Ensuring Success for Biology Majors as They Transfer from the Community College to the University by Aligning Course and Program Outcomes

Our Quality Collaboratives project involved the Elizabethtown Community and Technical College (ECTC) and the University of Louisville (U of L) in Kentucky. ECTC is one of many community colleges in the Kentucky Community and Technical College System (KCTCS). Beginning with this dyad, the project expanded to other community colleges and several other universities throughout the state. The project’s goal was to determine the readiness of associate degree students in Biology as they transferred to the university. We investigated shared outcomes and developed processes to facilitate student transfer based on these course outcomes instead of just course numbers. We also hoped that by encouraging dialogue between the faculty, we could develop a seamless career pathway from the community colleges to the state and private universities.

The basic steps of QC Project are outlined below.

1. We started with a specific discipline: biology.

   Biology lent itself well to this project, as common outcomes were more the norm rather than the exception between the associate degree program and the university. Outside accreditation agencies were not involved.

2. We used a common set of program outcomes.

   We had the advantage of having participated previously in the Tuning\(^1\) process, during which a common set of student outcomes had been developed for both the associate degree and the baccalaureate level in biology. With this head start, we already had faculty contacts at most of the colleges and universities. Even without the Tuning initiative, we think it would have been possible for the faculty of the community colleges and universities to develop a similar document. For example, faculty agreed on the importance of students having a working knowledge of the scientific method. Discussions between the faculty clarified what an associate

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\(^1\) Lumina Foundation’s Tuning initiative is a faculty-driven process that emphasizes student learning outcomes within disciplines.
degree student should know about the scientific method after the first two years of college, and what a baccalaureate student should know after four years of college.

3. The next activity was creating a Curriculum Map and aligning it with the Degree Qualifications Profile (DQP: http://degreeprofile.org/).

   We took the tuning outcomes for biology and mapped them with the community college outcomes for ECTC’s biology majors’ courses. Not only did this process match similar biology course outcomes with tuning outcomes, but it also highlighted some areas that needed to be emphasized. As a result, the ECTC biology faculty made some changes in these biology courses. For example, we expanded our use of research papers and developed a project that asked students to look at some topics from a global perspective. Later, in another workshop, the outcomes for the biology courses were mapped with the DQP. As we tried to align the two documents, we had interesting discussions dissecting the wording of the DQP and how it related to our course outcomes. This exercise with the DQP led to a review of the course assignments and the emphasized outcomes within a variety of course topics. For example, faculty correlated the DQP’s Intellectual Skills with the course outcomes, but they felt certain areas within Intellectual Skills could be emphasized more than they were currently. Faculty could emphasize the Ethical Reasoning area of the DQP in the biology courses during discussions of genetic engineering, while they could emphasize the Oral Communication area in an existing assignment by having all students participate in the presentation of the data, not just a team leader. Except for a few areas, the DQP matched most of the curriculum mapping done with the biology majors’ course outcomes and the tuning outcomes.

4. ECTC biology majors began taking the University of Louisville Student Readiness Assessment.

   The University of Louisville had created a Blackboard pretest to help place their incoming freshman in the correct science courses. They used this same assessment for their seniors as an exit exam. ECTC began utilizing the assessment with the biology majors, who took it as a pretest and then retook the assessment at the end of their two-semester biology sequence. Several other community colleges also used the test as a part of their institutional effectiveness assessment. One conclusion drawn from the assessment data was that the associate degree students scored equally to the incoming university freshman. This was good news, as it validated many of the current course outcomes. When our team compared the
university’s assessment with the curriculum map and the DQP, we found several topic areas to be lacking. Several community college biology faculty are currently revising the assessment by developing additional topic questions. In addition, they are utilizing knowledge obtained through the QC workshops and developing critical thinking scenarios for the assessment. This will create an assessment that does not rely solely on multiple choice questions. Faculty had previously discussed how important it was for biology students to be able to communicate effectively through writing. They had concerns that the current assessment did not measure students’ writing skills. To address this concern, colleagues are developing a writing sample to include as a part of this assessment. The ultimate goal is to create a state-wide assessment for all community colleges and university students. We were not able to devise a good student feedback model for transfer students. While we developed a transfer survey, it was problematic for the university to offer it due to concerns about confidentiality and for the community colleges to find the students’ contact information after they transferred. We feel this is a very important part of the process, and hopefully the transfer of information concerning student progress can be facilitated in the future.

5. The Kentucky QC project engaged with the third annual Workshop for KCTCS Biology Faculty, which continued during the summer of 2015.

These workshops provide KCTCS biology faculty a chance to discuss student learning outcomes, assessment, and best practices. The KCTCS biology faculty previously did not have a venue for this type of interaction, and they were eager to join in these discussions. Representatives from all of the Kentucky community colleges were invited to discuss common biology course outcomes. Topics for the workshops included how to create valid assessments, actual assessment writing for specific courses, best practices in the biology classroom, and possible future revisions of some course outcomes. The 2015 workshop goal was to develop e-portfolios for various biology courses. These e-portfolios can be used to calibrate outcomes for current and newly hired faculty and will be invaluable for working with adjuncts. Ensuring and enhancing quality, these e-portfolios will also create a consistency across the state in meeting course objectives and could facilitate transfer based on these outcomes. While these efforts will result in calibrating common course outcomes and best practices, the faculty will still have the freedom to shape how they attain these outcomes in the classroom. ECTC funded the workshop, and we are hoping this will become a sustainable effort, rotating sites throughout the
system. The summer workshops correlated with Kentucky’s Council on Postsecondary Education efforts as a part of the QC grant.

6. The Council on Postsecondary Education in Kentucky initiated a series of statewide Professional Learning Communities (PLCs), and biology was one of the disciplines chosen.

   Faculty from KCTCS and the Kentucky universities met to discuss shared issues. The last meeting resulted in the establishment of degree pathways from KCTCS to some of the four-year institutions. This effort not only analyzed transfer, but highlighted the differences between regions throughout the state. As this work continues, this will not only facilitate student transfer but keep student learning outcomes for associate degree students current and relevant.

7. An important part of transfer is up-to-date advising.

   The ECTC and University of Louisville biology faculty met and discussed common course outcomes and laboratory protocols for a number of biology courses. Each KCTCS instructor that participated received useful information and gave a positive evaluation. Participants went on lab tours and explored independent undergraduate research opportunities. Our microbiology instructor, for example, realized alternatives for working with live material for certain lab protocols. Ideally a reciprocal trip will occur so the university faculty can tour the community college labs. We have also considered exchange guest lectures along with common biology field experiences. The University of Louisville established a new transfer policy as a result of these discussions. Instead of meeting with a transfer advisor, biology transfer students will contact and speak with a specific biology faculty member. This change will help eliminate misinformation regarding needed coursework and will resolve issues with transfer courses. Contact between the ECTC biology faculty and the faculty advisor at U of L has also facilitated the transfer of special courses (such as an honors biology course) into the university curriculum.

These basic criteria were essential to our success:

- Encouraging communication between community college and university faculty is one of the best results of this initiative. These direct contacts between the institutions are invaluable to helping resolve student issues and enhance the curriculum of both institutions. This is a win-win for faculty and students.
- Assessment of transfer students should involve more than multiple choice questions. The QC workshops have informed faculty of alternatives to multiple choice assessments, and we are hopeful these will be incorporated into the common assessment instrument we are now perfecting.

In order to keep these efforts sustainable, we also discovered we needed to overcome the following challenges:

- Participating faculty members must find enough time to accomplish goals and coordinate schedules.
- We must develop easy pathways for institutions to share relevant information on transfer students. Involving students in this process is key.
- We must find the funding to continue the initiatives we have started. For example, the KCTCS summer workshop can be funded by individual colleges without requiring a registration fee, but the funding for travel and lodging is paid by either the colleges or out of the pockets of faculty.