

2007-2008 Annual Program Review

Chemistry 7-12

Name of Program: Chemistry (7-12)

List of Annual Reviewers: Robin B. Reed, Ph.D.
Chair of Chemistry Department

I. Assessment of Candidates:

For the five year period of Fall 2003-Spring 2008, the number of candidates successfully completing the teacher education program to be certified in Chemistry (7-12) is low with only seven fulfilling those requirements. Therefore, the data collected regarding the quality of students graduating from APSU with Chemistry certification should be viewed with much skepticism. For those seven students, the average score on the ETS was 159.5 while the passing score was only 152 indicating that our students are not performing in an exemplary fashion on this test. This is also indicated in the data that there were three retakes on this exam before passing. Whether this was one student retaking the exam three times or three different students retaking the exam is not clear from the data provided. Regardless of the reason, it is apparent that chemistry education students are not performing as well on this standardized test as this reviewer would like. However, it should be noted that of these seven students, only two actually completed any undergraduate chemistry courses within our department. The other five students only attended APSU as graduate students and presumably completed their national exams as a graduate student. It is also not clear how many years may have elapsed since these five students completed their undergraduate degrees in chemistry and the time that their battery of exams was completed.

With regards to the low number of chemistry education students completing the program in the last five years, this reviewer is not too concerned as the number of students in any given year seems to be cyclic with some years having a few students and other years having no students. There is, however, a recent movement toward more students seeking alternative licensure pathways instead of pursuing the traditional program being assessed herein. For example, in the last couple of years, one student has completed alternate licensure while two others are attempting to follow suit. It is likely that the number of students seeking alternative licensure will continue to rise due to the:

- 1) current shortage of teachers in science and math
- 2) lure of not being required to complete student teaching
- 3) benefit of being hired directly after graduation without being licensed

To increase the quality of our candidates, it would be beneficial to obtain additional information. For example, the department would like to receive feedback from:

- 1) current teachers who are supervising our student teachers so we would know how said student teachers are perceived in areas of content knowledge, teaching abilities, etc.
- 2) recent graduates who have received licensure and are currently teaching chemistry in the high school setting. These teachers would provide valuable information regarding the quality of preparation to teach chemistry they received while attending APSU.

II. Assessment of Program Operations:

In light of scores of recent candidates that barely average above the minimum passing score, it is apparent that changes to our program are warranted. To increase the performance of our chemistry education students, the department is seeking a change in the chemistry teaching major to become effective Fall 2009. This change will require all chemistry majors (chemistry teacher education students as well) complete MATH 1910 for 5 hours instead of the current option of completing either MATH 1810 (Elements of Calculus) for 3 hours or MATH 1910 (Calculus and Analytical Geometry) for 5 hours. It is hypothesized that some weaker chemistry students choose the teaching major because of this MATH option as well as the available option to complete the brief organic (CHEM 3500) and brief biochemistry (CHEM 4300) sequence instead of the more strenuous year-long organic sequence (CHEM 3510/3520) and the year-long biochemistry sequence (CHEM 4310/4320). Each brief course is only one semester in length and is considered to be less rigorous than the counterpart year-long sequence courses. During the fall 2009 semester the department will consider changes to the organic and biochemistry requirements for the chemistry teaching majors. Any changes made to the chemistry teaching major will only affect incoming students as there are currently no teaching majors in the system. Therefore, no immediate corrective actions are required at this point in time.

Beginning in the Fall 2009 semester, evaluation of the chemistry teacher education program will be reassigned to the one faculty member who has experience as a high school chemistry teacher. Dr. Ron Robertson spent 14 years teaching high school chemistry in Dickson Co., TN and is aptly qualified to evaluate and direct this department's teacher education program.

III. Assessment System:

The current system and data provided are sufficient to allow adequate assessment of the quality of our candidates. Although the number of candidates that we typically produce is low, we are confident that we have an accurate snapshot of the quality of the candidate. To improve the quality of our candidate, as stated in section I. above, it would be beneficial to have feedback from current teachers and student teacher supervisors as to what skills are lacking in our graduates. Additionally, it would be helpful to have more knowledge of the skill sets that potential employers are seeking. This information could be obtained in the form of informal communications with area high schools. This information could also be obtained in a more formalized report such as the sub-scores of our candidates in specific areas tested in national standardized exams. For example, if there is a particular sub-score of the chemistry content knowledge test that is habitually low for our candidates, we could then seek to enhance that area of our curriculum.