University Classroom Committee

Report

To the Provost

2000-2001

Committee members

Kenneth R. Bain, *Searle Center for Teaching Excellence*
Pamela Cooper, *Communication Studies, School of Speech*
Stephen D. Fisher, *Office of the Provost*
Sameer Gafoor, *Academic Vice President, Associated Student Government*
Edward P. Kerros, *Law School*
Paul A. Loach, *Biochemistry, Molecular Biology and Cell Biology, WCAS*
Marvin Lofquist, *Chemistry, Assistant Dean for Physical Sciences, WCAS*
Franziska Lys, *German, WCAS*
Michael E. Maysilles, *Office of the Registrar*
Ronald Nayler, *Facilities Management* (co-chair)
Joseph L. Schofer, *Civil Engineering, McCormick*
Jean E. Shedd, *Office of the Provost* (co-chair)
Robert L. Taylor, *Academic Technologies, IT*
Paul B. Weller, *Facilities Planning, Facilities Management*
Lonnie R. Williams, *Operations, Facilities Management*

CLASSROOM COMMITTEE REPORT FOR FY 2001

INTRODUCTION

The Classroom Committee was established by the Provost in January 2000 and charged with evaluating classroom use and quality, and recommending to the Provost and the Deans policies on classroom utilization, scheduling, physical improvements and priorities for assignment. The Committee includes representatives from the faculty, Dean's staff, the Searle Center for Teaching Excellence, Office of the Registrar, Information Technology, Associated Student Government, Facilities Management and the Provost's Office. One of the gratifying outcomes of the establishment of the Classroom Committee has been the strengthened collaboration and communication among these participants.

Much of the work of the Classroom Committee is accomplished through the three subcommittees that focus on teaching methodology and technology; classroom quality; and classroom utilization. Additionally, the co-chairs work with faculty and staff from the Chicago campus to explore improvements in the quality and utilization of classrooms in Chicago. A recurring allocation of $500,000 has been established for the Classroom Committee to address priority needs.

FY 2001 PROGRESS

Budget Allocation:

The Classroom Committee allocated its $500,000 budget to address two issues identified through last year's survey of classroom users as high priority issues:

- Upgrading eight smart classrooms (Fisk 201, Harris 107, Swift 107 and Tech A110, MG28, LR2. LR3 and LR4) at a total cost of $238,000. The Committee provided $160,000 and Academic Technologies (AT) provided the remainder of the funding. Additionally, AT upgraded all network ports in all NU Smart Classrooms during the summer of 2001 to Switched 10/100 (from Shared Ethernet) at a cost to AT of ~$20,000.
- A major renovation of Swift 107 (the general purpose classroom in the worst physical condition) at a total cost of $375,000. The Committee provided $340,000 and Facilities Management provided the remainder of the funding.

Both projects were undertaken in Summer 2001 and were completed in time for the start of classes in Fall 2001.

Smart Classroom Repair and Renewal

Based on an analysis by Academic Technologies and the Classroom Committee, the Committee recommended that the University allocate additional recurring funds to put existing smart classrooms on a ten year repair and renewal cycle. Central Administration allocated $112,000 to AT in recurring funding to supplement their existing $75,000 to achieve this objective. (See Appendix I)

Barris Gift

A $500,000 gift from Peter Barris enabled the University to create six new smart classrooms (University Hall 121, Kresge 104, 155, 303 and 335, and Searle 2-107).

$200,000 was allocated for the capital costs of creating the classrooms and $300,000 was allocated to provide recurring funding for their repair and renewal. All projects were undertaken in Summer 2001 and were completed in time for the start of classes in Fall 2001. (See Appendix I)

Classroom Condition Survey

Facilities Management completed a detailed assessment of the physical condition of general-purpose classrooms and identified the annual recurring cost of repair and renewal as ~$410,000. Significant information was gathered on the condition and cost of furniture, flooring, lighting, window treatments and painting. Information was also gathered on the condition and cost of chalk/marker boards, projection screens, overhead projectors, speakers, TVs and HVAC systems; additional analyses are required in these areas. The repair and renewal cost of items in the two worst (of five) condition categories totals ~$1,250,000 and consists of items that should be undertaken as soon as possible. Accessibility is an issue in Harris and Lunt; provision of elevators in those buildings could cost in excess of $1,000,000. Harris, Lunt and Kresge have no central air conditioning; approximately 15% of the space in each building is used for classrooms. Air conditioning these buildings could cost in excess of $5,000,000. (See Appendix II.A.).

General Classroom Upgrades

In Summer 2001, Facilities Management undertook ~$100,000 of improvements in 21 separate classrooms in the areas of flooring, painting, lighting, window treatments, etc. All work was completed in time for the start of classes in Fall 2001. (See Appendix II.B.)

Classroom Utilization

In response to a request from Central Administration for additional information on the potential for reassignment of classroom space, the Committee further analyzed classroom utilization statistics. Current rates of utilization are below the targeted rates and a reduction in the number of classrooms in Evanston could be accommodated. New construction on the Evanston Campus will result in the addition of nine new classrooms with a total capacity of 825 seats. This new construction offers additional opportunities for replacing existing classroom spaces that could be used to meet other programmatic needs. In order to take maximum advantage of these opportunities, the Committee needs to develop and recommend implementation of policies regarding central scheduling of these new classrooms. Elimination of any classroom(s) has to be considered on a case-by-case basis to take into account the impacts on: alternative locations and times for the scheduled classes; the ripple effect on current scheduling; the potential to decrease crowding in existing classrooms; and the potential to convert existing classrooms to flexible configurations. (See Appendices III and III.A.)

Flexi-Classrooms

The Committee refined the concept of the use of technology in classrooms with the goal of seeking funding both externally and internally. The Committee developed a concept for a hi-tech, wireless, flexible classroom in Tech MG51 to incorporate active and cooperative learning. It was noted that a classroom of this type would facilitate several

courses in the Undergraduate Program for Biological Sciences (UPBS) and that there was significant interest on the part of the UPBS faculty in utilizing a classroom like this. The Humanities faculty also expressed interest in using flexi-classrooms. Although the Committee's request for funding in FY02 was not successful, the Committee and Academic Technologies continue to discuss ways in which this concept could attract external funding and ways in which a more limited version of this concept could be implemented using existing resources. (See Appendices I.A. and I.B)

Chicago

The upgrading and cooperative scheduling of Wieboldt classrooms has been a primary focus in Chicago. Good progress has been made this year. A conceptual plan for the conversion and upgrading of Wieboldt classrooms to meet the Law School's needs and the needs of the School of Continuing Studies has been developed and has the support of both Deans. The Medical School has agreed to review the potential of participating in this venture.

FUTURE EFFORTS

Even though the Committee was able to complete a large number of work items that were identified during its first year of existence, a substantial amount of work remains to be accomplished. The efforts of the Committee in FY02 and beyond will be focused on:

- Continue upgrade of existing smart classrooms in concert with AT.
- Review desirability, cost and impact of converting additional general classrooms to smart classrooms (Coon Forum and Ryan Auditorium, among others, to be reviewed as candidates).
- Seek external funding to implement high priority projects.
- Refine evaluation of classroom conditions and determine priorities for funding.
- Develop a long-term plan for the Committee that would place NU in the forefront of classroom education.
- Develop and implement mechanisms that encourage and aid faculty in using innovative pedagogies to improve student learning; provide the flexible, physical environments that optimize student learning.
- Refine the utilization analyses to specify the potential classrooms for: conversion to other programmatic purposes; conversion to flexible configurations; and decreasing crowding.
- Develop policies regarding central scheduling of new classrooms being constructed.
- Implement new, general purpose scheduling guidelines.
- Review and analyze the use of classroom spaces scheduled through Schools and Departments.
- Develop and recommend funding for a plan for the upgrading and cooperative scheduling of Wieboldt classrooms; bring the Kellogg School and the Medical School into the discussions.

APPENDICES

Appendix I

Teaching Methodology/Technology Subcommittee Report (2001)

Subcommittee members: Kenneth Bain (Chair), Paul Loach, Franziska Lys, Bob Taylor

Initial Charge
The initial charge to the committee was to investigate whether there are other ways (than the "Smart Classrooms" model) in which we can use computer technology in the classroom that will improve learning by promoting:

- instructor-student and student-student interactions
- active learning and time spent on task
- easy access to computer based materials.

Kenneth Bain presented a report (for a full report see Appendix 1) in which he summarized research and theoretical literature on human learning. The report suggests that more students will learn more deeply (in ways that have a sustained, substantial, and positive influence on how they think, act, or feel) if: (1) they are trying to solve problems (intellectual, physical, artistic, practical, abstract, etc.) that they find intriguing, beautiful, and/or important; (2) they are able to do so in a challenging yet supportive environment in which they can feel a sense of control over their own education; (3) they can work collaboratively with other learners to grapple with the problems; and (4) they can try, fail, and receive feedback from expert learners in advance.

Discussion
In the subcommittee we discussed several proven uses of technology in classrooms that are consistent with these research-findings on human learning. The sub-committee members were intrigued by the Flexi-Classroom model represented by the classrooms in the Tarry Collaborative Learning Center at Northwestern University. (The Tarry Center room features flexible furniture and mobile technology encouraging faculty members to incorporate active and cooperative learning thus increasing faculty-student interactions.) A visit to the Tarry Center in Annenberg 303 was arranged. In the ensuing discussion, the majority of the sub-committee members supported using the Barris funds to create at least two (if not more) electronic classrooms along the lines of the studio or flexi classrooms (one on the north campus and one on the central or south campus).

Specifications for the Flexible Classrooms

They should:

- be networked (1 socket for 2-4 students, 2 sockets for instructors - or wireless technology);
- have flexible furniture - lightweight, durable, moveable tables (for a max of 6 students each); movable instructor table/podium/console, movable chairs;
- have a portable computer projection system for each room;

- have appropriate computer or laptops for check-out by students;
- have appropriate software for classroom interaction / communication

However, there was strong administrative sentiment expressed, for building only one such room and using the remainder the Barris funds to build more "projection-type" electronic classrooms of the type that already exist on campus.

A Flexi-Classroom for the Sciences (Tech room MG51)
Tech room MG51 was identified as a possible classroom for creating the first Flexi-Classroom in the Sciences. A detailed analysis was begun in order to provide an estimate of expenses and a timeline (for a full report by Paul Loach see Appendix 2). Several meetings were held to evaluate the space, HVAC, lighting, and anticipated furniture, room ambiance, computer, video and projection equipment needs. Another visit to the Tarry Center in Annenberg 303 helped provide a realistic estimate of furniture and capacity.

Bob Taylor provided an estimate for this project which totaled $ 200'000. In addition, a recurring budget of $ 25'000 to $ 35'000 per year would be required to replace and enhance equipment estimated (the full estimate is available through Bob Taylor). This estimate was much higher than anticipated and the gift from Peter Barris, would not be sufficient to fund the flexible classroom. It was decided that the proposal would be forwarded to the administration for possible funding in 2002. In the recently concluded budget planning process, however, funding was not allocated for the fiscal year 2002 to build a flexible classroom for the sciences.

Additional Smart Classrooms
The gift from Peter Barris, although not sufficient to fund the Flexi-Classroom for the sciences, would be sufficient to build additional "smart" classrooms on campus.

The committee met to discuss the conversion of six regular classrooms to "smart" classrooms. Franziska Lys presented the results of a recent discussion with the Council on Language instruction, which showed that there was serious concern about the classroom situation in Kresge. There are not enough classrooms for language teaching, and with the scheduled renovation of Kresge, additional classrooms might become unavailable. Because of the way multi-section classrooms are scheduled, they have to be taught in the same building to assure that the material can be transferred between classrooms. Additionally, there is only one "smart" classroom in which is not enough for the current technology and project oriented language instruction. Franziska Lys proposed to add more "smart" classrooms to Kresge and to split Kresge 153 (the largest classroom in Kresge and underused) into two classrooms to increase the number of classrooms in Kresge. It was decided that splitting Kresge 153 would not be feasible at this point. The committee chose Kresge 104, 155, 303 and 335, and University Hall 121 and Searle 2-107 for the renovation to "smart".

Long-Range Plans
Push for the creation of Flexi-Classrooms to widen the interactive uses of technology.

Push for the creation of interactive and flexible ‘non-electronic' classrooms.
Help develop faculty approaches to teaching that can utilize such technology and classrooms in ways best suited to promote ‘smart' students and deep learning.
Explore the possibility of using effective videoconferencing technologies in support of new courses at Northwestern. Four NU courses this Spring Quarter used videoconferencing services on a continuing basis to conduct classes among students across multiple universities. (Two courses were from Engineering, one from Law, and one from English.) We expect this number to at least quadruple in the coming academic year. A cross-school initiative was funded this spring for the development of a Neuroscience Program at NU, and all of these courses and seminars will be supported across the Chicago and Evanston campuses in FY02 by new videoconferencing investments. There is much that NU faculty needs to learn about the most effective use and configurations of these videoconferencing services.

Appendix I. A.

Smart Classrooms or Smart Students

Question: Do "Smart Classrooms" (As we have known them in recent years at Northwestern), by themselves improve learning, or are there other ways to use computer technology in the classroom that will improve learning even more?

The research and theoretical literature suggests that multi-media (visual-based) presentations will not, by themselves, produce significantly deeper or more extensive learning than will teaching without out such electronic media. Indeed, comparisons that have involved the same professor have produced the smallest differences (see, for example, Bonwell and Eison, *Active Learning*, 33-34; Cohen, Ebeling, and Kulik. A Meta-analysis of Outcome Studies of Visual-Based Instruction. *Educational Communication and Technology Journal*. 1981: 26-36. T. R. Russell. Explaining, Exploring [and] Understanding the No Significant Difference Phenomenon. *Adult Assessment Forum*. Winter 1997:6-9; T. R. Russell. 1999. *The No Significant Difference Phenomenon*. Office of Instructional Telecommunications. North Carolina State University.). There seems to be little reason to believe that a PowerPoint presentation, for example, will produce deeper or more extensive learning than will the same presentation by the same professor using an overhead projector or even a blackboard.

The research and theoretical literature on human learning does suggest, however, that more students will learn more deeply (in ways that have a sustained, substantial, and positive influence on how they think, act, or feel) if (1) they are trying to solve problems (intellectual, physical, artistic, practical, abstract, etc.) that they find intriguing, beautiful, and/or important; (2) they are able to do so in a challenging yet supportive environment in which they can feel a sense of control over their own education; (3) they can work collaboratively with other learners to grapple with the problems; (4) they believe that their work will be considered fairly and honestly; and (5) they can try, fail, and receive feedback from expert learners in advance of and separate from any summative judgment of their efforts.

Much of what that means for good teaching practices has been captured in the "Seven Principles for Good Practice in Undergraduate Education." (Chickering and Gamson, AAHE Bulletin, March, 1987.):

1. Good Practice Encourages Student-Faculty Contact;
2. Good Practice Encourages Cooperation Among Students;
3. Good Practice Encourages Active Learning;
4. Good Practice Gives Prompt Feedback;
5. Good Practice Emphasizes Time on Task
6. Good Practice Communicates High Expectations;
7. Good Practice Respects Diverse Talents and Ways of Learning.

If our primary goal is producing smart (learned) students rather than "smart" classrooms, our question should be:

Can we create electronic classrooms that will better enable and encourage faculty members to create the optimum learning environments (using the insights about learning that have emerged from the learning sciences)?

In other words, we want to make technology a servant of learning.

In the subcommittee we discussed several proven uses of technology in classrooms that are consistent with the research-findings on human learning and the "Seven Principles for Good Practice." They are 1) Studio Classrooms, 2) ClassTalk and similar systems, 3) Flexi-Classroom similar to the classrooms in the Tarry Collaborative Learning Center.

Studio Classrooms: Students sit 4-8 per table; each pair has a computer and work area, students work in pairs and teams on intriguing, beautiful, important problems. Such classrooms were pioneered at Rensselaer Polytechnic Institute (RPI) a decade ago and are now adopted on dozens of campuses in Calculus, Chemistry, Physics, Statistics, Engineering, German History, among other disciplines. Studies of their use at RPI found increased student performance, increased student satisfaction, lower costs, and less in-class time. The Studio Classroom have the following advantages, all consistent with separate findings on human learning: Students are more active in the learning process; more student/student and student/faculty interaction; computers allow instant feedback; students spend more time on task; instructor presentations are more varied and learner centered; students and faculty are more satisfied with the results.

ClassTalk: Students answer questions posed by the instructor via remote devices. ClassTalk (a particular commercial product) facilitates student/student and student faculty interaction, even in large classes; it encourages active learning and time on task; it provides immediate feedback for both instructors and students. It has been used in the pedagogy developed by Eric Mazur, Gordon McKay Professor of Applied Physics and Professor of Physics at Harvard University (Mazur. Peer Instruction: Getting Students to Think in Class in *The Changing Role of Physics Departments in Modern Universities*. American Institute of Physics: 1997, and Mazur. *Peer Instruction: A User's Manual*. Prentice Hall: 1997). Mazur has found deeper and more extensive learning with such techniques.

Flexi-Classroom. The room features flexible furniture and mobile technology. Such rooms have been built at Stanford and more recently in the Tarry Center for Collaborative Teaching and Learning at Northwestern. With their flexible design, they allow and encourage faculty members to incorporate active and cooperative learning. Faculty-student interaction increases.

Three members of the sub-committee (Bain, Loach, and Taylor) attended the meeting, as did the committee co-chairs (Shedd and Nayler). The discussion centered around three ideas:

Adopting new proven models for electronic classrooms that reflect what we know about human learning and using the Barris gift to support those models.

2. Broadening the conception of what we mean by "maintenance" of electronic classrooms to include support for faculty development efforts to help faculty members use any electronic classroom in ways that are most consistent with the findings on human learning and to use part of the Barris funds for that effort.

3. Creating classroom Web pages that provide faculty members with specific information on innovative ways to use particular classrooms, providing links to proven pedagogies to deepen and broaden student learning.

Much of the discussion centered on the first of these ideas. A majority of the sub-committee members (Bain and Loach) supported using the Barris funds to create at least two (if not more) electronic classrooms along the lines of the studio or flexi classrooms (one on the north campus and one on the central or south campus). There was strong administrative sentiment expressed, however, for building only one such room and using the remainder to build more "projection-type" electronic classrooms of the type that already exist on campus.

More importantly, the sub-committee affirmed its support for a long-range vision and strategy to move toward the wider development of:

Interactive uses of technology in the classroom with the creation of studio and flexi classrooms;
Interactive and flexible 'non-electronic' classrooms more generally;
Faculty approaches to teaching that can utilize such technology and classrooms in ways best suited to promote 'smart' students (and deep learning) rather than just 'smart' classrooms.

Respectfully submitted
Kenneth Bain
November 30, 2000

Appendix I.B. Hi-Tech Flexible Classroom Proposal

At the last meeting of the Classroom Committee (12/4/00), the Teaching Methodology/Technology subcommittee was asked to identify one to three targets for our first hi-tech flexiclassroom(s) and evaluate the needs to create it. Toward this end, a special meeting (held on 1/10/01) was arranged by the Teaching Methodology/Technology subcommittee to which a few interested faculty were invited to explore new models for using advanced, primarily computer-based, technologies in the classroom to promote and facilitate student learning. A summary of topics discussed is appended to this report.

A possible location in Tech was identified and a detailed analysis begun in order to provide an estimate of expenses and a timeline for creating our first hi-tech flexi classroom. Several meetings were held to evaluate the space, HVAC, lighting, and anticipated furniture, room ambiance, computer, video and projection equipment needs. A visit to the Tarry Center in Annenberg 303 helped to provide a realistic estimate of furniture and capacity. Also initiated were possible locations in Kresge and some preliminary planning has been undertaken. Because it is likely that successful use of these new classrooms will require faculty "champions" who are using them for specific classes, the identification of such faculty and classes should be an early goal. To begin this process, faculty in the life sciences on the Evanston Campus were solicited for their interest in, and ideas for using such a classroom. An informal meeting with several such faculty was arranged to help evaluate the prospective room in Tech. A summary indicating specific interest follows. Email responses from several biology faculty are available from Paul Loach.

Current and Anticipated Needs for Education in the Life Sciences
Progress in understanding living systems has accelerated exponentially with advances in analytical technology and in the computer sophistication. Structure-function relationships are now being probed for macromolecules and supramolecular systems that require the use of large data sets available via the Internet. Highly useful software programs are also available to view, manipulate and gain insight into the role of these molecules. Along with advances in knowledge regarding complex biological systems, the methodology of enabling learning by undergraduate and graduate students urgently needs to be enhanced. The need to improve teaching in the life sciences not only impacts departments like BMBCB and NP, but also Chemistry and several divisions of Engineering on the Evanston Campus as well as the Medical School on the Chicago Campus.

Several courses currently being taught in the Undergraduate Program for Biological Sciences (UPBS) would immediately be facilitated by the availability of a flexible, hi-tech classroom in Tech. These include Biochemistry 301 and 309 (taught by Drs. MacDonald and Sontheimer, respectively), Bioinformatics 323 (taught by Radhakrishnan), Proteins and Nucleic Acids 361 (taught by Matouschek), Biochemistry of Macromolecular Complexes (taught by Loach) and Biochemistry and Biophysics 401 (team-taught by several structural biologists in the department). In addition, there is a

strong sentiment within the Undergraduate Program of Biological Sciences that the first course introducing biochemistry (210-2) should be restructured to (1) introduce the tools so useful in helping to understand this discipline (and making it fun to study), (2) enable active learning through the pursuit of projects shared by several students and the class as a whole and (3) include a focus on high-interest topics such as human disease and environmental concerns. In order to accomplish this task, a flexible, hi-tech classroom such as is being planned is essential. Because the number of students taking 210-2 is large (350-400), it is envisioned that a pilot project would be initiated involving 25 to 30 students. Assuming the results of this pilot were highly successful, ways to bring such an opportunity to the entire population of students interested in this fundamental topic would be sought - any such extension would clearly require several flexible, hi-tech classrooms (and the involvement of additional faculty). Because this topic represents such a key base to all disciplines in the life sciences, an exciting, challenging and comprehensive first experience would be most beneficial to all majors in UPBS as well as to those of several other programs (e.g., ISP, Chemistry, Biomedical Engineering, Chemical Engineering, etc). Furthermore, an innovative and more hands-on approach to learning would place Northwestern University on the forefront of education in the life sciences, which could, of course, readily be marketed in the recruitment of students.

Classroom Requirements for Tech

The goal is to have students work in pairs, in a group of four or possibly six. Each person (or group) should have a computer with an Internet connection and ability to communicate with other computers within the classroom. One or two projectors should be available to enable sharing, comparing and presenting results in adjacent or disparate locations. Special attention should be paid to ensuring that these computers have the fastest reliable processors, extensive RAM, high-resolution graphics and a large hard-drive which are needed to quickly manipulate large databases. Board and poster board space should be available on over half of the wall space around the room. Sufficient open floor space should exist to allow rearrangement of the working area and easy mobility from one site to another. Sound qualities should be excellent to allow easy verbal communication across the room. Lighting is a special consideration and stress-producing fluorescent lights should be avoided. Use of flexible, indirect illumination with light sources that reproduce the full solar spectrum is essential.

Other Thoughts

This classroom should be done really well so that it fulfills the anticipated needs and so that it can be a showpiece to the donor (and potential donors) and serve as a model for future classrooms. The Tech room MG51 is large enough for the envisioned classroom and has a nice central location - It is our hope that the air movement can be optimized for low noise and comfortable climate. Once such a classroom comes into existence, special attention should go into its utilization. If it is to serve its purpose, its use should be restricted to those courses requiring flexibility and hi-tech equipment as well as innovative teaching methodology.

Respectfully submitted
Paul Loach

Appendix II

Classroom Quality Subcommittee Report (2001)

Subcommittee members: Steve Fisher (Chair), Marv Lofquist, Joe Schofer, Lonnie Williams

The Quality Subcommittee had an active year. Jean Shedd and Steve Fisher, and later Jessica Abrams from FM, visited nearly every (general purpose Registrar scheduled) Evanston campus classroom to assess each in terms of its needs and priority for repair (minor and major), renovation, up-grading, and the like. In addition, Jessica took digital pictures. These visits and work by Jessica has resulted in a spreadsheet listing each Evanston campus classroom with projected repairs, etc and estimated costs. Summer 2001 priorities were determined and work totaling about $100,000 will be underway after spring quarter finals are over.

A major renovation of Swift 107 (costing about $400,000) will be done in the summer of 2001, as well.

The Quality Subcommittee continues to wrestle with such persistent issues as cleaning standards for custodial staff, receiving, acknowledging, and dealing promptly with small repairs (broken shades, burned out light bulbs, and the like), somewhat more complex issues such as stains on carpets, and very difficult issues like broken or poorly operating HVAC systems that make classroom environments unpleasant.

Appendix II.A.

See attached electronic file "Class Comm surv report.xls"

Appendix II.B.

See attached electronic file "Class Comm surv report.xls"

Appendix III

Utilization Subcommittee Report (2001)

Subcommittee members: Paul Loach, Michael Maysilles, Paul Weller (chair).

DRAFT OF SUMMARY REPORT & SUBSEQUENT STEPS (**June 8, 2001)**

DISCUSSION & NEXT STEPS

While classroom and assembly spaces assigned to the Registrar's Office roughly amount to only 4.5% of all academic space on the Evanston Campus ("710" buildings), this nonetheless is in the range of 100,000 net assignable square feet (nasf), an area comparable to the Material & Life Science Building. This is a significant resource targeted to one of the most essential missions of the University. With roughly 15,000 nasf of additional classroom space that can be brought on line over the course of the next few years, classroom space that currently exists will need to be understood, not only in terms of current rates of utilization, but in terms of the potential impact on utilization of these additional facilities. Any effort to understand this impact should be considered in the context of how existing classroom facilities could be modified and upgraded, including potential alternative uses of some existing classroom spaces. Particularly relevant will be options for providing Schools and Departments with additional space as their programmatic goals justify a trade-off between space used as classrooms versus space used to meet other programmatic needs. With the anticipated addition of classroom facilities, the question reasonably needs to be asked: can some portion (if not a comparable amount of space) be converted to alternative uses? As well, if opportunities present themselves for making better use of existing classroom spaces, for example, by decreasing the number of seats in a classroom to accommodate furnishings that allow for greater flexibility of use and better pedagogical methods, the question needs to be asked whether there may be ways to increase utilization even before all of the additional classrooms are completed and made available for scheduled courses. These potential opportunities may not be insignificant, even taking into account the demand to schedule classes during "prime time."

Hence, future evaluation of Evanston's classroom space should take into account the following:

- Anticipated increases in classroom space that will result from projects underway;
- Current rates and patterns of utilization, including seat utilization, and the way these rates and patterns could be impacted by these additional facilities;
- Extent to which existing and new facilities might be best utilized by increasing the number of courses slotted into standardized schedules;
- Pros/cons of alternative uses for some existing classroom spaces, especially in light of additional classrooms that will be made available on the Evanston

campus, where Schools and Departments have need of additional space to support their programmatic missions.

Current rates of utilization for the Winter, Spring and Fall terms during calendar year 2000 suggest that, overall during weekdays from 9 to 5, and particularly when classroom spaces currently under construction are taken into account, some reduction in the number of classrooms and hence increase in utilization could be accommodated. However, the concentration of courses offered between 10:00 to 3:00 (particularly courses offered at 11:00, when utilization on some days already approaches 100%) means that elimination of any particular classroom or combination of classrooms has to be considered on a case-by-case basis. This should take into account where and how courses might alternatively be scheduled, as well as the potential "ripple-effect" throughout the Registrar's scheduling of classes.

Further exploration of classroom availability in any particular building should minimally take into account the following:

- New classroom facilities on the Evanston campus could offer some opportunities for replacing existing classroom spaces that may be well located for other programmatic uses;
- Some courses more typically scheduled between 10:00 to 3:00 (particularly courses scheduled at 11:00 and 1:00) might alternatively be scheduled earlier and later in the day in order to maintain their current proximity to faculty offices and departmental locations;
- Dislocation of some courses to other classroom buildings, which in some instances could prove less
  convenient to faculty and students than current arrangements, may offer much needed space to promote other instructional and research programs that faculty and students otherwise find beneficial. For any particular location, the trade-offs need to be more clearly understood.

OVERVIEW OF UTILIZATION DATA FOR FALL, WINTER & SPRING QUARTERS

Below is a summary of information displayed in greater detail in the attached charts and spreadsheets. Efforts of the Utilization Subcommittee this year focused on development of utilization information for Spring and Fall Quarters, thus completing a "snap-shot" of classroom usage for an academic year under the supposition that one year may not dramatically differ from the next, and that patterns from Fall to Winter to Spring Quarter are likely to repeat in subsequent academic years. While utilization slightly decreases over the course of an academic year, more striking are the averages and patterns that are fairly consistent from one quarter to the next.

- **Daily Utilization for all Classrooms scheduled by Registrar:**
  (Fall Quarter 00-01; Winter Quarter 99-00; Spring Quarter 99-00)

Utilization based on rooms scheduled: in the range of 65% 9 to 5 daily; 54% 8 to 6 daily.
Utilization based on rooms scheduled 9 to 5 daily: Fall @ 66%; Winter @ 65%; Spring @ 63%.
Hence, utilization based on rooms scheduled is only somewhat higher during the Fall Quarter.
Fall Quarter: classrooms most heavily scheduled from 9 to 3, with utilization dropping between noon to 1.
Winter Quarter: most heavily scheduled from 10 to 3, with utilization dropping between noon to 1.
Spring Quarter: most heavily scheduled from 10 to noon, and 2 to 3.
For all three Quarters, classroom utilization at 10 and 11 exceeds targeted 75% rates of utilization.
Average usage at 11 for all three Quarters is extremely high (91%).

- **Daily Utilization for "Smart" Classrooms scheduled by Registrar: (Averages for Fall Quarter 00-01, Winter Quarter 99-00 & Spring Quarter 99-00)**

Utilization of "smart" classrooms scheduled: in the range of 72% 9 to 5 daily; 62% 8 to 6 daily.
Utilization higher compared to "non-smart" classrooms, which have rates of 64% 9 to 5 daily (53% 8 to 6).
While rates of utilization for "smart" classrooms are higher, patterns are similar to those for all classrooms.

- **Room Utilization by Building 9 to 5 daily: (Averages for Fall Quarter 00-01, Winter Quarter 99-00 & Spring Quarter 99-00)**

Buildings with the largest number of classrooms and largest number of adjacent programs (departmental
and faculty offices) tend to have the highest rates of utilization.
Tech (75%) and Kresge (74%) have highest rates of utilization.
University Library (45%), which consists primarily of classrooms with less than 20 seats, is lowest.

- **Based on Size of Room Scheduled: Up to 20 seats; 21 to 80 seats; 80 to 120 seats: (Averages for Fall Quarter 00-01, Winter Quarter 99-00 & Spring Quarter 99-00)**

  - Up to 20: 52% (smallest classrooms have lowest rates of utilization)
  - 21 to 80: 65%
  - 81 to 120: 62%

- **Seat Utilization based on the Size of Scheduled Classrooms: (Averages for Fall Quarter 00-01, Winter Quarter 99-00 & Spring Quarter 99-00)**

- Up to 20: 60.8% (smallest classrooms have highest seat utilization)
- 21 to 80: 46.6%*
- 81 to 120: 48.3%
- 120 and larger: 38.4%

*NOTE: As a check using data from the Fall Quarter, classrooms in the size range of 21 to 80 (seat util. @ 43.3%) were further subdivided into two ranges: 21 to 40 (seat util. @ 43.1%) and 41 to 80 (seat util. @ 44.3%). Based on this cursory analysis, seat utilization appears to be evenly distributed across the range of classrooms sized from 21 to 80. Also checked using data from the Fall Quarter, the frequency of seat utilization greater than or equal to 80% at the busiest hour of the day (11 to noon) was as follows:

21 to 40:	21.7% (18 instances out of 83)
41 to 80:	20.6% (13 instances out of 63)

For any classroom that might potentially be targeted for a decrease the number of seats, seat utilization specific to the classroom would need to be considered, along with options for shifting some scheduled courses into classrooms that would have a larger number of seats.

- **Standard/Non-Standard Course Scheduling:**
  (Averages for Fall Quarter 00-01, Winter Quarter 99-00 & Spring Quarter 99-00)

  Standard scheduling refers to: courses scheduled hourly on Mondays, Wednesdays and Fridays from 8 to noon and 1 to 5; or courses scheduled on Tuesday and Thursdays 9 to 10:30, 10:30 to noon, 1 to 2:30, and 2:30 to 4. Overlap into the noon hour or after 5 is considered standard. A variation of standard scheduling has courses scheduled 4 or 5 days weekly at the same time, which is a pattern for Science, Engineering, Mathematics and Language courses. Courses, which do not fall into any of these categories, are considered to be on non-standard schedules.

Courses on standard schedules:	38.7%	
Courses consistently scheduled 4 or 5 days weekly:	23.7%	
Courses on non-standard schedules:	22.3%	(excludes discussion/lab sections)
Discussion sections and lab sessions scheduled:	15.3%	
ALL COURSES & DISCUSSION/LAB SECTIONS	100.0%	

- **Prelim. Comparison & Ranking of WCAS Dept. Classrooms. vs. Registrar Classrooms:**
  Given limited information developed last year, departmentally scheduled seminar rooms and classrooms appear to have lower rates of utilization than classrooms scheduled through the Registrar.

PROPOSED SUBSEQUENT STEPS:

1. For classrooms scheduled through the Registrar, further develop workability of decreasing the number of seats in classrooms both to decrease congestion in existing spaces and, in particular instances, to explore conversion to flexible classroom configurations. (Note: a list of likely classrooms would need to be developed, including additional information specific to those classrooms and options for accommodating the somewhat larger classes that may now on occasions be scheduled into these spaces.)

2. Consider implications of new classroom spaces on current patterns of utilization, and determine whether at least some of these could substitute for classrooms that could be converted to alternative uses.

    a. On Evanston campus, classrooms which have been or will be added:

    - Block "Aud." Clssrm. 106 157 fixed seats (sloped; approx. 1,800 nasf) Block
    - Scott "Seminar" Clssrm. 212 30 seats (approx. 1,045 nasf) Pol. Sc.

    Note: Increased availability of Clssrm. 212 results from relocation of Career Services from Scott's 2nd floor, and relocation of current Pol. Sc. seminar functions from Clssrm. 212 into Rm. 201.

    - Anderson Clssrm. 1-1246 98 seats (tiered; approx. 1,450 nasf) KGSM
    - Anderson Clssrm. 2-2245 84 movable chairs (approx. 1,450 nasf) KGSM
    - Anderson "Seminar" Clssrm. 3-3245 50 fixed seats (tiered; approx. 930 nasf) Econ.
    - McCormick Trib. Bldg. "Forum" 1-101 154 fixed seats (tiered; approx. 3,300 nasf) Medill
    - McCormick Trib. Bldg. Clssrm. 3-119 46 fixed seats (tiered; approx. 1,050 nasf) IMC
    - McCormick Trib. Bldg. Clssrm. 3-127 46 fixed seats (tiered; approx. 1,050 nasf) IMC
    - Life Sc. Bldg. "Lecture" Clssrm. 1-101 125 movable (tiered; approx. 1,850 nasf) WCAS
    - Ford Design Center Clssrm. 65 seats (approx. 1,200 nasf) Eng.

    b. Additional classrooms are also being added on the Chicago campus.

3. For classrooms scheduled through the Registrar, further develop workability of converting some classrooms to alternative uses where programmatic demands from Schools and Departments may necessitate additional space; if particular classrooms were converted, consider where and how the course-load previously scheduled into these classrooms would be accommodated, and delineate the potential implications for scheduling across all classrooms scheduled through the Registrar.

a. Classroom buildings with future programmatic space need, and potential locations to target (average rates of utilization for three Quarters based on weekdays 9 to 5):

- Technological Institute (75%; 30 classrooms);
- Lunt (57%; 6 classrooms);
- Fisk (55%; 6 classrooms);
- Swift (64%; 2 classrooms).

b. Classroom buildings with programmatic space needs to be addressed through anticipated construction and relocations:

- Kresge (74%; 17 classrooms);
- Harris Hall (68%; 8 classrooms);
- Francis Searle (51%; 7 classrooms).

c. Other classroom buildings (average rates of utilization for three Quarters based on weekdays 9 to 5):

- University Library (45%; 13 classrooms);
- Annenberg Hall (58%; 8 classrooms);
- Parkes Hall (63%; 6 classrooms);
- University Hall (69%; 11 classrooms).

4. Implement general purpose scheduling guidelines, for example, similar to scheduling guidelines WCAS has had in use for roughly the past ten years (discourages non-standard scheduling), and/or based on a study currently being prepared through the Registrar's Office ("Scheduling Guidelines from Other Universities"). In conjunction with this, consider giving scheduling priority to courses (or combinations of courses) which conform to standard scheduling.

5. Further evaluate options by which departments might be encouraged to schedule courses more evenly over daily classroom time-slots and in spaces more closely aligned with anticipated enrollments, again, based on scheduling guidelines used at other universities.

a. Of all courses offered by any department, courses scheduled during a particular time-slot could not exceed a calculated percentage (an approach to help relieve the severe crunch particularly at 11:00).

b. Any course offered should not be scheduled for more than some percentage (for example, at more than 110%) of its previous enrollment.

6. Further review use of classroom spaces scheduled through Schools and Departments.

c. All Schools should report to the Registrar scheduled times of classes in departmentally scheduled rooms (WCAS is already doing this).

d. Explore workability of scheduling more courses into departmentally scheduled classrooms (WCAS is already doing this).

e. As Library seminar rooms are upgraded (currently, the lowest utilization rates of classroom spaces), consider whether this can be accompanied by some decrease in the number of departmentally scheduled seminar rooms.

f. Develop “incentives” for reducing the number of departmentally scheduled classrooms (ways by which a larger number of departmentally scheduled classrooms might be offered to Registrar to schedule, or converted to alternative uses).

Appendix III.A.

See attached electronic files:

- "Classrm Comm Fall 2000 Sort by Room Size2'1.xls"
- "Classrm Comm Summary (Tech, Kresge, Harris)21.xls"
- "Classrm Comm Summary All (Winter.Spring.Fall.2000)21.xls"
- "Classrm Comm Summary Scheduling Type (Winter.Spring.Fall.2000)1.xls
- "Classrm Comm Summary Smart (Winter.Spring.Fall.2000)21.xls"