Denice D. Denton Memorial Symposium July 30, 2007
Report out on breakout session "21st century undergraduate STEM learning environments"
by Terry Millar and Leya Moore

Vicki Bier: – very brief summaries from the three breakout sessions. I know that an hour and a half of discussion, and hour and a quarter, especially there's a lot more information than you will be able to present here, and so people should know that WISELI will be – and the organizing committee – will be summarizing the findings of all three breakout sessions and thinking about how best to disseminate those. But we did want to have some brief highlights for the whole group to share in what we've discussed in the three sessions. Science and engineering education – I understand that the presenters for that will be Terry and Leya. Are you both able and ready to speak?

Terry Millar: Sure.

Vicki Bier: Okay, come on up.

Terry Millar: So again, I'm Terry Millar, math department and Graduate School. And Leya –

Leya Moore: Hi, I'm Leya Moore, doctoral student in counseling psychology, and working with the School of Engineering, pardon me, the College of Engineering mentoring program.

Terry Millar: So we had a very lively discussion, and we sort of had to cut it off. We tried to cover a lot of ground. One of the things we realized is that for undergraduate learning environments, one should probably extend this – certainly Denice would have been sympathetic and would have promoted this idea – you really want to think of K-through-infinity learning environment because they're all connected in ways that it's worth reflecting on. The other thing we talked about is how much research and what are called best practices of quality that exist out there that sit on shelves, or that are, you know, you see them in this college or this university, and in that university, only in this department and not in other departments. So in the end we decided that our bullet points that we thought would best summarize the discussion the way that might be significant to colleges and universities is that universities have a responsibility, for action, so, let's see, the responsibilities for awareness, action, and analysis.

So to elaborate on that a bit, awareness of the research that's already been done on teaching and learning, and a promotion of that awareness in a culturally aware fashion within the institution. In other words, different institutions have different change agents, sometimes at the provost, sometimes at the dean, sometimes at the department, sometimes it's a linear combination. So it's not just about saying, "I'm aware," but "I'm promoting that in the institution. We are promoting this in ways that are meaningful within the institution." So how is it that it's meaningful? Well, it should translate into action. And it should translate into action that is informed by that awareness that it attempts to improve

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undergraduate education in innovative ways. And then the third, which is analysis – it's not so good to do something and then not measure it and not measure it according to benchmarks. So when you take those actions that are culturally sensitive, that make sense in terms of faculty and staff and graduate student and postdoc culture, you should have realistic goals and benchmarks that you measure your result on the spot. So that's the analysis part. And there's one example that, and this is certainly something that's been tried in many different contexts, a particularly easy, an entry point for doing this is in a first-year course. And so, you know, the engineers in the room will certainly know, and you know – it's not like our university and other universities haven't tried this, but this is a way to promote interdisciplinary approaches to courses that would be relevant to people that have an interest in STEM courses. Of course, this is probably a valuable lesson beyond STEM, but certainly for STEM: science, technology, engineering, and math.

And then, in honor of Denice, who always, as we've heard from various speakers, was aware of her community and touched and reached out and listened to people, Leya made a couple of remarks, and she agreed to share those remarks with us because they're all pretty good recommendations.

Leya Moore: Yes, I was sort of roped in, but I feel that apparently this is something that Dr. Denton would have done, was pull in students to give some feedback, and so I feel honored to have that role for this group. I thought the learning environments conversation was very invigorating and exciting. One of the things that I'm particularly interested in as a student is, how did you learn about the opportunities that you took advantage of? I think that, for best practices for learning environments, we could think about how we're going to communicate these opportunities to the students, and who are these students that we're reaching out to? And then the other one comment or question was, extending the learning environment beyond the first-year experience to the second year, the third year, the fourth year, the fifth year in my case. I know the TRIO Program, or TRIO Student Support Services is building a second-year experience, and I'm not familiar with the rest of the university system, at least at UW-Madison as far as their second-year experience or beyond, but that was one of the things we wanted to do as far as best practices.

[*Applause*]