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in the areas of diversity although much still must be accomplished to realize the university’s philosophical position that diversity enhances the quality of the university community.

**Criterion Three:** "*The Institution is accomplishing its educational and other purposes.*"

The academic programs at Purdue University are strong and rigorous. All programs subject to professional or disciplinary accreditation have received it from the relevant accrediting agencies. We have previously noted that Purdue University is decentralized with academic planning, programs and curricula being the primary responsibility of the schools with close monitoring by the central academic leadership. We shall report on each of the schools individually in the following section, but suffice it to here observe that we found in our reviews of the schools a commitment to collaborative endeavor with academic neighbors and with a strong commitment to quality in teaching, research, and service programs. We include as the most immediately relevant observations concerning criterion three are student assessment, new teaching initiatives, organization and investment in the research infrastructure, technology commercialization as an exemplar of outreach and putting knowledge to work, and undergraduate enrollment management.

**Student Outcomes Assessment:** In consonance with the campus-wide Excellence 21 program devoted to continuous quality improvement, the university has developed a strong student outcomes assessment plan which appears to enjoy broad faculty support. The university’s revised assessment plan was accepted by NCA in January 1997. Since then the plan
Purdue University (West Lafayette) has been implemented under the leadership of the University Assessment Council. The Council is comprised of an assistant or associate dean from each school who serve as the assessment coordinator of their respective schools; it is chaired by an Associate Executive Vice President for Academic Affairs. In keeping with Purdue’s decentralized structure, the faculty of each school define and implement their own assessment programs, but do so within an institutional model and a set of common principles set forth in the general university plan.

Purdue’s assessment model includes four key elements for promoting student learning: 1) defining intended learning outcomes; 2) creating an environment for promoting student learning; 3) gathering data about student learning using appropriate measurement activities; and 4) communicating and using assessment data to improve teaching and learning. The University Assessment Council has developed a set of general, university-wide, intended learning outcomes both for general education and the major. These outcomes have been accepted by the university community, and the faculty within each of the schools formulate specific learning outcomes in harmony with them. The principles that undergird the model reflect best practice in assessment, focusing on faculty ownership, use of multiple sources of information and multiple measures, an emphasis on assessing for improvement rather than accountability alone, and continuous rather than episodic assessment. In addition, assessment has been linked to strategic planning and integrated into program review.

Assessment progress reports were available for all schools. A review of the reports confirmed a university-wide emphasis on developing intended learning outcomes as the basis of assessment. It also revealed that progress beyond formulating outcomes is somewhat uneven.
Purdue University (West Lafayette) across departments. While the vast majority of units are using assessment results to modify the curriculum and instructional approaches, a few have yet or are just beginning to collect data. Faculty have made more progress assessing learning in their undergraduate programs than they have in their graduate programs, and to this point appear to use indirect measures of learning (e.g. alumni, employer, student surveys) more than direct measures of learning (e.g. papers, projects, portfolios, performances).

Within a relatively short period of time and with a remarkable level of faculty involvement and commitment, student outcomes assessment has been successfully established at Purdue as a university initiative. The framework is in place for continued progress, and leaders are committed to fostering this progress at both the school and university levels. An effective outcomes assessment program can be instrumental in helping faculty make the transition from a teaching focused to a learning focused paradigm – a major cultural shift in institutions of higher education, particularly research universities. The university has established that ultimately the Executive Vice President for Academic Affairs and the deans of the various schools are responsible for ensuring that outcomes assessment is successfully incorporated into the culture of the university.

New Teaching Initiatives: There are a number of interesting new teaching initiatives at the undergraduate level that range from the creation of a teaching academy, a center for instructional excellence, and the multi-media instructional development center, to faculty mentoring (Teaching for Tomorrow Program), special seminars (Conversations about Teaching),
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and a greater emphasis on assessment. The need for these initiatives was outlined by an appointed Presidential committee which presented its report in 1993 to address undergraduate education. The resulting “report identified ten essential components for creating a supportive community of teacher-scholars” and propelled a renewed emphasis on teaching campus-wide. The initiatives have been developed to address the ten points, most importantly to improve student retention, create an atmosphere of collegial faculty support, and generally improve the quality of teaching and learning.

Perhaps the largest retention initiative is the result of an external grant. The Lilly Retention Education program seeks to increase the undergraduate completion rate by 5% by the end of the five year support period (1997-2002). Results from the first year showed the planned 1% increase. The West Lafayette campus portion of the $5 million Purdue system grant ($3.5 million) has been used thus far to fund programs such as Summer Start, the undergraduate honors and research experience, living/learning communities, and faculty and research assistant development programs.

It is apparent that initiatives, such as the Teaching Academy, have enabled the formation of alliances and provided paths for collaborative discussion among faculty from a variety of disciplines. Through Academy auspices and the volunteer work of its 100 outstanding teacher members, successful activities have been developed. “Conversations about Teaching” and “Focus on Teaching” seminars and workshops have provided campus-wide forums for discussions about teaching innovation and a means for cross-disciplinary collaboration. The “Teaching for Tomorrow Awards” initiative teams two of Purdue’s best senior faculty with 8
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assistant or associate professors for the purpose of improving teaching skills that will facilitate learning. Uniquely, these awards are funded by an alumni endowment.

Of special merit among the numerous initiatives in the innovative use of technology in teaching is the annual Teaching Learning Technology Showcase. This is a marvelous way to make the campus aware of the excellent and innovative teaching ideas that are being pursued on campus. The annual Excellence 21 all-campus poster session also provides a meaningful venue for sharing school and departmental continuous quality improvement projects, many of which focus on student learning outcomes assessment, curricular reform, and instructional innovation.

The individuals with whom we spoke were extremely enthusiastic about these varied initiatives and were eager to explain the benefits that each brought to the campus. Although these initiatives are campus-wide and informally coordinated through the office of an Associate Vice President for Academic Affairs, there is no institutionalized coordination. At the moment this does not appear to be a problem as each of these initiatives make very different contributions to the teaching mission of the institution, and the individuals involved have developed an excellent communication network and a consultative relationship. But as new initiatives develop or the personnel changes, as they certainly will, there could arise unneeded duplication of effort as well as loss of the web of connections that makes the current set of programs in such a decentralized environment so effective. One suggestion is that some oversight committee composed of representatives form these key initiatives be given responsibility for coordination and monitoring of new initiatives on a long-term basis.
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**Research Infrastructure:** A distinguishing feature of the top tier midwestern research universities has historically been an expansive, campus-funded research infrastructure. As one of these elite institutions, faculty investigators at Purdue have prospered from low cost access to state-of-the-art facilities. Many new and significant research initiatives can be traced to enabling technology that has emerged from the university’s sustained infrastructure investment. Purdue now faces, along with its peer institutions, the challenge to keep pace with new and often stunningly expensive technologies. There is evidence that Purdue has looked critically into the future, set priorities and invested boldly in the most critical areas.

Networking and information technologies are among the most enabling and pervasive of all elements within the modern research university. Over the last five years Purdue has made remarkable strides in developing and implementing a network strategy that is establishing a contemporary state-of-the-art information technology infrastructure to support research. It appears that plans and resources are in place to sustain this effort.

The establishment of campus core research facilities (e.g., electron microscopy center and genomics center) is an effective strategy to stay abreast of very costly facilities, and provide expert support while minimizing costs by minimizing duplication.

The Purdue research community and administrative leadership have been very proactive in identifying and prioritizing new research initiatives. Campus leadership is to be credited for taking the initiative to organize Saturday workshops designed to leverage the best ideas for multidisciplinary research from the research faculty. The continued and accelerated growth in sponsored research is evidence of their success. Plant genomics is an excellent example in which
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the university has, in a very short amount of time, established a national presence in an area
where federal funding is rapidly growing. The university has also enjoyed very significant growth
in industrial and foundation funding over thee past five years, an area that appears to have
enjoyed strong leadership. The simplification of contracts and flexible and realistic attitudes
about intellectual property issues appear to have significantly lowered barriers for university-
industry research cooperation and development of partnerships.

As the university looks forward attempting to anticipate obstacles in the path of its
research enterprise, several stand out. It appears the suitable laboratory space will increasingly
become a limiting factor in the further growth of sponsored research. Important new buildings
for Engineering and Computer Science are on-line but Biological Science seems “land-locked” in
Lilly Hall and genomic initiatives in the School of Agriculture may be delayed or stalled for lack
of adequate remodeling funds. While the Academic Reinvestment Program has funneled
important new dollars toward Purdue’s research infrastructure, the University appears to be at a
significant disadvantage with its peer institutions without direct return of ICR dollars to support
this centrally critical element of a research university.

In an important related set of activities, the Purdue Research Foundation (PRF) has
embarked on a venture to encourage development of companies for technology
commercialization of Purdue faculty research. The Purdue Research Park was begun several
years ago on land originally designated as a research farm. The PRF purchased a replacement
farm in trade for the present land. During the past year several steps have been taken to
accelerate the activities in assisting formation of new companies.
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The Purdue Gateways program (started in October 1998) helps prospective companies with organizational development, development of business plans, legal counsel, and the collective experience in new business development. They form a Gateways Task Force for each company that has individuals from Purdue and PRF plus individuals outside those organizations as members. This Task Force recruits a mentor to assist the company by helping to find and recruit an individual who has experience in similar technologies as well as has awareness of relevant markets. They help form the management team (usually not the technical expert), help secure financing, and Gateway will spend a lot of time with them. Gateway support is provided free. In a few instances, but not all, PRF will take an equity position in a new company for the support provided.

Gateway will work with faculty innovations that can lead to a company formed by the faculty member or people who license faculty-developed innovations. The operating expenses of Gateway are secured by the rents collected from the tenants in the new Purdue Technology Center building.

The Gateways program works with about 5-6 start-up companies per year, with additional opportunities for collaboration with others from outside the university. There have been several successes, the most dramatic perhaps being Bio-analytical Systems, and Gateways must now pick and choose among fledgling contenders for support some of which are more viable candidates for successful commercialization than others.

Three buildings are dedicated to support of start-up companies. The Business and Technical Center (BTC), which has wet lab facilities, houses 20-30 companies. The Purdue
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Technology Center (PTC), which was completed in May 1999, is an incubator facility with space primarily for IT type companies. Another building, dedicated to support of companies that "graduate" from the incubator facilities, has just been completed. The PRF paid for the PTC in cash to provide for the tenant companies. The newest building was constructed by the PRF as an investment and the rents collected are the return on the investment.

The commercialization of research at Purdue involves students as well as faculty. One such initiative is an endowed student entrepreneurial competition in the Krannert School of Management that involves engineering students teamed with management students. Each group in the competition develops a plan for a new company using some technology-based idea. The plans are judged by representatives from venture capital organizations with the winner receiving $25,000, free space in the BTC for a year, and free legal service. Some participating venture capital firms have offered even more support for plans submitted in the competition.

Purdue's technology and start-ups are being evaluated by the Corporation for Investment Development (CIDC) which is a venture capital organization. In addition, the work of PRF and Gateways is being noticed by venture capital firms on the West Coast. They have also formed a partnership with the Penn State Research Park in order to support and to grow complementary companies.

**Enrollment Management:** Purdue University has a well-organized and functional enrollment management process, an important element in the university's successful achievement of its educational mission. This process involves representatives from Student Services, Office of
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Admissions, Budget and Fiscal Planning, Financial Aid, Registrar, and Academic Affairs. This group has developed strong communication links coupled with an enrollment model that enabled them to predict within 0.7% the number of incoming freshmen students in fall 1999. These predictions further allowed Academic Affairs to release in a timely manner $1.5 million in additional funds to relevant academic units in order that additional sections of the necessary courses could be available to incoming students in anticipation of their arrival and enrollment. These funds were released in late spring to meet the classroom and academic support needs of a class of 7,300 freshmen.

The University is now at capacity in physical space as well as faculty resources. They are managing enrollments to hold down growth. They work to recruit the very good students. The overall composite ACT of the incoming students is about 25. The present enrollments are about 70% from Indiana and 30% from outside the state. The admission requirements vary depending upon the school. The Office of Admissions has determined that the best predictor of success of a student is high school academic performance in academically rigorous courses.

The university is working to diversify the student body through special programs both on and off campus. As part of the on-campus program a special reception is convened for minority students which enables those participating to meet, converse, and get to know other students of color. The university also supports programs in the K-12 grades to make students aware of higher educational opportunities generally, not just at Purdue. They send special publications to those applicants who have identified themselves as of color. The African American enrollment in the freshman class was up 24% in fall 1999 compared to the previous year. The university has
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also been dedicated to recruiting minority students from the Historically Black Colleges for graduate school, and has enjoyed considerable success in this endeavor.

The enrollment management group works hard to coordinate all areas of the university in the enrollment management function. Enrollments have a strong budgetary impact so it is very important for the Budget office to be involved. They are on a good course with a high degree of communication but the academic programs drive what they do. This group is commendable in its efforts and its results. It is characterized by good working relationships and success in managing enrollments for the institution.

Criterion Four: "The Institution can continue to accomplish its purposes and strengthen its educational effectiveness."

Purdue University has demonstrated its ability to manage its resources effectively and to define, set, and pursue its educational priorities in clear and effective fashion. Many of the particulars germane to this consideration have already been elaborated above. Given the dimension of decentralization at Purdue, we feel that the quality and commitment to continued educational effectiveness can be usefully seen in the character and activities of its schools and other major academic units.

The School of Agriculture at Purdue University is a major asset to the nation and the State of Indiana. It is recognized globally for the excellence and productivity of its faculty, students, and alumni. Over the years, it has demonstrated a service-oriented attitude both on- and