Support of cohesive curricula on CU Boulder Campus

A position paper by the facilitators and participants of the Curricular Alignment Special Interest Group: Stephanie Chasteen (Center for STEM Learning, TRESTLE), Amanda McAndrew (ASSETT), Teresa Foley (Integrative Physiology), Janet Casagrand (Integrative Physiology), Andrew Martin (Ecology and Evolutionary Biology), Sarah Sokhey (Political Science), and Lisa Dilling (Environmental Studies).
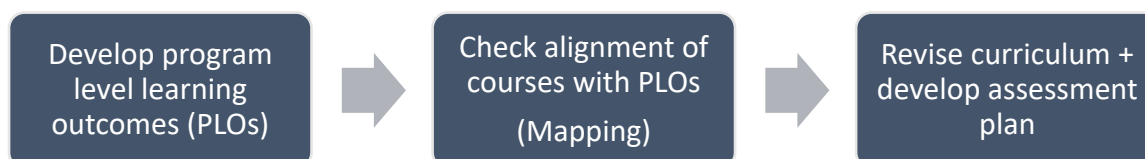
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About this position paper:

The discussion in this short paper is based on the experience of 5 faculty and instructors in 4 departments at the University of Colorado who participated in a 2-semester Special Interest Group on *Aligning Courses and Goals for the Major,* co-facilitated by Stephanie Chasteen and Amanda McAndrew.

Statement of need for support of curricular alignment:

During the past decade, CU Boulder has concentrated many efforts and resources on supporting faculty to reform their undergraduate courses using learning goals and evidence-based teaching practices. One major initiative was the Science Education Initiative, a $5M five-year program to provide resources to departments in the form of postdoctoral fellows who collaborated with faculty to identify the key goals for their courses and alignment of instructions and assessments with those goals (i.e., "backwards design"). The lessons-learned from this initiative are outlined in the *Science Education Initiative Handbook* (free and online) and in *Improving How Universities Teach Science* (Wieman, 2017).

As the culture at the university has slowly transformed to embrace teaching practices based on backwards design frameworks, Chasteen has seen a growing need and interest in using backwards design at the program level. More programs are undertaking *curricular alignment* projects, to enhance the deliberate cohesiveness and efficiency of a major; program level learning goals are developed and the existing curriculum is mapped to those goals. This curricular mapping process then drives the development of a program-level assessment plan, and of changes to the curriculum itself; see figure below.

Develop program level learning outcomes (PLOs) → Check alignment of courses with PLOs (Mapping) → Revise curriculum + develop assessment plan

Curricular alignment is a valuable activity for departments and programs because it:

1. Creates a more cohesive major.
2. Allows for a more intentionally designed major, rather than "business as usual."
3. Allows elimination of redundancies in the curriculum, resulting in efficiencies.
4. Allows identification of gaps in the curriculum, creating a clearer argument for any new courses.
5. Leverages required assessment processes (e.g., ARPAC) to be more valuable to the program.
6. Ultimately, better prepares students for their future careers.

In our TRESTLE/ASSETT Special Interest Group, the participants and their departments were in varying stages of development of curricular alignment, from initial exploration, to identifying program level learning goals, to garnering departmental support for the process. Their individual experiences can be read on our TRESTLE Scholars public webpage. Across these diverse individuals, we identify the following needs around curricular alignment which we feel ought to be supported by the university:

The university needs to *inform* faculty and departments about curricular alignment.

Participants in this group took time to orient to the difference between *course level learning goals*, and *program-level learning outcomes*. The university will need to develop position statements on the difference between these, and to what degree programs and courses are expected to develop these items. Then, professional development to develop goals and map the curriculum to them is needed.

The university needs to *incentivize faculty and programs* to engage in curricular alignment.

A curricular alignment project takes a lot of time. Most participants found it took more time than expected, they only began the process. Many programs are not yet ready to prioritize this work, and are not sure whether it is a priority at the university level. For a faculty member motivated to improve the program for students, this effort is out of the scope of the expectations of service; summer salary or course release is appropriate. It is also an effort which requires engagement from the full department, and thus needs a stamp of approval and concrete support from administrators. One participant specifically used the ARPAC review process as a way to push the department to work on curricular alignment. Another participant reflected:

> *My experience in trying to experiment with new teaching tools, make revisions, or even evaluate teaching differently is that it is driven by the individual effort of the faculty member, is very difficult and needs a lot of trial and error, and is not rewarded by the structure of the tenure system. So, in a world of finite time, revising classes and curricula is glacially slow because people are trying to do things on their own. When they don't work the first time, it can be very discouraging because we only have so much time, and it's unclear how much curriculum revision is valued at the university and in promotion processes.*

The university needs to provide *human resources*.

Developing program level learning goals and mapping them to courses takes a lot of time on the part of busy faculty. One faculty member had a graduate research assistant supporting the departmental work at just 5 hours per week, and found that this support made the difference in actually completing the work. This student gathered syllabi and learning goals, organized focus groups, and initiated the work of mapping. Another human resource which can be very valuable is that of experts; neutral expert facilitators and program developers who can help a program develop goals and map the curriculum. And

when courses need to be redesigned or newly developed, instructional designers (such as those in ASSETT) to work with faculty members to develop goals and instructional techniques are very valuable.

The university needs to provide *intellectual resources.*

Departments currently start from scratch in developing their approach to curricular alignment, and a matrix to map courses to goals. Starting from examples or blank templates is much more efficient. Resources requested include:

1. Blank curriculum mapping matrices
2. Example program level learning outcomes at the university
3. Examples of multiple measures at the program level
4. A university web page dedicated to curricular alignment which defines terms, identifies the process of undertaking a mapping, provides blank templates for the process, offers the help of professionals, and documents lessons learned from other programs.

We believe that curricular alignment is a process that has great potential value for CU Boulder, and encourage the institution to better support programs in undertaking this task.

Sincerely,

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