

From: Kenton Rodgers
Sent: Thursday, January 22, 2015 6:18 PM
To: Larry Peterson
Cc: Lawrence Reynolds; Bernhardt Saini-Eidukat; Allan Ashworth; Birgit Pruess; Seth Rasmussen
Subject: RE: Faculty senate agenda concerns

Dear Larry [Peterson :o]:

Thanks for your note. Please see the interleaved comments below. My intent was not necessarily for you to see this all again, as most of it is reiteration of our earlier communications.

Regards,
Kent

From: Larry Peterson
Sent: Thursday, January 22, 2015 3:28 PM
To: Lawrence Reynolds; Kenton Rodgers
Subject: RE: Faculty senate agenda concerns

Hello Larry and Kent,

I'll do my best to respond to Kent's concerns.

First of all, I'd like permission from both of you to share our communication with the rest of the members of CULE.

As with our previous communications about this, that is fine with me. However, if you do that, I would appreciate knowing what the Committee's thoughts about these concerns are. Minutes from the most recent meetings have not been posted on the CULE web page.

Second, the next Monday's Senate meeting is simply a presentation of the GE model with a chance for senators to ask questions and provide feedback. We had the first of four open forums on the this proposed model yesterday and we will have three more on

February 3, Tuesday, 10:00-11:30, Rose Room, Memorial Union

February 12, Thursday, 1:30-3:00, Rose Room, Memorial Union

February 24, Tuesday, 9:00-10:30, Rose Room, Memorial Union.

I am aware of the open forums and will do my best to attend at least one of them. All but one are at times when I have previously scheduled commitments.

Third, please remember the focus of this proposed model is what is common for all NDSU undergraduates. When it comes to science, we are really looking at the 40% (at the most) of the undergraduates who are not science or engineering majors. This may be their last formal educational experience with science. What will prepare them best to be scientifically literate citizens (and perhaps partners and parents)?

Yes, I am aware of the focus. Scientifically literate citizens, elected officials, policy makers, teachers, etc. need to know what science is, how it is done. If there is a strategy for achieving this outcome within an attenuated science requirement, it is not apparent in the proposal. As music literacy requires some knowledge of music, scientific literacy does require some knowledge of science. Students may or may not gain that knowledge from a course that focuses on critical thinking. But critical thinking skills are quite likely to improve in a course that focuses on science.

Fourth, as far as use of word “science” is concerned, I am going to quote my response to Ken Lepper on this topic:

“The ‘Natural and Physical Worlds’ language was approved by the Faculty Senate (both in 2013 and 2014) and was certainly not intended to be in any way whatsoever an assault on science. [“Assault on science” refers to Ken Lepper’s email.] The bullets that elaborate on that learning outcome (below), I hope are evidence that this is not part of an anti-science agenda.

“Students will

- analyze components and dynamics of natural and physical worlds
- develop models to explain phenomena within the natural and physical worlds
- identify the role of scientific methods in the study of natural and physical worlds”

OK, but if the students are not required to take a science course, how will these outcomes be achieved? To me, this is not at all clear from the proposal. I agree with Ken Lepper and others who are concerned that under the current proposal, the word “science” would vanish from the general education outcomes. When I was a Faculty Senate member, I supported the approval of the plan to move forward with new outcomes. At that time, I understood you to say, on behalf of CULE, that we (the Senators) were only giving approval to move forward to generate a proposal. Under that assurance, the Senate did not approve any specific language. Had I known that our approval of the process was tacit approval of the language, I would have staunchly opposed it. The word “science” should not be eliminated from the outcomes or the requirements.

By the way, I feel just as strongly that students of the sciences should be required to take courses in, for example, the arts and humanities. Thus, I am equally frustrated that those words are absent in the proposal. The only place they occur is in the table of present GE requirements.

Other faculty have also contacted us to express their concern about the removal of the laboratory requirement. Our decision to make that recommendation was based on the concern that the value of the present lab courses for non-science majors. We will certainly be reviewing all the suggestions and feedback about the proposed model.”

In my view, the value of the lab/field experience is that our students learn, through hands-on experience, what it means to do an experiment, make observations, gather and interpret experimental/empirical data and report results. Important stuff for citizens of our time and next generation leaders, policy makers and teachers. And I do not accept that these things

cannot be learned in a lab course that is built around following procedures in a “cookbook” fashion. Much of scientific experimentation by professional scientists involves following carefully established procedures. This is an important aspect of experimental science that underpins reproducibility and laboratory/workplace safety.

Many in the academy are claiming that active learning is critical in modern education. Indeed, some are saying that to omit active learning from the educational experience borders on malpractice. Yet CULE is proposing to remove the quintessence of active learning – the laboratory experience – from the gen. ed. curriculum. I’m looking for any kind of sense in this; I can’t find it. So I hope “reviewing all suggestions and feedback” means revisions will be made in accord with concerns of the faculty.

When I look at the bullets under the Learning Outcomes, I see science explicitly or implicitly in outcomes such as: Diversity and Global Perspectives

- “identify the role diversity plays in the ability of biological organisms to adapt to a changing environment”
- “analyze how diversity contributes to and shapes solutions to challenges confronting the global community”
- “evaluate how diverse systems (both natural and human-made), technologies, or innovations emerge from, interact with, and affect various communities”

and in Personal and Social Responsibility

- “identify stewardship of the land and its people as integral to a land-grant university”
- “analyze human impacts on the world and the importance of sustaining its resources for future generations”

All well and good. But to presume that these outcomes will be achieved outside of a course in one or more the sciences may be overly optimistic. For example, could the first outcome in the above list be achieved without a course in biology? Possible, but unlikely. I (and others, I suspect) would like to know exactly how these outcomes will be achieved before a proposal is approved.

Continuing on the language theme, I would suggest that the words “identify,” “analyze” and “evaluate” be replaced by “understand.” In my view, identification, analysis and evaluation are all necessary for understanding, but not sufficient to ensure it.

Fifth, this model does shift away from disciplinary content and toward lifelong learning. Yes, Science and Technology would go from 10 to 6 credits. Fine Arts, Humanities and Social Sciences goes from 14 credits to 6. The emphasis is now on transferable, non-discipline specific learning such as “Critical Thinking, Creative Thinking, and Problem Solving” and on “Personal and Social Responsibility.”

I have no hesitations or equivocations regarding the value of learning in cross disciplinary environments. However, your suggestion that disciplinary content and lifelong learning are mutually exclusive is curious. Do you mean to suggest, for example, that critical thinking about the possible risks of global warming in the background of political rancor could be fruitful without some basic knowledge in the sciences? Is critical thinking about strategies for slowing

the spread of Ebola in West Africa really feasible without some knowledge and appreciation for the cultural norms of those societies? Not to put too fine a point on it, but no, probably not. Truly critical thinking about a “wicked problem” requires enough basic knowledge that a person can undertake fruitful self-study of its parameters. At the end of the day, that ability requires assimilation of “disciplinary content.”

Sixth, the CULE group discussed the laboratory science issue again this Tuesday. With the authors’ permission, I have been sharing the emails on this topic we have received from Don Schwert, Kent Rodgers, and Ken Lepper. Seth Rasmussen was clear in this meeting and in previous meetings that he is very **dubious** about how much science education (for those non-science majors) actually happens in our current GE lab courses. The current student member of CULE (a non-science major) certainly felt as if he had not gained much from his required lab course. Consequently, we decided to make no changes at this point, pending feedback we get from faculty and other stakeholders.

To be clear, I respect Dr. Rasmussen’s views on the effectiveness of the Chemistry lab classes. Does he have first-hand knowledge to support that view of other labs? In any case, I simply cannot accept that such experiences are necessarily ineffective. To remove the requirement precludes the possibility of improving the laboratory and field experiences for the foreseeable future. We live in a time of increasing need for solutions to technically-rooted societal challenges. Implementation of those solutions will require an informed electorate, one in which some critical fraction has an appreciation for science and what is required for it to succeed. In that context, the wisdom of diluting or diminishing the science and tech content requirement and omitting the gen. ed. lab requirement is, well, dubious.

Finally, I’m glad that faculty are engaged with this issue. It would be tragic if we were discussing revising our GE and faculty were indifferent.

Please contact me if you have other questions or comments.

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