Work in Progress - A Provisional Competency Assessment System

Mark Somerville, Debbie Chachra, Jonathan Chambers, Ellen Cooney, Kristen Dorsey, John B. Geddes, Gill Pratt, Kathryn Rivard, Ann Schaffner, Lynn Andrea Stein, Jonathan Stolk, Stephen Westwood, and Yevgeniya Zastavker
Franklin W. Olin College of Engineering, Needham MA 02492 mark.somerville@olin.edu

Abstract - Over the last two years Olin College has been defining and implementing a provisional system to develop and assess student competency levels. The system particularly emphasizes the importance of creating a community of practice that includes not only faculty but also staff and students. In this paper we provide an overview of the design process, and comment on the results of our first year of implementing the system.

Index Terms – competency assessment, curriculum design, outcomes assessment

INTRODUCTION
As a part of its 2003-4 curriculum revision process, Olin College decided to implement direct mechanisms for competency assessment both inside and outside the classroom. During the following summer, a team of faculty, staff, and students reviewed best practices in this area [1]-[5], and engaged in a user-centered design process that led to the development of a competency assessment plan. This paper describes some aspects of the design process, gives an overview of the workings of the system, and discusses the results of our first year of implementation.

DESIGN PROCESS
Our design process was very intentional, to the extent that specific time and space were set aside for background research, ideation, refinement, and comparison of alternatives. The design team reviewed best practices, not to identify existing solutions that could be “transplanted”, but rather to deepen our understanding of possibilities within the design space, so that ideation could be well-informed.

Much of the design effort focused on identifying alternatives and refining those alternatives through a user-centered perspective. This was a critical step, for curricular systems often stand or fall on their intrinsic merits, but on the attitudes of users and their daily interactions with the system. For example, the team spent significant time interviewing users (faculty, students, and external constituents) and developing personas of these users to help capture their concerns and values. Alternatives were then tested against these personas. By explicitly asking how personas would react to a given feature/requirement, we were much better able to identify and respond to difficulties in the system.

This approach allowed us to identify the specific objectives of the system, together with the relationships between these objectives. Four interrelated objectives were identified: i) Assist in addressing accreditation requirements; (ii) Facilitate curricular improvement; iii) Improve student learning; and (iv) Help Olin to differentiate its programs and students from others.

Just as importantly, this approach concretely identified the values and philosophical underpinnings of the system. Major considerations here included an emphasis on the system’s cost-to-value ratio, and the need for the system to be developmental (in the educational sense). Perhaps most important was the desire for the system to create a community of practice around competency development, and to evolve over time as that community matures.

Finally, as a starting point, the design team identified nine competencies: qualitative analysis, quantitative analysis, design, diagnosis, teamwork, communication, opportunity assessment and development, understanding of context, and lifelong learning. It is important to stress that these competencies are “initial conditions,” and they are expected to change over time as the community comes to understand them better.

SYSTEM OVERVIEW
Figures 1 and 2 illustrate overviews of the system from the perspective of an individual student and of the institution, respectively. Major features of the system include:

- Ongoing student creation of reflective portfolios. On a regular basis, students identify pieces of work that illustrate their intellectual development and place them in an electronic portfolio. Each selection is accompanied by self-reflection on how the work addresses specific competencies. Teaching faculty, advisers, and a
Competency Certification Committee will regularly review portions of the portfolios.

- Course-based competency assessments. Within each course, faculty members assess student achievement in relevant competencies. This is planned to occur within every course in the curriculum.
- Competency assessment outside of courses. At the end of each semester (twice a year), all students at Olin present work to peers, faculty, and external visitors at the Olin Exposition, a two- to three-day event. The presentation formats include brief conference-style talks, posters, and demonstrations. This event brings 50-100 external assessors to campus; they assess student work with respect to competencies, and provide students with feedback on their performance.
- The creation of a competency record that tracks student development in the competencies. Students and their advisers are aware of students’ competency development throughout their time at Olin and can determine which competencies might require additional attention.
- A competency certification process as part of the graduation requirement. Portfolios and competency records will be used to determine students’ final levels of competency attainment. It is intended that these final levels of attainment will be reported on the transcript.
- Clearly articulated pathways for institutional feedback. The institution reviews samples of student work in an annual curriculum retreat and evaluates the curriculum and competency rubrics in the context of this work. Recommendations for changes to the curriculum or the competencies are then made.

Preliminary Results and Future Plans

The system outlined above has been in operation for the last year. The college has held one curriculum retreat to examine the competencies and the system. Based on our experiences to date, we can identify a number of areas of success and areas for future work.

As a result of the distributed nature of the competency system, members of the Olin community are generally quite familiar with the competencies, and have informed opinions about assessment and how it might vary by competency. At the first competencies-focused curriculum retreat, it was possible to have very concrete and worthwhile discussions around improving or changing the competency definitions.

This level of productivity was only possible because the people engaging in the discussion had already tried (and in some cases failed) to assess a given competency.

It is particularly worth noting that students are engaged in this discussion as well. Students are explicitly assessed against the competencies, they must learn to identify competencies in their own work, and they are asked to assess other students’ work through the lens of competency development. As a result, students have developed an impressive knowledge of the competencies. From an educational perspective, such awareness is clearly desirable.

The system has also helped Olin obtain a distributed mapping of outcomes within the curriculum. Thus, Olin is aware of almost every experience within the curriculum where, for example, communication is developed.

The Olin Exposition has been a significant success as well, both from a student learning perspective and from an assessment perspective. Students develop their ability to present and defend their work in an authentic setting, and are generally excited to participate in the event, largely because of the large number of external visitors involved. From an institutional perspective, it is very helpful to have these guests reflect on the extent to which students are demonstrating the competencies Olin intends to develop, and on how those competencies may map onto the skills employers desire.

Although keeping the value-to-cost ratio high was a major consideration in the design, some aspects of the system clearly require revision in order better to address this concern. In particular, the system’s original implementation of the reflective portfolio system has proved difficult to implement and difficult to enforce, due to resource constraints. We are currently exploring technological approaches to help address this issue, but it is possible that this aspect of the system may require further consideration.

Transient effects related to the implementation of the system are also an issue. As much as we have been relatively successful in creating a community of practice, students and faculty are still not completely unified in their understanding of the system or its consequences. Building this common understanding will be a major undertaking over the next five years.

References