Report of the Ten-Year Review Committee
for the
Department of Human Centered Design and Engineering

July 14, 2017

Summary

The overall conclusion of the review committee is that the department of *Human Centered Design and Engineering (HCDE)* has a strong internal and external reputation. The discussions with and investigations of the department in the context of the external review have shown it to be harmonious, collegial, and committed to interdisciplinary study. HCDE serves as a hub for research that connects many disciplines at UW as evidenced by its collaborations with other units on campus. We therefore recommend that the department be approved for a full ten years till the next review will take place.

However, as previously identified in the 2006-7 review, we also found that the department's disciplinary identity and direction and its position within the College of Engineering could use a sharpened focus and more careful articulation. For this reason, we also recommend that the department conduct a strategic planning process and present an interim report in no more than four years.

In this report, we (1) describe particular areas of ***strength*** for the department, (2) note a number of ***concerns***, and (3) make **recommendations** about how these concerns might be addressed.

Strengths

Spirit of Collaboration and Collegiality

Across the department, administration, staff, permanent faculty, full time lecturers, and part-time instructors all asserted and exhibited a strong sense of community and collegiality, as well as commitment to and enthusiasm for their subject area. This was further evidenced by a largely non-hierarchical internal structure and a broadly collaborative approach to governance and teaching.

Student Demand and Enrollment Growth

The demand for HCDE courses is high and department's enrollments have increased significantly in the last ten years. Driven by the broader US turn to high-tech development, their knowledge, skills, and graduates are in high demand, a trend seems likely to continue. In this sense, they service a growing need in the industry. Whether they can or should continue to scale up enrollment remains one of the challenging questions. Students commented that they liked the program because of its "collaborative" feel, and this could be more difficult to maintain as the student population grows.

Student Attachment to Program

The students we met with (which did not include certificate students) largely share the faculty's interest and enthusiasm for the department, though there are somewhat divergent notions regarding the direction of further development. Student demographics reflect a subject appeal that crosses ethnic and gender lines in ways that many engineering departments aspire to.

The department administration is committed to the success of their students, engages closely with them at all levels in the program, and has recently added staff to assist with advising.

Faculty Scholarship

Individual faculty members in the department are very productive in terms of scholarly output, and in terms of Best Paper awards, student scholarships, and NSF CAREER awards (seven). Given the strength of HCDE within the university and college, the department's stated goal of a "national leadership role" seems achievable. Strong representation at national and international research conferences already supports this goal.

Successful Transition from Technical Communication (TC) to Human Centered Design and Engineering (HCDE)

The TC to HCDE transition has been well managed and accepted by all players, including faculty and students who predate the transition. We spoke with senior faculty, whose tenure predates the transition, and with a few graduates from the TC program. All seem to embrace the change in the department's focus. In particular, faculty participate fully in the reformulated curriculum. Given the magnitude of the transition, we consider this a surprising positive.

Faculty Support by the Department

Across the department, junior and senior faculty receive support for conference travel, and research development in the form of grant and contract support. While their teaching load is the same as that for tenured faculty, new assistant professors receive enough startup funding to buy out of one or more courses in their first year, allowing them to focus on starting their research program, and are assigned a mentor from the current faculty to help them navigate the institution and their career.

Concerns

Space

The most critical limitation for future growth in quality and size for the HCDE department is space. During our visit we heard from all constituencies (students, former students, junior faculty, senior faculty, part-time faculty, staff, and administration) that the department is space constrained, both in quality and quantity. Courses are scheduled all across campus. Even when space may be available within Sieg Hall some faculty prefer to teach elsewhere because the spaces do not suit their teaching style, which is often collaborative and participatory rather than hierarchical and expository. Only one space includes facilities suitable for prototyping and active learning, a serious lack in a program with a strong design focus. PhD students must share limited seats and research space, and all students experience limited opportunities for informal interaction with peers and faculty.

The department does use the generous hallways of Sieg Hall as informal meeting space and does have a student lounge, but a recent faculty search appears to have stalled, at least in part due to limited space available for research the prospective faculty member wanted to do.

Identity

The drive, enthusiasm, and specializations in HCDE revolve around and emerge from the expanding universe of digital technology and the growing realization of the multiple ways in which this technology impinges on human activity at work, play, and school. The subject is both old and new, touching older disciplines of sociology, computer science, product design, human factors research, and even electrical engineering, making interdisciplinary studies appropriate and interdisciplinary connections fruitful.

The situation means there is a need to identify clearly what the HCDE faculty means by each of the words in the department's name, as well as their connection to disciplinary neighbors. How much of which technologies? What methodologies? What taxonomies and epistemologies? These boundaries are both opportunities for collaboration and delineations of the department.

Strategic Planning

Nearly everyone we spoke to felt the need for strategic planning. Faculty said, "We need a long term vision" while recognizing that there might be some "contention" over directions. One faculty member said, "How much do we look like HCI?" Others asked, "Do we want to look more like an

engineering department, and if so, how?" What is the difference between HCDE, i-schools, and CS? PhD students said, "Broad is the theme," something of a double-edged sword. When asked rather pointedly by us what the program is about, one administrator replied, "putting people first," "understanding human needs," and "humans and technology."

Such statements do not distinguish HCDE from the other types of programs such as HCI. Faculty members said, "figure out humans" and "how they think and behave" and that design is a "heterogeneous tossed salad," a space "with a lot of wiggle room." The strategic planning process can help hone these perhaps overly broad concepts to form a distinctive identity and clear intellectual emphases for HCDE. For example, some faculty mentioned critical design, a potential direction that could bring faculty strengths to the fore and offer prospective students a valuable choice. There seemed to be a sense that "user-centered design," a traditional HCI perspective, was being "reworked" although just how is not clear. Some mentioned that they desired a greater engineering focus with a lot of building. However, many programs are strong in engineering/building so if the department wants a unique identity, rather than being part of a cluster (which would not be a bad thing but should be decided upon), this could be discussed as part of strategic planning.

Curriculum

Another area of concern, and a strong indication of the need for strategic reflection, is the broadly acknowledged thirst for both more "design" content and more "technical" content in the curriculum. Some Master students felt they had "few opportunities to expand design skills" and desired "more classes in design." The two broad thematic areas of research and design were sometimes hard to navigate. They mentioned that the existing design classes could be "more rigorous" and that there are "no advanced design courses." These perceptions may of course not be exactly right, but they reflect some student confusions and anxieties. Some felt engineering is "not represented" and wanted more opportunities to "write code." They said they design "prototypes of apps" and wanted to move on to bigger systems, or "meaty projects, real-world projects," as one student said. Another PhD student spoke of the need to "put some boundaries" on interdisciplinarity.

An alum who is now a hiring manager said the students from the HCDE program he interviews had a "cookie cutter" feel like General Assembly. (We met separately with alums of the masters program.) He compared them unfavorably to CMU students who he felt had a "critical edge" and did not seem to be products of the "same instructors, same projects" as the HCDE students did. One alum had concerns about lack of accountability in group projects. He felt students did not

"get as good a grasp on your own strengths" and students did not experiment with different roles but did what they were already good at, to some extent weakening a potential positive of group projects. "80% [group work] is too much," one alum said.

The alums mentioned the importance and desirability of tenure track faculty for the classes, saying that outside professionals "being dropped in a quarter at time is not the greatest." Current masters students and alums felt a lack of focus and depth. One alum described the situation as "masters in jack of all trades" and a part-time faculty member said "master of none." Another alum said there is "no level-two class in anything" if you wanted to go deeper into "something that might interest you." These issues could impact the future of the program which is reaching out to areas such as the Bay Area for students as there are fewer locals applying (perhaps from saturation) as the Administrative Staff pointed out. The alums were very positive about how the program encourages students to continue to be active in professional groups after graduation and in keeping links to academe. They felt there was an especially good foundation in "process" in carrying out projects from start to finish.

There was considerable concern about some of the industry-led courses in terms of getting feedback on work and reliance on group work at the cost of individual critique. One person said you could "get through by sitting back" and students mentioned lack of accountability in group projects. Too many guest speakers, brought in by industry-based faculty, were also mentioned as a negative. Group reading sessions were criticized as "reading workshops" without a lot of value. Some student observations suggest that an over-reliance on mechanics of grading (rubrics) and lack of more thoughtful feedback erode quality. "My wireframes were crap [but I didn't get feedback saying so]," said one masters student who was given a good grade for what they regarded as bad work. Tenure track faculty instructors were valued in the Master program and students wanted more classes and contact with them. As the program grows, such concerns become more pronounced.

Part-time faculty mentioned group work at the undergraduate level, saying that students "default into their strength" in the capstone project, missing "an opportunity for growth." One said that individual work "freaks them out but it's fantastic." Individual projects create more competition, which the faculty member felt was a positive. Issues around group work are hardly unique to HCDE but they were mentioned a lot in different contexts and bear on future planning as the program grows and it becomes more difficult to deal with them.

Another concern is a tension between procedural and reflective content—learning "why" as well as "how." While the department's name invokes both design and engineering, whether a

bachelors or masters level program can deliver the full breadth of content in the time available is a question the department needs to consider. For example, the alum that is a hiring manager noted that students are not being taught “how to form an opinion.” He used the example of *personas*, which students are familiar with but which they don’t understand at a deeper conceptual level, e.g., why you would use them and in what circumstances.

Considering these questions, the department will almost certainly wrestle with the balance between interdisciplinary and disciplinary content, of sequencing and access to courses offered outside the department vs. time spent developing and offering HCDE versions of the same content, and organizing the “grab bag” of courses currently on offer (mentioned by masters students) into sequences that develop in a meaningful and coherent way.

Communication

Our final concern relates to administrative communication within the department. While the formal academic communication (course-level faculty-student communications) appears quite strong, as does communication within the core administration and from the administration to faculty and students, there seem to be weakness in the communications from the students to the administration, and from the part-time faculty to the administration. Both students and faculty reflected uncertainty about when and how to provide input or feedback to the department administration, even though the administration has established procedures and opportunities for doing so, such as quarterly faculty dinners.

In spite of added advising staff students commented on long lead times and limited numbers of advising appointments. PhD students mentioned lack of “transparency”---they are not sure who to turn to with feedback about the program, as well as concerns about which courses they can take for which credits, in which departments. The latter reflects the many options open to them, while at the same time creating some confusion. Masters students also mentioned confusion about courses, e.g., they could take a course outside the department but ended up not not getting credit, or only elective credit. They felt it depended on which school the course was offered in, but the situation was overall confusing.

Junior faculty members mentioned that it would be desirable to meet more often with their mentors, a process that the faculty member must initiate rather than having a more structured program in place. It was also felt that the service load is rather high for junior faculty and that there is pressure to take on new students, but a lack of time and space.

Some of the communication issues may simply be due to increased size of both populations of individuals as the department has grown and a resulting decline in informal (“watercooler”) opportunities to interact. We recommend that the administration experiment with alternative strategies for accepting input, such as a representative committee of students, alternative meeting times for small groups of evening-program instructors, and social media communication mechanisms, and that information on courses be offered in a systematic way, or at least in a way that appears more systematic to the students. The upcoming strategic planning process, like this ten-year review, offers additional opportunities to share ideas and solicit input.

Recommendations

Next Review and Interim Report

We recommend that the department be approved for a full 10 years till the next review will take place.

To encourage the department to address the concerns outlined above, and encourage the University to take actions supporting the department (specifically addressing the space issue), we recommend that *an interim report* be created in four years. This report should reflect the changes in space-allocation we are led to anticipate, and assess whether they meet the current deficit, and it should provide a clear strategic vision for the department, with a distinctive intellectual identity.

Addressing the Space Needs of the Department

Space is a serious limiting factor for the department. Space is required:

- at multiple scales, from office space for PhDs and staff to lab space for research, to teaching space (studios or flexible, rearrangeable space with white boards, white tables, and equipment) that supports faculty teaching styles.
- in support of collaboration opportunities with other faculty and departments elsewhere.
- the current situation has resulted in (a) a stalled search, (b) limited informal interaction amongst students, (c) hurdles to use of preferred teaching styles, (d) course timing.

As articulated and promised by the Dean of the College of Engineering during the exit interview, the University will address the space limitations and the current situation will change in the next two to three years, when the new CSE building comes online. The availability of additional space is likely to have a substantial impact on teaching and research within HCDE.

Need for a Strategic Planning Process

In light of the decade of rapid program growth, the change in focus, and the evolving disciplinary situation, it is of critical importance that the department conduct a careful strategic planning exercise as soon as possible, though the changing space allocation situation may warrant delay until that situation is clarified.

This **strategic planning process should include:**

- The development of a *long term vision* while taking into account that there might be some “contention” over directions.
- The creation of an *identity and clear intellectual emphases* for HCDE by articulating the similarities and differences to i-schools, informatics departments, computer science, engineering departments, and the field of human-computer interaction. We suggest that relevant statements need to be more articulate than the current descriptions used by HCDE such as: “putting people first,” “understanding human needs,” and “humans and technology” which are very important objectives, but need to be further refined to distinguish HCDE from the other types of programs and approaches. We imagine this will require considerable departmental discussion and soul-searching.
- The establishment of a *visiting scholars program* to connect with senior members of the research community centered around HCDE. Such a program should simultaneously broaden the local program and expose visitors to the strengths and spirit of the HDCE department.

The enhanced communication and focus of a well-conducted strategic planning cycle may well resolve a number of our concerns in itself, but it will also help the department to take conscious control of its future and leverage the energy and excellence of the students and faculty already involved in the present.

Prof. James Coupe
UW Center for Digital Arts and Experimental Media
University of Washington

Prof. Gerhard Fischer
Computer Science
University of Colorado at Boulder

Prof. Brian Johnson (chair)
Architecture
University of Washington

Prof. Bonnie Nardi
Informatics
University of California, Irvine