina; Genoa, Italy; and Barcelona, Spain.

Significant changes have been made recently in the BA program of Architecture. A revised curriculum incorporates level and scope of critical issues (awareness of social, economic, and environmental issues) by academic year. Revisions were made in 1998-1999 to also include a two-semester sequence on Construction Materials and Methods which addresses a concern raised by the National Architectural Accrediting Board. Collaborative studios emphasizing written and oral communications in the first two years have been developed. Similar modifications were made to the B. S. program in Architecture.

Adjustments to the graduate programs have likewise strengthened them. The development of an architectural firm survey instrument by 1999 will assist in the evaluation of aesthetic and technical competence of the graduates. Computer skills will be strengthened through the placement of additional computers in the graduate program studios.

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Component 5
Library Resources

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Overview
Clemson University continues to respond positively to change. Many strategies have been used in the past several months to assessment the University Libraries. Resulting from the evaluations, modifications to practice, alignment of resources, and development of new activities have been implemented that are consistent with the Clemson University Libraries Strategic Plan. The following discussion is a brief review of the types of assessment activities (Measures and Strategies) and some of the findings (Use of Results and Conclusions). It is evident from the review of activities and results that Clemson University continues to demonstrate the importance of using assessment data for decision making and thus, improving institutional effectiveness.

Measures and Strategies
1. President's Library Summit
   Several outcomes from the Summits held in the summer of 2000 have been the foundation for plans to enhance the Libraries at Clemson University. One such driver is the "Library Declaration of Independence" that charges the Library to establish two objectives. These objectives are (1) to serve our constituent groups specifically to provide access to the highest level of information for students and faculty, and (2) to create a community for meeting and collaborating to enhance research and scholarship. From this, short- and long-term strategies were identified as well as internal and external funding sources.

2. The Commission on the Future of Clemson University
   In its final report, the Library and Information Technology Committee of the Commission on the Future of Clemson University made several recommendations regarding the library. Recommendations included changes in technology, facilities, service, and personnel salaries. These recommendations are addressed in the University Libraries Assessment Report, 2001, and integrated into the objectives of the Assessment Plan.

3. University Libraries Assessment Record, 2001
   The Assessment Report for University Libraries was filed with the office for Institutional Effectiveness and Assessment spring 2001. The report completes the assessment record and includes a clear link of the library's mission to that of the University. The Outcomes stated in the plan are supported by assessment strategies and criteria for measuring the success of the achievement. The outcomes are:
1. *Provide information resources and services to our users when they need them with a heavy emphasis on providing information electronically to the user's desktop.*
2. *Identify measures of success that most clearly reflect our unique goals and mission.*
3. *Improve the facilities and use of space within Cooper Library to better serve our clientele and make Cooper Library the academic center on campus for collaboration.*
4. *Staff the Libraries appropriately for the new mission of the Libraries.*
5. *Actively seek collaborative partners and be proactive in the initiation of collaborative programs.*
6. *Increase funding from all sources to supply the funds necessary to meet the above goals.*

4. Clemson University Assessment Committee

The Libraries Subcommittee of the University Assessment Committee was given the task of investigating alternatives to the traditional methods of assessing the success of a university library. The nature of the university library has changed significantly since traditional measures such as number of volumes were developed. With the advent of electronic access to many kinds of library resources, simply counting the volumes housed on campus does not accurately reflect the quality of services provided by the library to its users. These traditional measures also may not allow assessment of the library's broader function as the center of scholarly community.

Newer approaches to assessing the quality of library services focus on access to materials, including electronic access, interlibrary loan, and response time to requests for information, rather than the size of the in-house collection. The library environment, including noise levels, food service, and the quality of user space are additional targets for assessment. Services such as instruction, photocopying, and security should also be addressed by assessment measures. Library usability, including computer access, signage, advertising of services, and facility maintenance also contribute to user satisfaction with library services.

The subcommittee used focus groups to examine user perceptions of current library services. The Clemson University Libraries provided recorders for the sessions, which were held in the second floor conference room of Cooper Library. All responses were reported anonymously. The faculty was represented by departmental library liaisons. Graduate students were invited from a randomly selected list, from student organizations, and from the Graduate Student Association. Every undergraduate student organization was invited to send a representative to a focus group. Focus group participants were asked three questions (1) What are you most dissatisfied with regarding current library services? (2) What services do you expect from the library?, and (3) If you could add one service to current library offerings, what would it be?

5. 2001 SACS Self-Study-Survey

The following information was drawn from survey data gathered as part of Clemson University's 2002 Self-Study regarding Library Resources and Facilities.

Library Teaching/Learning Resources - A majority (64.3%) of faculty, staff, deans, department chairs, and graduate students rated the library resources as good or very good for their teaching and learning needs. Off-campus graduate students provided the highest ratings with 79.3% reporting that library resources for learning were good or very good. The faculty gave statistically significant ($p<.05$) lower ratings than staff and on and off-campus graduate students, with 56.6% rating library resources for teaching as neutral to very poor. It should also be noted that there was a statistically significant difference between on and off-campus graduate students in their mean ratings of library learning resources (see mean ratings below).

	Faculty	Staff	On-Campus Grad Students	Dean	Chair	Off-Campus Grad Student
Mean Rating	3.05	3.85	3.55	3.44	3.33	4.09

5-point scale (1=very poor, 5=very good)

Library Research Resources - A majority (55%) of faculty, deans, department chairs, and graduate students rated library resources as good or very good for their research needs. Off campus

graduate students had the highest mean rating of library research resources (3.93 on a 5 point scale). Faculty had the lowest mean rating (2.79) of research resources, a significantly lower rating than both off-campus graduate students and on-campus graduate students (3.44).

Library Services - A majority of undergraduate students rated library services as good or very good. The following are specific library services and the percentage of undergraduate students rating them as good or very good: reference/research assistance (76.3%), interlibrary loan (57.3%), Circulation (70.1%), access to teaching aids (58.8%).

Library Facilities - A majority of undergraduate students rated library facilities as good or very good. The following are specific aspects of the library facilities and the percentage of undergraduate students rating them as good on very good: group study space (81.2%), individual study space (82.9%), student research space (73.9%), space for accessing electronic references (67.6%), overall appearance (70.8%).

Print and Electronic Collections - Among the graduate students surveyed, 60.6% agreed or strongly agreed that the print collections maintained by the University libraries are effective in supporting educational programs in their major. A smaller percentage or graduate students (52.9%) agreed or strongly agreed that the print collections are effective in supporting research programs in their major. A statistically significant difference ($p<.05$) in mean agreement with the statement concerning print collection effectiveness in research was observed between on-campus (mean = 3.24) and off-campus (mean = 3.56) graduate students.

Graduate students reported similar levels of agreement concerning the effectiveness of the electronic collections maintained by the University libraries. Among those surveyed, 61.5% either agreed or strongly agreed that the electronic collections are effective in supporting educational programs in their major. As in the print collection survey results, a slightly smaller percentage (56.6%) of graduate students agreed or strongly agreed that the electronic collections are effective in supporting research programs in their major.

Use of Results and Conclusions

The assessment activities have taken place over a considerable period with many participants, the findings have been used by the Library staff and administration for improvement. Some of the specific findings are described below. Following the descriptions is a brief summary of the results incorporated in the 2001 Assessment Report for the Libraries. It is evident that the Library undertakes assessment activities. The results of assessment are used to bring about changes and are used in planning improvements.

Clemson University Self Study for SACS Reaffirmation, 2002

Following the requirements of Section V SECTION V: EDUCATIONAL SUPPORT SERVICES, the University Principal Committee examined the library facilities at Clemson University. The draft summary findings are described in this section.

Major strengths of the Clemson Libraries include their prominence among University priorities and having a clear plan and direction for the future. Clemson is placing significant emphasis on discovering and developing the programs and services that an academic library needs to provide in the 21st century as well as improving its Libraries in the traditional sense (being storehouses of information) A University-wide discussion, led by Clemson President James F. Barker, is under way to shape the Libraries' future. This discussion has resulted in four key decisions:

- Traditional quantitative measures, especially those dealing with size of collection, will not be the sole standard used to measure the achievement of the Libraries' goals; rather, success will be defined as providing the information, services, and facilities for the University to do its job of research, service, and teaching (including lifelong learning) in the most efficient and effective manner possible.
- The Libraries will actively seek and initiate mutually beneficial collaborations with partners within and external to the University.
- The Libraries will place increasing emphasis on providing electronic access to information, with a major focus on providing information electronically to the user's desktop.
- The main library facility, The Robert Muldrow Cooper Library, will become an academic "community center" or gathering place that encourages interaction and collaboration between and among students, faculty and staff.

Further, a fund-raising drive called "ONE Clemson" has been launched to raise money for both the Libraries and an athletic heritage center, with 60 percent of each gift being earmarked for the Libraries. President Barker has described this effort as "tangible evidence that Clemson encourages excellence in mind, in body and by every standard by which great universities are judged."

A major shortcoming of the Clemson Libraries is lack of space. Specifically, more room is needed for storage of little-used books and materials and to accommodate the Cooper Library's growing role as a gathering place for collaboration and communication by the academic community. The Libraries also need to boost their book collections. While the number of volumes on a library's shelves is not an absolute measure of its quality, keeping pace with the demands of a major university requires constant attention to boosting access to and availability of books. As reflected in their strategic plan, Clemson's Libraries must expand their holdings of monographs with particular emphasis on undergraduate disciplines that rely heavily upon this form of publication. The goal is to build a recurring budget of $1 million annually for monographic purchases.

University Assessment Committee

Although the purpose of the Univeristy Assessment Committee's Subcommittee on the Library Assessment Project was to recommend new assessment techniques and measures for the Clemson University Libraries, one obvious conclusion from the study is that users are concerned about access to resource materials. Part of the problem appears to be user knowledge of the electronic databases, as well as the transition from one format to another (e.g., PsycLit to PsycInfo). For faculty and graduate students, library support of research areas is a critical issue.

A second conclusion is that the library is as important as a campus center as it is as a storehouse of materials. The environmental quality of the library contributes a great deal to the users' experience. Creating a pleasing environment might dramatically change users' reactions to the library, as well as user behavior. All user groups consider this issue an important one, but it is perhaps most important to undergraduate students.

Third, part of the issue of access to library resources is the operating hours of the facilities. Undergraduate students, in particular, believe that the library should be open at all times, both to allow research and to provide a suitable study and meeting space. Many students choose to study late at night and research projects as close to due dates as possible, so ready access to library materials is a priority for them.

Fourth, in general, users expressed high regard for the work being done in the library with seriously limited resources. The library faculty and staff deserve a great deal of credit for maintaining a high level of service under difficult conditions.

The Dean of the Libraries received the following recommendations from the committee. These recommendations will be incorporated in the Assessment of the Libraries during 2001-02.

1. Continue improving access to materials. Electronic access is sufficient, but requires the technical support to ensure that access is not lost during "down" times.
2. Increase operating hours. Move toward having Cooper Library open 24 hours.
3. Institute on-line account management for library users.
4. Consider environmental quality as the library is remodeled. Users complained about excessive heat, odors, and lack of light in areas of the library. Also, as materials are moved to remote storage, accommodate requests for more space for group meetings.
5. Improve communication with library users. Users do not seem aware of library services and want better information about materials and training. Better use could possibly be made of departmental liaisons, but students expressed a desire to have regular updates about library services, as well. Additionally, there were complaints about signage in the library.
6. Consider alternatives to current journal check out policies for graduate students. Although students suggested a longer check-out period, another possibility would be a 24 hour period with a higher allowance of journals.
7. Conduct a library usability study. A usability study could address in detail the issues of user knowledge of resources, ability to locate materials in the library or on-line, and environmental barriers to using the library facilities. The Clemson University Department of Psychology has a graduate program in this area and faculty with a great deal of expertise in conducting such studies.

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Many of the Library activities demonstrated accomplishment of the selected objectives. For example, Objective 1 *Provide information resources and services to our users when they need them with a heavy emphasis on providing information electronically to the user's desktop*, was achieved by obtaining on-line journal services for three electronic journals, purchasing hardware and software (ILLIAD and ARIEL, Baker and Taylor's Title Source II). Other changes included adding or upgrading databases and reference resources. Eight eBooks used for the pilot Popular Reading project circulated an average of 10.5 times each between May 2000 and February 2001. Since the devices circulate for 4 week, the statistics indicate that generally all the devices were checked out all the time. User response to eBooks was favorable. The project will continue with the original eight books plus an additional five RCA Books. The ASERL purchase of a collection of electronic books from NetLibrary was completed; means to assess the use of this collection have yet to be devised.

Other changes to the library address findings or recommendations regarding facilities and services. Library facilities will be opened on a 24-hour basis; Gunnin Architecture Library was open from Sunday at 2 p.m. to Friday at 5 p.m. Fall and Spring semesters. Based on the patrons response that these changes were helpful; these hours will continue next academic year. Services have expanded beyond the 'warehouse' concept of a library as a direct result of service evaluation. A Cyber Café operated by ARAMark was created in the 5th level lounge area. Java City went into operation during Spring Semester 2001

Services continue to be improved based on survey responses and comments from patrons. Such services are the purchase of two digital microform reader/printers and a Printing Output Facility with

large format printer and engineering copier has been established in the Architecture Library, which serves the needs of all Library users. Patron response has been favorable. One Scanning Station was set up in Cooper near the Circulation desk. Patron response was favorable, and demand was so heavy that a second Scanning Station was added. This is currently the only location on campus offering scanning services to all students, faculty and staff.

Seventy new employee workstations were installed. The employee workstations were used to upgrade all the public workstations, resulting in machines for the public that are only two years old and more powerful. Collaboration with the campus planner continues as the university prepares for the long-term renovation of Cooper Library. Meetings were held with the campus planner and the architects employed by the University to develop the University's Master Plan. In those meeting the long-term facility needs of the Libraries were reviewed. These included the need for remote storage facility and the complete renovation of Cooper Library. In the interim, the Ad Hoc Materials Relocation Group has worked with liaisons to identify candidate materials for weeding or storage. A storage room on Level 1 was designated as a temporary holding area for approximately 9,000 volumes. The room has been cleared and shelving ordered. Policies and procedures for moving approximately 7,200 serial volumes to a storage location within the Cooper Library have been determined. Shelving has been ordered and the packing and storage of the materials will commence after shelving is installed.

Increase shared resources and reduction in service time are two additional enhancements. Increase reciprocal ILL agreements to improve the Libraries' ability to share resources with other libraries. Agreements with 5 additional institutions have been established Clemson University Libraries has joined the ASERL KUDZU project which allows our users to get rapid delivery of materials from the other thirteen participating research libraries. Turnaround time for receiving borrowed materials has dropped dramatically.

It is evident that the Dean of the Libraries and his professional staff collect, analyze, and use assessment data in decision making. The information becomes the foundation for improvement in facilities and services. The quality libraries are the underpinning of the quality teaching, research, and service that Clemson offers.