Program Review – Annual Program/Discipline Update

Administrative Response and Follow Up

Winter 2021-2022

Program/Discipline: **Chemistry**

SAC Chair(s): **Patty Maazouz & Stephanie Bryan**

SAC Administrative Liaison (Director or Program Dean): **Ken Friedrich** (outgoing interim 2021-2022) & **Matt Glazewski** (incoming interim 2022-2023)

Other Dean(s) or Director(s):

Department Chair(s): **Tony Zable, Vicki Schroeder, Mike Mackel, Jim Schneider**

Date: **18 March 2022**

This section is for Administration to provide feedback.
To be prepared by Program Dean(s) and reviewed by Pathway Dean and AVPs.

Because this response comes to you during a transitional period, this response is a collaboration between Dr. Kenneth Friedrich (outgoing Interim Temporary Program Dean for Sciences), Matt Glazewski (incoming Interim Program Dean for Physical Sciences), and Dr. Alyson Lighthart (Pathway Dean for Sciences, Computing, and Engineering). First and foremost your deans who support chemistry would like to acknowledge the time and effort that went into preparing this Annual Discipline Update (ADU) for PCC, which occurred on top of your primary / priority work of supporting your students through year 2 of a global pandemic.

1. **Strengths and successes of the program as evidenced by the data, analysis and reflection:**

Members of the Chemistry SAC have been up to big things in the last year, both as regards teaching (e.g. new Norton textbook and online homework system, new ways of teaching F2F learned through the pivot to remote teaching, and ongoing revision of learning materials, labs, quizzes, & exams) and professional development (one instructor attended NCORE Academy last year!) We are glad that the CH SAC participated in the STORI course development offered through the Online Office to improve hybrid delivery of CH 100 and CH 151. The ongoing work to develop an OER textbook for CH 151 and to create accessible WeBWoRK questions for homework is to be highly commended as well!

In the coming year, we encourage you work, as you suggest, on:

- Continue to look at consistent course material selection for the General Chemistry Sequence (CH221, 222, and 223), to:
    - make it easier for students who need to move from campus-to-campus.
    - make lower cost materials available to the students.
- Continue to align the lab curriculum to easily transition from remote teaching to in-person labs to accommodate for the anticipated student COVID absences for Organic Chemistry (CH241, 242, 243).
- Implement the CH151 and CH100 STORI projects at the different campuses district-wide, with particular focus on:
    - accessibility, and
    - culturally responsive teaching materials.
- Also, per your response to the LAC feedback, implement your revised assessment tool for the Learning Assessment Council work this year.

We also encourage you to reopen the data that was provided to you for this ADU, and analyze at very least the demographic data. A thorough analysis of the data may help you to see where the need is greatest, and thereby help prioritize where you spend your time and resources. Our goal at PCC is for all students to succeed at equal rates. We know that your time is limited, and valuable, and we want you to use it in the most effective way possible. Supporting belonging, justice, equity, diversity, and inclusion (B'JEDI) in your classrooms is most likely to be the most effective way to spend your limited resources.

2. Areas of challenge or concern, if any:

We understand and agree that we are in difficult times, characterized by many changes. At PCC we are in the middle of the reorg, and simultaneously initiating a return to campuses after more than two years away from our offices. Our students have faced untold challenges during two years of global pandemic. So have our faculty and staff. So it's impossible to have all the answers to why the data looks the way it does. This being said, we still think that you can make useful observations from the data that was collected.

Last year you requested more access to data from IE that you could more easily manipulate. Many other SACs also had this request and a more interactive platform, although not perfect, was put in place. Sessions were held to introduce faculty to how to use this interactive platform. Other SACs found this very useful for manipulating the data into a form (i.e. spreadsheets, graphs, tables, etc.) that worked for them to analyze. As such, we are disappointed that you did not reach out to your dean or contacts in academic affairs to get assistance in addressing the data that was provided to you. We encourage you to engage the resources provided to a greater extent to complete next year's ADU.

Although the data collected may have limitations as you have pointed out, we think that there are still useful observations that can be made when looking at the data, which can prompt the SAC to ask questions that you wish to seek an answer for. You mentioned many observations

in your ADU (e.g. that there may be a need to increase the number of CH 102 sections offered or that CH 242 & CH 243 courses have high success rates). This being said we were expecting a more thorough analysis. We looked at the data and made a number of observations concerning the prompts in section 2 that stood out to us. We are including them below as well as a response to the observations you made in your ADU.

Modality:

1) Overall success rates continued to hover around the 80% success rate in the transition from in-person to remote instruction for chemistry courses.
2) CH 104 and CH 106 may have seen a slight dip in success rates when transitioning to remote learning.

You mention data that shows students are less successful in their science lab courses when they are taken online. As we return to on campus teaching in the coming months, your deans would encourage you to explore ways to build belonging in your classes, to help students succeed in both face-to-face and online courses, and at similar rates. From the sounds of it, our students are up to two years behind on hands-on lab skills, and will need significant attention in order to bring them up to speed in whichever lab they are now in. This is true of all students across the globe, as we've all faced COVID together. The question is, how do we help our students get back on track now? Perhaps you could have a group reflection on what COVID has changed for in-person instruction permanently, and an evaluation of resources needed to help adapt toward our new future? If you bring suggestions, it will be easier for the deans to support your initiatives.

PCC is working on addressing the distinctions between online and blended courses, and where synchronous or asynchronous delivery would come into play, going forward post-pandemic. In the meantime please work with your SAC in the April meeting to determine what modalities would most optimally support teaching and learning in Chemistry going forward. Your feedback will help inform the committees that are addressing these issues.

PCC is also working to get people back on campuses. Our ISTs have been back on campuses for quite some time supporting classes. Some of the IAAs are coming back soon as well, and all of them are accessible to you via email, phone, chat, or Zoom. We have offered labs on campus for a number of terms now. And we struggle to fill those labs. This indicates that there is a big disconnect between what we are offering and what students are wanting or willing to do.

There is no way that PCC will look like it did before COVID--neither all the students nor all the faculty nor all the staff want to be back F2F all day every day. Everyone is calling for more flexibility going forward. Additionally, IAA coverage after the reorg is not campus-based. Chemistry is supported by one IAA-3 and 1½ IAA-2s, spanning only two of the four campuses. Most of your needs for IAA support will be fulfilled by reaching out by phone or email to them. While we do hope to have office staff of some kind at each campus to support place-based needs (e.g. jammed copy machines, or supply needs, or unlocking doors), there are aspects of

the reorg that will always be “remote”. All that having been said, PCC intends to be mostly back by Fall term; we do intend to return as many lab courses to campus as possible by then.

Gender:

1) Male students appear to be less successful in CH 106 and CH 242.

Race:

1) Black, Latinx, and Native Hawaiian/Pacific Islander students have significantly overall lower success rates.
2) This is true for Black and Latinx students in CH 100, 104, 151, and 221. The trend continues for Latinx students in CH 222 and 223 but not for Black students.

An area of concern that jumps out to us in your data are the lower success rates of BIPOC students in all your courses. We have had the opportunity to dive into the demographic of all the science courses through these ADUs, and we can tell you that not all the lab science courses see the same demographic gap, though you’re pulling similar students from the same PCC pool. We know that many of our students are one flat tire away from going sideways in their courses. We also know that the more sense of belonging they have in their classes, the more likely they are to fight through the obstacles and succeed. We would encourage the SAC to discuss and explore what might be happening in CH 222 and 223, to so notably improve the success rate for Black students. This may lead to possible insight and proposed changes in other courses to help BIPOC students succeed at equal rates with other students.

We encourage every member of the Chemistry SAC to take the professional development that PCC offers in culturally responsive teaching and in building a sense of community in your classes, and to apply what you learn to all your classes.

3. Reflection on goals and resources:

We are excited for the return to campuses, and the concomitant return to in-person laboratories that this will enable. Chemistry has been a strong leader and advocate for returning to the in-person laboratory experience. We appreciate your commitment to providing this important experience for your students and acknowledge the logistical challenges that have been associated with the ramping up of more and more in-person offerings.

In regard to academic integrity and homework sharing sites such as Chegg and CourseHero, we recognize that there can be no single solution to this problem. The CH SAC is encouraged to engage with faculty peers, with the TLC, and with our Online Learning office to continue exploring assessment options that may look very different from those historically used to assess student learning. Assessments that are contextualized, especially if local and current, are less susceptible to Chegg or similar platforms and, in addition, these can engage students who may not easily identify as STEM students. Inquiries to PCC’s legal team will be made by your

incoming Program Dean to see if there are larger efforts that we can leverage in discussions with these private sector entities. Similarly, your new dean will reach out to other institutions that are battling this problem to determine if another course of action could be fruitful. In the meantime, please as always email your concerns about specific students to conductandcare@pcc.edu.

Late in Winter term you were offered the opportunity to join a science-only cohort of professional development training around equity and inclusion. The goal of this training is to build a foundation to enhance our collective understanding of racial equity, in order to better understand and respond to racially-charged situations. If you are able to join this cohort, you will work with an excellent trainer to:

- build a glossary of shared terms (something which I've recently come to discover we really do not have yet in the sciences, even when (or perhaps especially if) we think we do);
- understand implicit bias, structural racism, and microaggressions;
- understand our own power, privilege, and identity by looking at our place in the world through a variety of lenses; and
- understand oppression, and how it impacts us all.

We are particularly excited about that first goal of building a common language across the college and within our pathway. We hope that as all our faculty come together in understanding these concerns, we can also come together in making our classrooms a safer space for our students. If you are not able to join this cohort, please seek out other professional development around belonging, justice, equity, diversity, and inclusion, or watch your email for opportunities forwarded by your deans. Consider also reading this short article from the Chronicle of Higher Education about alternative approaches to high stakes testing (that coincidentally are plagiarism-proof!). Or check out How Humans Learn, by Joshua R. Eyler, which has a number of excellent chemistry-related examples scattered throughout the text.

Students of color were mentioned exactly once in your ADU, in this context: *"There is an extra lab kit cost associated with the online courses. We need to determine if this additional expense disproportionately impacts students of color."* Both the absence of any consideration for success rates by demographic in your data and the assumption here that students of color = poor for our students are deeply concerning. We hope that as you enroll in and complete this professional development, you will begin to be concerned as well.

We hope that your SAC will begin to explore culturally responsive teaching with regard to course design. This is as much about having students be able to see themselves in the sciences (a mirror in your classroom) as about seeing the possibilities of sciences in their lives (more like a window to the world). The door is also important, and we also acknowledge that part of this work is also offering flexibility to students in how they meet the CCOGs. The mirror would show them chemists of color (like Mae Jemison), or it would show them chemistry-related issues that are faced disproportionately by people of color (as with the Flint water crisis).

We absolutely commend your faculty who are offering more flexibility in due dates, and mastery-based learning as a way to give students an opportunity to succeed in your classes. This supports all our students. It is not in itself culturally-responsive teaching. From the aforementioned linked 2021 AACT article: *"Cultural responsiveness in the chemistry classroom is a powerful approach that can allow teachers to improve engagement and equity in their classrooms, and bridge the cultural divide that sometimes exists. Culturally responsive teaching recognizes students' cultural background and uses appropriate resources to empower all students to excel in the sciences. It can also work to increase student interest in pursuing careers in the health sciences, as well as interest in other disciplines in which a knowledge of chemistry is important. Culturally responsive teaching is asking chemistry teachers to "reenvision" their classrooms — not by throwing out lessons or activities that we know work, but rather by building on successful practices already in place."* We encourage the SAC to explore the differences and similarities, and to lean into bringing culturally responsive teaching into each of your classes.

In addition to the college-wide focus on belonging, accessibility, justice, equity, diversity, and inclusion that were held as the center of the transition to One College, we also hold the goal of getting the campuses to parity in their resources. To that end, we would like to share with you this spreadsheet to collect your ideas to better support CH across all 4 campuses, and help get us to truly be One College. Please as you have that conversation consider also that we have centers at Newberg and Hillsboro that would love to take on science classes. Are there PHY lab classes that are *not* materials intensive that might work there? Or could there be a portable set of lab supplies that could be moved from place to place? Does anyone in your SAC live near those centers, such that it wouldn't be a huge thing to ask you to teach there?

4. Recommended next steps:

_*_ Proceed as planned on program review schedule**

_*_ Follow up conversation needed with SAC, Dept Chair(s) and Dean**

Follow-up conversations are needed in order to bring many of these recommendations into reality. These conversations should include at least the Interim Program Dean for Physical Sciences and the Pathway Dean for Sciences, Computing, and Engineering.

5. Additional comments/questions:

We want to thank all contributing members of the Chemistry SAC, for your continued hard work in support of PCC students. We know these past two years have not been easy, and you have done great work in supporting your students and each other. Please always feel free to reach

out to your Pathway or Program Dean for assistance as needed, as we begin our long-awaited transition back to campuses.