Polytechnic Concept Steering Committee

Final Report
April 5, 2006
Introduction

In December of 2005, Chancellor Sorensen established the Polytechnic Concept Steering Committee to examine the potential for the University of Wisconsin-Stout to be designated as a polytechnic University. The committee was charged with the following duties:

1. **Information**: Gather information on schools nationwide that have a polytechnic, technology, institute of technology or technological designation.
2. **Analysis**: Review and analyze the information with attention to size of college or university, educational philosophy of education, distribution of programs, distribution of students within the college or university, relationship to the private sector, K-12 or state and federal agencies, technology parks or incubation centers, or other relevant information.
3. **Visitations**: Recommendations on sending small teams to visit such universities or invite visitors to UW-Stout to discuss the designation.
4. **Develop a plan** to share with the campus for an open dialogue on the issue.
5. **Make recommendations** to Governance and/or the Chancellor.

Recommendations were asked to be given to the chancellor and governance bodies by mid to late March 2006. The first meeting of the Steering Committee was held on January 19th, 2006 and the committee met eight times within the ten week period provided.

The Steering Committee was comprised of representatives from across campus. The following individuals served as committee members:

**Chair**: Forrest Schultz  
**School of Education**:  
(1) Hector Cruz  
(2) Howard Lee  

**College of Arts and Sciences**:  
(1) Laura McCullough  
(2) Diane Christie  

**College of Human Development**:  
(1) Susan Wolfgram  
(2) Kathleen Deery  

**College of Technology, Engineering and Management**:  
(1) Scott Springer  
(2) Don Olson  

**Student Services**:  
(1) LaMont Meinen  

**Stout Student Association**:  
(1) Adam Duffenbach  

**Faculty Senate**:  
(1) Kirk Mauldin  

**Senate of Academic Staff**:  
(1) Heidi Gilbertson-Gansberg
Data Collection

The initial work of the Steering Committee focused on identifying other institutions within the United States that fit within the framework of a polytechnic institution. Foreign educational institutions were eliminated from this list as a preliminary search of schools found them to be widely varied and not consistent with the scope of U.S. polytechnic universities. A subgroup of the committee was formed to identify as many polytechnic schools as possible in the U.S., using a broad definition to gather as much information as possible. This included all schools that had the title of Polytechnic, Institute of Technology, Technology, or in some other way identified themselves as a technical institution. In the initial phase, both four-year and two-year institutions were identified. The list was then shared with the entire Steering Committee for comments and additions. In total, 67 institutions were identified on the original list of polytechnic and technical designation institutions throughout the U.S.

The committee unanimously agreed to remove two year institutions from the list of polytechnic institutions to be examined, as they differed considerably from four year institutions and did not offer an equitable comparison to UW-Stout. This reduced the list of comparative universities to 35. The committee then identified characteristics that they felt were representative of the school, and would serve to identify similarities and differences among the universities. The following key characteristics were included:

- Size of Institution (number of undergraduate and graduate students)
- Classification (university, tech college or specialty school)
- Program Array and distribution of students
- Private or Public Institution
- Expenditure per student
- Amount of Public Funding Per Student
- Student to Teacher Ratio
- Selectivity of Freshmen Admission (percentage admitted, ACT/SAT scores)
- Demographics (race/ethnicity)
- High school class rank
- Regional, State, National Draw (% out of State students)
- Cost per year
- Mission statement
- Year the university was founded
- Year the university became a Polytechnic Institution

A matrix was then assembled that listed each of the 35 universities and the characteristics of interest (see Matrix Spreadsheet).

Information about institutions was gathered from multiple sources. The primary sources of data collection was from Collegeboard.com, Petersons.com, A2Zcolleges.com and individual university websites and where necessary by contacting administrative personnel at various universities.

The committee also met with a representative of CalPoly San Luis Obispo. On March 20, 2006 Professor Tina Bailey met with a variety of campus groups that included a dedicated meeting for the Polytechnic Concept Steering Committee. The committee assembled a series of 10 questions for Dr. Bailey (see Appendix C).
The session was recorded and is available as a podcast at the following urls:

http://www.uwstout.edu/lts/multimedia/Site/Podcast/podcast.html
http://www.uwstout.edu/lts/multimedia/streams/schultzf/cal_poly_discussion.wvx

Analysis

Using the assembled matrix, the Steering Committee compared all 35 universities to each other as well as to UW-Stout on the identified variables. Due to widespread similarity among schools in terms of mission statements and selectivity of freshman admission (based on SAT/ACT test scores), the committee chose to limit further comparison to only those schools specifically designated as Polytechnic Universities. This reduced the list of 35 universities to 7. These are listed at the top of the matrix. A comparison was then made among the 7 polytechnic universities and UW-Stout. As needed, the committee referred back to individual institution websites for clarification or supplemental information.

A number of trends were noted among the polytechnic universities across the country. Perhaps the most obvious similarity was an emphasis on science, technology, engineering, and mathematic (STEM) programs. In particular, Engineering, Business/Marketing, and Information Sciences also showed higher enrollments at the polytechnic universities than other universities on the matrix (see Appendix A for recent program data for UW-Stout).

A second notable distinction between polytechnic universities and other schools was the class rank of incoming freshman. The number of accepted students who ranked in the top 25% of their high school graduating class ranged from 56% - 95%, with a median rate of 77%. The selectivity of students accepted varied widely among polytechnic schools, ranging from 17% - 85% with a median level of acceptance of 61%. Thus, polytechnic universities on average accepted 61% of qualified applicants. Five were public universities, and two were privately funded.

The polytechnic universities were shown to have an emphasis on undergraduate education that includes hands-on, experiential learning opportunities within the undergraduate curriculum (e.g. a higher number of lab courses and practicum/internship requirements). Interactions between the polytechnic universities and industry also appeared to be quite strong. This was evidenced by information obtained from mission statements and individual university websites.

Other characteristics that were examined included the size of the institution, student demographics (primarily race/ethnicity), admission requirements, and length of time since becoming a polytechnic institution. Information was either incomplete or widely varied so that no specific pattern among these variables could be identified.

One additional area of consideration was the level of extramural funding at polytechnic institution. The Steering Committee was unable to readily obtain the information on all comparative institutions, but felt that the issue was important enough to merit at least a partial analysis. Thus, a brief comparison was made among four institutions. Funding at each school was primarily based upon the array of program offerings, and did not appear to be influenced by the polytechnic designation (see Appendix B).
Summary and Recommendations

Based on the Steering Committee’s analysis, it appears that UW-Stout shares certain characteristics with existing polytechnic universities. In particular, UW-Stout’s mission of “hands-on minds-on learning” closely resembles the mission statements of polytechnic schools, and is further evidenced by an emphasis on laboratory courses and experiential learning requirements across degree programs. Additional, UW-Stout maintains strong ties with local business and industry, which corresponds to relationships reported by the comparison universities.

Conversely, UW-Stout is unlike current polytechnic universities in comparison to other key characteristics. Degree arrays at polytechnic universities have a greater emphasis on programs in science, technology, engineering and mathematics than at the University of Wisconsin-Stout. In addition, the selectivity of UW-Stout is lower than polytechnic universities, based on class rank of incoming freshman and overall acceptance rate of college applicants.

The committee also acknowledges that the information provided in this report is limited as a result of difficulty in obtaining comprehensive comparison data, the complexity of defining characteristics, and time constraints associated with the committee’s charge. The potential inaccuracy of statistics obtained from public websites is a significant concern and abrogates conclusive results. Should the university desire continued investigation in this process, the following recommendations are suggested.

Recommendations

• This study could be strengthened by collecting more thorough data from comparison programs. For increased accuracy, data should be obtained from university reporting bodies that are equivalent to UW-Stout’s Office of Budget, Planning, and Analysis or similar statistical reporting offices.

• Further analysis would be beneficial to examine the relationship of polytechnic universities to stakeholders outside of the campus community. At a minimum, these would include K-12 educational programs, state and federal agencies, and local business and industry.

• Consideration should be given to a broader array of comparison institutions, including those with a technology, institute of technology, or technological designation. While initially included in the present study, considerable variability among programs and inconsistency regarding the meaning of the term “technology” made comparative analysis difficult. Inclusion of this data was ultimately discarded given the time constraints of the steering committee and the breadth of the committee’s charge.

• It is essential to conduct a study of the long term impact of a designation change on all departments and programs on campus. Programs that do not have a technology focus may be placed at a disadvantage in terms of future funding allocation should the university be given a polytechnic designation. This could have a significant impact on the ability of these programs (particularly those in the College of Human Development and School of Education) to remain financially viable.

• Inquiry into the impact of a polytechnic designation on extramural funding should be completed in detail. The information reported in the present study based on insufficient data and provided cursory results at best.
• A thorough appraisal of long term effects is needed, including discussion of the potential impact of a designation change on standing within the University of Wisconsin system, extramural funding opportunities/restrictions, future program development, and community outreach programs (such as Stout Solutions and Stout Vocational Rehabilitation Institute, Northwest Manufacturing Outreach Center, and Stout Technology Transfer Institute).

The designator choice should not be taken lightly, and any decision to change the university’s status should be made after careful deliberation and consultation with the campus community, governance bodies, and other key stakeholders.

In closing, the committee would like to express its appreciation to all who participated in the information gathering process. In particular, the committee wishes to thank Dr. Christina Bailey from CalPoly San Luis Obispo who graciously offered her insights and personal experiences of working at a polytechnic institute to the UW-Stout campus community.
Appendix A: Distribution of Students among Program Majors at UW-Stout

<table>
<thead>
<tr>
<th>College of Arts &amp; Sciences</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Math &amp; Computer Science</td>
<td>212</td>
<td>201</td>
<td>198</td>
<td>177</td>
<td>152</td>
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<tr>
<td>Art</td>
<td>778</td>
<td>749</td>
<td>738</td>
<td>711</td>
<td>674</td>
</tr>
<tr>
<td>Applied Science</td>
<td>-</td>
<td>11</td>
<td>31</td>
<td>68</td>
<td>66</td>
</tr>
<tr>
<td>Technical Communication</td>
<td>23</td>
<td>40</td>
<td>65</td>
<td>81</td>
<td>65</td>
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<tr>
<td>College of Human Development</td>
<td>1,344</td>
<td>1,409</td>
<td>1,432</td>
<td>1,547</td>
<td>1,535</td>
</tr>
<tr>
<td>Dietetics</td>
<td>123</td>
<td>106</td>
<td>111</td>
<td>117</td>
<td>114</td>
</tr>
<tr>
<td>Food Systems &amp; Technology</td>
<td>36</td>
<td>43</td>
<td>44</td>
<td>44</td>
<td>47</td>
</tr>
<tr>
<td>Hotel, Restaurant &amp; Tourism Management</td>
<td>493</td>
<td>497</td>
<td>492</td>
<td>469</td>
<td>440</td>
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<tr>
<td>Human Development &amp; Family Studies</td>
<td>192</td>
<td>209</td>
<td>203</td>
<td>250</td>
<td>265</td>
</tr>
<tr>
<td>Psychology</td>
<td>280</td>
<td>295</td>
<td>302</td>
<td>330</td>
<td>306</td>
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<tr>
<td>Service Management</td>
<td>57</td>
<td>80</td>
<td>81</td>
<td>99</td>
<td>107</td>
</tr>
<tr>
<td>Vocational Rehabilitation</td>
<td>162</td>
<td>179</td>
<td>199</td>
<td>238</td>
<td>256</td>
</tr>
<tr>
<td>College of Tech, Engineering &amp; Mgmt</td>
<td>2,692</td>
<td>2,786</td>
<td>2,790</td>
<td>2,787</td>
<td>2,863</td>
</tr>
<tr>
<td>Apparel Design &amp; Development</td>
<td>109</td>
<td>125</td>
<td>139</td>
<td>177</td>
<td>212</td>
</tr>
<tr>
<td>Applied Technology**</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Construction</td>
<td>304</td>
<td>317</td>
<td>331</td>
<td>331</td>
<td>357</td>
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<tr>
<td>Engineering Technology</td>
<td>266</td>
<td>233</td>
<td>230</td>
<td>262</td>
<td>315</td>
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<tr>
<td>General Business Administration</td>
<td>982</td>
<td>900</td>
<td>903</td>
<td>866</td>
<td>890</td>
</tr>
<tr>
<td>Graphic Communication Management</td>
<td>207</td>
<td>206</td>
<td>181</td>
<td>169</td>
<td>135</td>
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<tr>
<td>Industrial Management</td>
<td>59</td>
<td>103</td>
<td>167</td>
<td>166</td>
<td>175</td>
</tr>
<tr>
<td>Manufacturing Engineering</td>
<td>187</td>
<td>151</td>
<td>135</td>
<td>161</td>
<td>128</td>
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<tr>
<td>Packaging</td>
<td>141</td>
<td>160</td>
<td>151</td>
<td>152</td>
<td>177</td>
</tr>
<tr>
<td>Retail, Mech and Management</td>
<td>203</td>
<td>239</td>
<td>280</td>
<td>230</td>
<td>332</td>
</tr>
<tr>
<td>Telecommunication Systems</td>
<td>233</td>
<td>262</td>
<td>232</td>
<td>213</td>
<td>142</td>
</tr>
<tr>
<td>School of Education</td>
<td>1,314</td>
<td>1,318</td>
<td>1,316</td>
<td>1,161</td>
<td>1,055</td>
</tr>
<tr>
<td>Art Education</td>
<td>129</td>
<td>101</td>
<td>93</td>
<td>84</td>
<td>88</td>
</tr>
<tr>
<td>Career, Tech Education &amp; Training</td>
<td>50</td>
<td>79</td>
<td>73</td>
<td>66</td>
<td>75</td>
</tr>
<tr>
<td>Early Childhood</td>
<td>522</td>
<td>484</td>
<td>505</td>
<td>433</td>
<td>405</td>
</tr>
<tr>
<td>Family &amp; Consumer Science Education</td>
<td>87</td>
<td>94</td>
<td>82</td>
<td>83</td>
<td>70</td>
</tr>
<tr>
<td>Marketing &amp; Business Education</td>
<td>139</td>
<td>161</td>
<td>153</td>
<td>139</td>
<td>106</td>
</tr>
<tr>
<td>Technology Education</td>
<td>387</td>
<td>390</td>
<td>410</td>
<td>356</td>
<td>311</td>
</tr>
<tr>
<td>Other Undergraduate</td>
<td>799</td>
<td>744</td>
<td>746</td>
<td>569</td>
<td>563</td>
</tr>
<tr>
<td>Undergraduate Total</td>
<td>7,162</td>
<td>7,258</td>
<td>7,316</td>
<td>7,101</td>
<td>6,973</td>
</tr>
</tbody>
</table>

Source: UW-Stout Fact book, 2005

*Includes 'I' major only
**Discontinued/ inactive programs
Appendix B: Grant Funding of Peer Institutions

As the Polytechnic review process moves forward at Stout, we wanted to evaluate the potential impact the designation may have on the campus grant activity. As part of the review process, we reviewed data on four peer institutions, Cal Poly San Luis Obispo, New Jersey Institute of Technology, Ferris State, and Southern Illinois University-Edwardsville, (as identified by Meredith Wentz, BPA). The review of those institutions included the number and type of degree programs, funding sources and enrollment. Cal Poly is the only school of the four that does not offer a Doctoral degree, although they have a joint Doctoral Degree with UC Santa Barbara in Educational Leadership.

Summary Chart of Institutions

<table>
<thead>
<tr>
<th></th>
<th>Cal Poly</th>
<th>New Jersey Institute of Technology</th>
<th>Ferris State</th>
<th>SIU-Edwardsville</th>
<th>UW-Stout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Undergraduate Students*</td>
<td>16,637</td>
<td>5,366</td>
<td>10,711</td>
<td>10,945</td>
<td>7,337</td>
</tr>
<tr>
<td>Number of Graduate Students*</td>
<td>945</td>
<td>2,883</td>
<td>505</td>
<td>2,232</td>
<td>554</td>
</tr>
<tr>
<td>Undergraduate Degree Programs*</td>
<td>66</td>
<td>33</td>
<td>98</td>
<td>43</td>
<td>29</td>
</tr>
<tr>
<td>Graduate Degree Programs*</td>
<td>23 Master's 1 Doctoral</td>
<td>40 Master's 19 Doctoral</td>
<td>23 Master's 2 Doctoral</td>
<td>41 Master's 2 Doctoral</td>
<td>18</td>
</tr>
<tr>
<td>Institutional Rank of R&amp;D Expenditure**</td>
<td>229 of 599</td>
<td>136 of 599</td>
<td>590 of 599</td>
<td>228 of 599</td>
<td>425 of 599</td>
</tr>
<tr>
<td>Total R&amp;D Dollars in Thousands **</td>
<td>14,002</td>
<td>61,424</td>
<td>64</td>
<td>14,043</td>
<td>1,358</td>
</tr>
</tbody>
</table>

*Data compiled from respective institutions websites  ** NSF FY2002 Data  
http://www.nsf.gov/statistics/profiles/alphlist.cfm#F

Peer Institution Funding/Research

Based upon the review of a sampling of the peer institution grant awards, funding is based upon their program offerings. Each of the four institutions currently has more programs offerings than is offered at UW-Stout (see chart above). Based upon the latest institution profile (2002 NSF), only Ferris State had significantly less federal research funding than Stout. In general typical funding sources include Department of Education, National Science Foundation, Department of Justice, Homeland Security, Department of Army, and the Department of the Navy. Funding is directly tied to the programs offered.

Future Activity at UW-Stout

As UW-Stout continues to diversify and expand our extramural funding portfolio, special attention is being paid to funding new, emerging programs and concentrations such as Biotechnology, Nanotechnology, Polymer Science, Information and Cyber Security, Food Packaging, and Engineering. Specific new funding sources are planned to include Small Business Innovation Research (SBIR) program through various Federal agencies, Homeland Security, and the Department of Agriculture. In addition, our plan is to continue to increase submissions to the National Science Foundation including the Research Experiences for Undergraduates (REU) and
Research in Undergraduate Institutions (RUI) programs here at Stout. The School of Education's science teacher education may also result in additional funding since the President has identified it as a target area, especially for disadvantaged and gifted math/science students.

Report prepared by Research Services, UW-Stout.
Appendix C: Interview Questions for Dr. Christina Bailey, California Polytechnic State University

1. What does the term “Polytechnic" mean to CalPoly?

2. What are the critical elements of a “Polytechnic" university?

3. What are the advantages and disadvantages of a university being designated as a “Polytechnic”??

4. What are the pros and cons for a university to transition to a “Polytechnic" designation?

5. What are the positive or negative perceptions associated with being a “Polytechnic" university?

6. CalPoly is a part of a 23 school Cal-State system. What do you feel has distinguished CalPoly from these other institutions?

7. Does the “Polytechnic” designation affect CalPoly’s ability to secure extramural funding? How do you think this compares to the other Cal State institutions?

8. Which is more important in developing or maintaining a university image: the program array or the “Polytechnic” designation?

9. Compared to other Cal State institutions, what is the role at CalPoly of (a) the Humanities, (b) Social Sciences, and (c) Teacher and Counselor Education?

10. What is the makeup of your Student Services support areas; does it include areas like: Academic Advisement, Career Services, Counseling, Disability Services, Educational Talent Search, and Multicultural Student Services?
Appendix D: Comparison Matrix
See attached spreadsheet.