The Center for Allied Health Programs (CAHP) University of Minnesota Status Report July 2010

Barbara Brandt, PhD., Associate Vice President for Education, Academic Health Center Cindee Quake-Rapp, Ph.D., Director, Center for Allied Health Programs
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Introduction

In July 2006, the University of Minnesota’s Board of Regents established the Center for Allied Health Programs as a new model “to increase workforce production in a financially sustainable model; coordinate . . . with the Minnesota State Colleges and University (MnSCU) system to avoid duplication and more efficiently deploy resources; collaborate with private health systems and leaders to educate for current and specialized skills; and produce the next generation of allied health professions researchers and faculty members.”¹ The principles that created this new model were: quality, non-traditional models of delivery (hybrid education), agile, financially sustainable, incorporating many sectors, learner-and stakeholder-center, future-oriented, leveraging technology and talent, statewide access and outcomes-monitoring. The proposed features in 2006 were: Twin Cities and Rochester performance sites; academic partnerships; technology learning platform; learning objects repository; interface with other higher education institutions; and support to faculty to create a new online and hybrid curriculum.

Two programs, medical technology (now called clinical laboratory science) and occupational therapy were moved from the Medical School into the newly created Center. The Program in Occupational Therapy is the only public masters-level program in Minnesota. The Clinical Laboratory Science program is currently the only accredited degree-granting program in the state. Fairview Health Systems, Hennepin County Medical Center, and Mayo Health System have accredited certificate programs that coordinate with other universities to grant a degree. This status report provides a four-year update of the Center’s progress toward reaching the vision and goals and presents plans for the future. (For a timeline of CAHP Development Timeline, refer to Appendix A.)

Development and Delivery of a New Professional Curriculum Model

Integrated Curriculum. CAHP faculty partnered with an AHC Office of Education instructional design team to redesign the curriculum, how they teach, and ultimately how students learn. In doing so, faculty have created a clearly and logically integrated curriculum designed to achieve professional competencies rather than offering a collection of independent courses. The faculty and design team created a standardized curriculum and course design across both programs. They began with an analysis and identification of professional competencies needed in current practice settings, stated in measurable terms. Learners must be able to demonstrate these competencies by completion of the unit of instructions: a skills laboratory, module, course, or even the entire curriculum. Multiple opportunities to assess learner progress and program evaluation are built into the entire program.

¹ Center for Allied Health Programs. Proposal to the University of Minnesota Board of Regents, July 12, 2006. Presented by Frank B. Cerra, M.D. and Barbara F. Brandt.
**Blended Learning.** To address workforce shortages while increasing access beyond the campus, the two CAHP programs, the Masters in Occupational Therapy (OT) and Bachelor of Science in Clinical Laboratory Sciences (CLS), have developed innovative methods to educate future professionals using the latest teaching and learning technologies: on-line laboratory simulations, face to face clinical skills assessment, and continuing education modules. Learning technology platforms extend the programs to students no matter where they are or when they can access learning.

All courses in CAHP programs now include an online or blended/hybrid component (Appendix B: Status of Blended Model Implementation.) The implementation work is ongoing. For example, all courses are moving toward online lectures and adopting a new and more reliable emerging technology provided by the University called UMConnect (Adobe Connect). Courses can be delivered “live” from a host location to multiple sites around the world or recorded and viewed anytime at a student’s convenience.

**Leveraging University Learning Technologies.** The CAHP faculty leveraged the University’s comprehensive, enterprise-wide academic technology solutions by piloting and testing various educational delivery methods. The implementation of blended and/or hybrid curriculum in our academic programs benefited from the essential support provided by the Academic Health Center Office of Education and the University’s Office of the Vice Provost for Distributed Education and Instructional Technology. Access to course management systems such as WebVista/Blackboard and Moodle, real-time Web-conferencing and lecture capture software, and online evaluation and survey software that are centrally provided and administered have been key to the success of our allied health programs. All students use the University’s customized My U portal providing them with easy, secure access to a comprehensive collection of University resources and virtual collaboration sites. The University Libraries have also served to provide indispensable resources including e-reserve management, investment in online books and resources, and consultation on copyright and use of online subscription-based materials.

**Active Learner Engagement.** Student learning and expectations for faculty engagement have transformed in CAHP. The Center’s curricular design requires that students be responsible for their own learning – rather than passively listening to lectures as their main source of education. Now, students come to the less frequent face-to-face sessions on campus having completed readings, prepared to interact with others, capable of reflecting on faculty questions, and with a readiness to apply basic concepts. Through blended learning, students work in small, virtual groups, contributing to staged questions in discussion boards and summarizing their own group’s work as they take turns in the role of ‘spokesperson.’ A student-to-student “CLS Cafe” and “OT Cafe” were created as private discussion rooms within the Moodle course management system. These private 24-7 discussion forums have enabled students to create learning and social communications across campuses and across cohorts in the specific programs.²

**Two Performance Sites: Twin Cities and Rochester.** As proposed in the 2006 proposal, CAHP established performance sites at both the Twin Cities and Rochester campuses. Previously, the CLS

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program had been simultaneously teaching the laboratory classes on the Twin Cities campus in several smaller laboratory classrooms shared with other programs such as medical education. None of these classrooms were large enough to accommodate all of the CLS students at the same time. This inefficient situation resulted in the need for additional teaching specialists in order to maintain safety standards for students while having identical laboratory exercise occurring in multiple student laboratories. Additionally, faculty had to set up and take down sensitive equipment each time a laboratory teaching session was held. The classrooms also lacked sufficient technology (i.e., computers with wireless access) to support the instructional redesign. To correct this situation, two new teaching laboratories with interactive television (ITV) and new computer technologies were built on both the Twin Cities and Rochester campuses.

The Twin Cities and Rochester campuses include state-of-the-art, fully equipped, dedicated laboratory teaching space. Students have access to some of the same automated instruments that are currently used in health systems clinical laboratories. ITV facilitates synchronization between the two sites for teaching. The Rochester teaching laboratory has eight hexagonal tables to facilitate peer-to-peer interaction. Each table holds three monitors (one for every two students), so Rochester students are able to view demonstrations as if they were seated next to the instructor on the Twin Cities campus or information can be transmitted from the Rochester lab to the TC. Students from both campuses can interact with the instructor and one another in discussions, presentations, and teachable moments as they occur within the laboratory exercise. The instructor can project such features as microscopic images, culture plates from the microbiology laboratory, the physical characteristics of a urine specimen, or a chemical reaction as it occurs in the test tube. Demonstrations and practical examinations formerly taught using individual microscopes are now projected for the entire class in two locations, greatly increasing efficiencies and effectiveness.

The OT program also has dedicated classrooms in both Twin Cities and Rochester using the same ITV format where demonstrations of evaluations and therapy techniques can be viewed and exchanged between performance sites.

**Description of Academic Partnerships**

In December 2008, Frank B. Cerra, M.D., Senior Vice President for Health Sciences; Stephen Lehmkuhle, Ph.D., Chancellor, University of Minnesota-Rochester; Judith Ramaley, Ph.D., President, Winona State University; and Charles Christiansen, Ph.D., then CAHP Director, signed an agreement to collaborate on developing allied health programs. Since that time, the CAHP has signed affiliation agreements between
Winona State University, Mankato State University, St. Cloud State University and the University of Minnesota Academic Health Center. The purpose of the agreements is to allow qualified WSU, MSU, and SCSU students who wish to pursue a program of study leading to a Bachelor of Science degree in Medical Technology or Clinical Laboratory Sciences, the opportunity to participate in educational experiences at University of Minnesota campuses in the Twin Cities or Rochester. Students complete their prerequisite courses at their home institution. They then take their professional CLS courses at the University of Minnesota. Their home campus grants their degree in Medical Technology/Clinical Laboratory Sciences.

Cindee Quake-Rapp, Ph.D., the CAHP Director, is a member of the University of Minnesota and Mayo Clinic Education Collaboration Committee, which establishes approved guidelines for collaborative educational partnerships with the Mayo School of Health Sciences. The first proposal to be approved through this committee was to incorporate Mayo Clinic OT clinicians as guest or joint lecturers in the UMN-OT program June, 2009.

Progress Toward a New Academic Administrative Model

New Academic Culture. The two CAHP programs, while both in the Medical School previously, were in two different departments, and the faculty had never worked with each other. Therefore, the Center development necessitated the creation of a new “school” by bylaws, faculty governance, new “7.12” promotion and tenure guidelines, faculty and staff performance reviews, and essentially an entirely new academic culture. This new culture includes the creation of new traditions in the form of a single graduation of the first class to complete the blended programs in December 2009. As the two programs were centralized under the Center administration, work flow, faculty development, student services, and technical support have also begun to be shared between programs. As a result, CAHP has been able to efficiently provide shared services such as Workforce Investment Act (WIA) certification, consultation for a design of virtual student services, and Quality Matters certification training (a national quality assurance process for development and teaching of online and blended courses), to faculty across the Center².

Accreditation. The Accreditation Council of Occupational Therapy Education (ACOTE) reviewed the Rochester performance site on September 18 and 19, 2008 as part of an "Application for Accreditation of an Additional Location" site visit. The following strengths of the program were identified; "The administrators are visionary in their ability to conceptualize and champion strategies for delivering occupational therapy education and meet 21st century workforce needs of the citizens of Minnesota. Administrators from the University of Minnesota, the Rochester campus, and the Center for Allied Health Programs have articulated a high level of confidence in the occupational therapy program, and its potential to be a model for other academic units in the University." The students have embraced the cutting edge technology used to deliver the program and are engaged in a collaborative learning process with the occupational therapy faculty. They are highly motivated, active participants in their learning."

The program in Occupational Therapy is in the midst of a self-study with an accreditation site visit scheduled by the Accreditation Council for Occupational Therapy Education (ACOTE) in October, 2010.

A final report of the 2009 accreditation site visit for the CLS program by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) was completed on April 21, 2009. The site visitors listed strengths of the program as the "dedicated faculty who worked diligently to implement the curriculum using a new model of delivery; the effective and innovative use of technology; the responsiveness of the
University and the Program to workforce needs throughout the State of Minnesota through programmatic growth and incorporation of additional affiliates; and the significant resource investment by the University to renovate teaching laboratories at two distant sites (Minneapolis and Rochester)."

**Enrollment**

Increasing enrollments to address Minnesota’s workforce needs has been a primary goal for the CAHP. The Occupational Therapy program has doubled its enrollment, and CLS has nearly tripled. Both the programs in Occupational Therapy and Clinical Laboratory Sciences are experiencing positive trends in interest in the programs, applications, and enrollment, both in the Twin Cities and UMR.

<table>
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<tr>
<th>Year of Cohort Matriculation</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2012 Projected</th>
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<td>77</td>
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<td>Number of Students in Cohort</td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<td>NA</td>
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<td>Number of Cohort that Graduated *</td>
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<tr>
<td>Total</td>
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<td>22</td>
<td>31</td>
<td>37</td>
<td>43 **</td>
<td>NA</td>
<td>47 **</td>
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</table>

* Most students in occupational therapy graduate two years after matriculation

** Projected

Student attrition within the occupational therapy curriculum represents students who did not meet minimum academic performance for at least one semester. Whenever possible these students were readmitted into a cohort the following year. At this point, these students continue in the Program.
Program in Clinical Laboratory Sciences

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2012</th>
<th>Projected</th>
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<tr>
<td>Number of applicants</td>
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<td>141</td>
<td>130</td>
<td>160</td>
<td>188</td>
<td>217</td>
<td>275</td>
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</tr>
<tr>
<td>Total Enrollment*</td>
<td>67</td>
<td>73</td>
<td>66</td>
<td>87</td>
<td>112</td>
<td>185</td>
<td>218</td>
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</tr>
<tr>
<td>Number of Students in Senior Cohort**</td>
<td>TC UMR Total</td>
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<td>37</td>
<td>38</td>
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<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Number of Cohort that graduated</td>
<td>35</td>
<td>31</td>
<td>36</td>
<td>46</td>
<td>64***</td>
<td>65***</td>
<td>87***</td>
<td></td>
</tr>
</tbody>
</table>

*Total Enrollment includes seniors on clinical rotations, seniors in didactic courses, and early admission juniors.

**For CLS Program, a cohort is defined as the number of students starting the professional curriculum at the beginning of the senior year. Most CLS students graduate 16 months after beginning their senior year.

***Projected

Student attrition within the CLS program includes students who did not meet minimum academic performance for at least one semester and students who withdrew from the program for health or personal reasons, including admission to dental and pharmacy school. Between 48-56% of the students in the Clinical Laboratory Sciences cohorts for each of these years have English as a second language (ESL). For this reason, many have struggled in taking a full load of science courses for the two semesters of the senior year. Preliminary data suggests the conversion of the program to a hybrid curriculum is helping these students gain a better understanding of the material, in that attrition has gone down, even though enrollment has doubled. The ES students have stated they find it very helpful to be able to re-listen to portions of lectures and review online modules that explain difficult concepts. They can learn at their own pace rather than depending only on one time classroom presentations.

Outcomes

**Rural Clinical Rotations:** The CAHP has made significant progress in expanding the locations of clinical rotations into more rural, underserved areas. Prior to the creation of the CAHP, the vast majority of clinical rotations occurred in the Twin Cities metropolitan area. The number of CLS clinical affiliates has increased from 22 in 2005 to 48 in 2010. Approximately 60% of these affiliates are located in rural and micropolitan Minnesota. Sites that have been added in the past two years are located in Bemidji, Hibbing, Willmar, Marshall, St. Croix Falls, Fergus Falls, Osceola, Owatonna, Red Wing, and Buffalo. The number of OT clinical affiliates has increased from 198 in 2005 to over 300 in 2010. The program in occupational therapy has added 30 rural clinical affiliate sites since implementation of the blended/hybrid curriculum in 2007. As of April 2010, 49% of the most current clinical placements were in non-metropolitan areas. Sites that have been added in the past two years are located in Chaska, Mankato, Lake City, Whitewater, Winona, and St. Cloud.
To further the CAHP’s strategic goal of continuing growth of placements for clinical rotations in rural Minnesota, OT students (beginning with those admitted to the program in the Fall, 2010) are now required to complete one of two full-time, three month internships in a rural setting, in collaboration with Minnesota Area Health Education Centers (AHEC) located in Northwest, Southern, Central, and Northeast, MN. AHECs assist with student training in areas that demonstrate health profession shortages and a high population of medically underserved

Employment Outcomes. The Minnesota Department of Employment and Economic Development currently ranks occupational therapists as 44th, and clinical laboratory scientists as 103rd out of 333 total occupations “most in demand” in the state of Minnesota. From 2008 to the present, the recession has had a significant impact on short term hiring practices of clinical laboratory scientists, particularly in decreasing CLS available positions in the Twin Cities metropolitan area. Shortages still exist in rural and micropolitan Minnesota and nationally with the expectation of shortages in the future. Institution of the hybrid curriculum, expansion of the programs to UMR, and moving more clinical rotations to rural locations are all designed to create more opportunities for students to be placed in rural settings, and to attract students more inclined to seek employment in such settings. Thus, recent implementation of these changes to the programs through establishment of the CAHP makes measurement of their effect on employment statistics premature; the first class to graduate under the new program model only occurred in December 2009.

Of the 2005-2009 graduates, 93.4% obtained employment in Minnesota. Prior to the economic downturn in late 2008, all CLS students had job offers before they graduated. Currently, 72% of the CLS have jobs within 6 months. In the short run, trends are moving away from employment in hospitals (from 90% in 2005 to 55% in 2009), and towards “affiliate” jobs, such as biotechnology firms, research, and other private industry. Approximately 5% of the 2008/2009 graduates were admitted into another professional program such as pharmacy, medical school, or graduate school.

However, the recession is having less of an impact on occupational therapy; most students are offered employment prior to graduation. The available information indicates that an increasing percentage of OT graduates are accepting employment in rural and micropolitan Minnesota. At the time of this report, 11 (of 36) students from the June, 2010 graduating class have responded to a poll about their employment status: nine secured employment in Minnesota, four of them in non-metropolitan settings (Le Sueur, Waconia, Duluth, and Mankato). Data also were obtained from 32 students who graduated in 2009: 20 obtained employment in Minnesota, four of them in Mankato and Rochester. Eight of the remaining twelve are employed in Western, rural Wisconsin. In contrast, of the 22 graduates of the 2008 cohort who did not participate in the CAHP educational model, no students obtained employment in rural areas.

The OT program opened its UMR program one year ahead of CLS and developed its hybrid curriculum more quickly; therefore, the limited information showing increased rural OT placements provides some evidence that steps taken by the CAHP will ultimately address the rural workforce shortage in both OT and CLS by placing more graduates in underserved areas of Minnesota.

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Performance on National Boards. The first occupational therapy students to graduate under the new blended/hybrid curriculum passed the national certification examination at a rate 10% higher (92%) than the national average (83%)

Workforce Diversity. As an undergraduate healthcare profession, CLS has become a gateway for the immigrant population to enter the healthcare workforce. For the past five years, approximately 50% of the students enrolled in the CLS Program are students of color, primarily foreign-born permanent Minnesota residents. As an undergraduate program, the Clinical Laboratory Sciences Program has been able to provide an entry point for this population into the healthcare professions, thus increasing diversity.

Student Perception of Blended/Hybrid Courses. The Academic Health Center Office of Education conducted a survey of the first class of CLS graduates who experienced the new blended curriculum; 83% of the respondents found the online lectures very useful, and 17% found them fairly useful; 96% found the online pre-lab exercises to be useful, while 4% did not find them to be useful. Students stated that they preferred a blended learning approach with a combination of face-to-face, video conferencing, and online delivery. However, when given a choice of attending classroom, face-to-face lectures or viewing them online, only 25% attended the classroom option.

The first class of OT students under the new blended curriculum survey rated fall 2009 courses with a mean rating of 4.2/5.0 for the item, “What I learned will help me become a competent occupational therapist.” These scores indicate overall student satisfaction. Focus group data indicate that students like the flexibility afforded to them by the blended learning curriculum. They value both the in-person and online learning activities. The use of interactive video connections between locations has been less well-received by students leading the program to explore alternative ways of bringing students together while spanning a distance through Web-based technologies.

Faculty Accomplishments. Appendix C provides a brief outline of faculty accomplishments related to the development of the hybrid curriculum.

Next Steps

The CAHP is focused on continuing to advance the OT and CLS programs towards providing the graduates necessary to serve the needs of Minnesota and, in particular, underserved areas and populations within the state. To that end, it is focused on continuing the work of increasing the number of students enrolled in CAHP programs, growing the hybrid programs, expanding the UMR programs, increasing clinical rotations in underserved areas, and especially in improving placement of graduates in these areas. To that end, as noted, work is being done with the MNSCU system to recruit students into our programs from rural schools.

In developing a financially sustainable model for CAHP, both programs are looking to continuing education for marketing of learning materials. The innovative nature of the model as developed by the programs is evidenced by the fact that other higher educational institutions, the American Red Cross and other national organizations have requested access to the materials created under the CAHP. The American Red Cross has asked the CLS program to develop a blood banking module that will be distributed globally. A clinical laboratory sciences faculty developed a simulated on-line hemostasis laboratory in which students perform simulated testing on “patient samples” and turn in test results online, replacing the need for wet laboratory exercises. This has resulted in cost-savings by eliminating the
need for expensive laboratory equipment, reagents, and teaching specialists to staff the student laboratories. This online laboratory will be marketed to over 200 laboratory educational programs using a learning object repository (Equella), which will provide CAHP faculty the opportunity to store learning objects that can be selectively shared or marketed to other institutions. The hemostatis lab will be the first module to be marketed in August, 2010.

Both the CAHP director and CLS program director have been meeting regularly with the Allina Health Care System and MnSCU partners to develop a statewide system of shared resources and courses as part of a Department of Labor grant. This included the CLS director as part of a delegation sent to the Michener Institute in Toronto to evaluate the possibility of a simulated laboratory experience in order to decrease the amount of time students would spend on their clinical rotations, in order to alleviate the shortage of available clinical sites. An outcome of this collaboration is financial support from the Department of Labor grant in developing a statewide competency-based “model curriculum” for laboratory technicians and CLS professionals supported by Dr. David DeGroot, Dean of the College of Science and Engineering at St. Cloud State University and Dr. William McBreen, Dean of the College of Nursing and Health Sciences at Winona State University.

In addition, the CAHP is looking to address the needs of underserved populations in healthcare professions other than OT and CLS. For example, the CAHP is developing a proposed statewide and national online degree completion for career advancement for allied health professionals (adult learners) with associate degrees already in the workforce. The Center has conducted a needs assessment and focus groups to determine the needs of Mayo Clinic employees regarding career advancement. The Center has also been approached to conduct the same assessment with the Fairview Hospital System to explore degree completion pathways for their Radiation Therapy and imaging programs. This proposal is also intended to provide a quality pathway toward graduate education that could produce a pipeline for future educators of allied health professionals, an area of significant shortage.

Conclusion

The Center for Allied Health has made substantial progress in achieving the vision and goals set forth by the University administration when it established the Center in 2006 to develop strategies for delivering a new educational model to meet 21st century allied health workforce needs of the citizens of Minnesota. In the last 4 years, the CAHP has implemented a new hybrid curriculum model, leveraged resources through use of University teaching technologies and partnerships with industry and academic institutions, expanded and improved facilities and enrollment at both the Minneapolis and Rochester campuses, expanded clinical rotations to rural areas of the state, and have moved the CAHP toward an efficient and financially sustainable model to produce the next generation of allied health workers.
Appendix A - Timeline

2002
Medical School appoints Budget and Finance Task Force

2004
Medical School Budget and Finance Task Force recommends closing one or more allied health care programs, including Medical Technology (MT) and Occupational Therapy (OT)
Medical School Dean requests that OT program stop admitting students for the following year

2005
Senior Vice President for Health Sciences appoints Allied Health Education Models Task Force to develop new, financially sustainable model for allied health education

Allied Health Education Models Task Force recommendations include two sites, Twin Cities and Rochester, and a strengthening of public and private partnerships in allied health across the state

Senior Vice President for Health Sciences charges advisory Steering Committee to develop and design administrative oversight for Center for Allied Health Programs (CAHP), based on task force principles; Dr. Barbara Brandt charged with developing the Center

2006
External reviews conducted for both OT and MT programs to establish benchmarks for future performance; each review articulated significant recommendations for the programs

Board of Regents approves the new Center for Allied Health Programs in July and the CAHP opens in September

The Division of Medical Technology becomes the Clinical Laboratory Sciences Program

Board of Regents approves a new professional degree in occupational therapy, Master of Occupational Therapy degree

Facilities upgraded at UMR including specialized laboratories for CLS and OT

2007
First class of occupational therapy students admitted in new hybrid program
CLS facilities are upgraded on Twin Cities campus
Rochester performance sites open

2008
First class of CLS students admitted in new hybrid program

2009
First class of Occupational Therapy and Clinical Laboratory Sciences graduates
## Appendix B – Development of CAHP Online Learning Components
### Percentage of CAHP Professional Courses Available Online

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<th>Course</th>
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<th>% Online</th>
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<tbody>
<tr>
<td>OT 6100 Public and Professional Engagement</td>
<td>33%</td>
<td>CLSP 4101 Mycology, Parasitology, and Virology</td>
<td>90%</td>
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<td>OT 6101 Foundation of Occupational Science and Occupational Therapy</td>
<td>95%</td>
<td>CLSP 4102 Diagnostic Microbiology Lecture</td>
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<td>77%</td>
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<td>OT 7201 Scholarly Inquiry in Health Sciences</td>
<td>87.5%</td>
<td>CLSP 4402 Molecular Diagnostics</td>
<td>20%</td>
</tr>
<tr>
<td>OT 6301 Neuroscience</td>
<td>48%</td>
<td>CLSP 4501 Introduction to Transfusion Medicine Lecture</td>
<td>30%</td>
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<tr>
<td>OT 6302 OT Process for Individuals: Occupation through Remediation</td>
<td>62%</td>
<td>CLSP 4502 Introduction to Transfusion Medicine Laboratory</td>
<td>15%</td>
</tr>
<tr>
<td>OT 6312 OT Process for Individuals: Occupation through Psychosocial Approaches</td>
<td>53%</td>
<td>CLSP 4601W Introduction to Laboratory Management and Professional Issues</td>
<td>40%</td>
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<tr>
<td>OT 6322 OT Process for Individuals: Work Context</td>
<td>67%</td>
<td>CLSP 4602 Education and Professional Issues</td>
<td>60%</td>
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<tr>
<td>OT 7394 Scholarly Project in OT</td>
<td>About 94%</td>
<td>CLSP 4701 Applied Diagnostic Microbiology</td>
<td>10%</td>
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<td>OT 6403 Management of OT Services</td>
<td>66%</td>
<td>CLSP 4702 Applied Hematology</td>
<td>10%</td>
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<td>OT 6422 OT Process: Group Context</td>
<td>77%</td>
<td>CLSP 4703 Applied Clinical Chemistry</td>
<td>10%</td>
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<tr>
<td>OT 6432 OT Process for</td>
<td>20%</td>
<td>CLSP 4704 Applied Transfusion</td>
<td>10%</td>
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</tbody>
</table>
CLS Modules

1. Hemostasis modules – a series of five simulated laboratory sessions describing the principles of the laboratory tests performed to assess blood clotting. These exercises allow students to view what occurs in the instruments they will be using in the actual clinical laboratory, download their “patient” worksheet, and perform the testing on controls, normal, and abnormal patient samples.

   http://dlgdev.sph.umn.edu/test/cls_demo/CLS_PTRab.html
   http://dlgdev.sph.umn.edu/test/cls_demo/CLS_TTlab.html
   http://dlgdev.sph.umn.edu/test/cls_demo/CLS_APTT.html
   http://dlgdev.sph.umn.edu/test/cls_demo/CLS_APTTInhibitor.html
   http://dlgdev.sph.umn.edu/test/cls_demo/CLS_FactorV.html

2. Clinical Chemistry Modules – a series of modules designed to teach students the principles and proper use of the equipment, techniques, and tests performed in the clinical chemistry laboratory.

   http://dlg.sph.umn.edu/test/cls_demo/LabCalculations.html
   http://dlg.sph.umn.edu/test/cls_demo/Glassware.html
   http://dlg.sph.umn.edu/test/cls_demo/Pipets.html
   http://dlg.sph.umn.edu/test/cls_demo/Spectrophotometry.html
   http://dlg.sph.umn.edu/test/cls_demo/Microscopy.html
   http://dlg.sph.umn.edu/test/cls_demo/UAMicroscopy.html
   http://dlg.sph.umn.edu/test/cls_demo/UrinalysisPending.html

The occupational therapy courses are available to enrolled students through the University’s content management system.
Appendix C- Faculty and CAHP Accomplishments

- CAHP is working with the Center for Transforming Student Services Evaluation Team (CENTSS) by way of a pilot project, evaluating how to use the CENTSS methodology to improve delivery of student services to online and hybrid learners. This methodology will be used to develop a CAHP Virtual Student Services Center.

- Drs. Nicole Zitterkopf and Stephen Wiesner collaborated with Winona State University to obtain an iSEEK grant to develop a digital library of microscopic slides that can be viewed on-line anywhere, with out the need for a microscope. The broader impact of this technology is to implement and evaluate virtual microscopy in undergraduate teaching, to inform new and existing laboratory science programs as they consider transition to a distributed learning environment. This digital library will be used to teach hematology and microbiology to CLS students across the state.

- Dr. Nicole Zitterkopf was awarded a fellowship by an Office of Instructional Technology to develop a hybrid microbiology course, which is intended to be utilized by Health Science students at UMR, as well as students from Minnesota State Colleges and Universities (MnSCU).

- Occupational Therapy program faculty Dr. Patricia Schaber has been recognized by the Academic Health Center (AHC) Academy for Excellence in the Scholarship of Teaching and Learning in 2009. She has been an advocate for the CAHP learning platform using online and technology enhanced tools for teaching and learning.

- Four occupational therapy faculty had presentations accepted at the 15th Congress of the World Federation of Occupational Therapists in Santiago, Chile (May 2010) out of 2000 submissions from around the world. Two presentations were on distance learning and technology.