OIPP Evaluation Roadmap

Executive Summary

This document provides a roadmap for the evaluation of the UC Online Instruction Pilot Project (OIPP) during its first phase. It focuses on the following key research questions:

• To what extent does the organizational structure and approach to the OIPP support faculty and staff in the development of high-quality online courses?
• In what ways will faculty use the capabilities of online courses to enhance the learning experiences and academic outcomes of students, and how do these approaches affect the nature of learning interactions (student-content, student-student, faculty-content, student-faculty, etc.) as well as learning outcomes?
• In what ways do these technological innovations and changes in pedagogy change the workload characteristics for faculty and TAs?
• How do online approaches to education perform relative to more traditional approaches with the same function across multiple educational outcomes (i.e., content, problem solving) and domains (i.e., cognitive and affective)?
• Do the principles for universal design for learning increase outcomes for all students and/or decrease the variation in student outcomes by allowing for multiple modes to deliver, acquire, and demonstrate content and learning?
• To what degree do demonstrated benefits accrue to course development supported system-wide, rather than on a campus-by-campus, faculty-by-faculty basis?

The evaluation adopts a two-tiered strategy that assesses OIPP goals and performance identifying both the organization and course as critical units of analysis. Of the two, the organizational level is the most clearly defined since its form and structure are already established. Opportunities at the course level are necessarily guided by the specifics of the courses themselves and take account of their learning objectives, discipline-specific instructional models, uses of online tools and approaches, and institutional contexts (Boshuizen, et al., 2008). These course designs are not yet fully fleshed out and have not yet been compared across the program, thus the nature of the course-level evaluation is currently under development.

At the organization level, the evaluation focuses on the extent to which the project:

• shapes stakeholder opinion about and willingness to engage in online undergraduate instruction (including the opinion of faculty who are developing courses for the project);
• leverages the distributed expertise and infrastructure that exists across the university in the development of capacity that is able to act coherently system-wide (development of the common learning environment, integration of campus instructional design, and course production support will be key foci for the evaluation); and
• facilitates campus-level course approval, student enrollment, collaboration among campus registrars, and departmental budgeting regimes in order to foster and facilitate cross-campus instruction of UC students.

This evaluation will also look at the multiple organizational structures that exist across campuses and
their implications for a university project of this nature.

**At the course level** there are two different types of analysis that will be conducted. First, within key courses we will evaluate the functioning of the course relative to the processes hypothesized by the faculty teaching the course. For example, we will examine the degree to which online educational tools facilitated the achievement of student learning objectives and affected faculty/TA roles and whether these outcomes occurred in a manner consistent with the ways in which the online tools were anticipated to work (i.e., through increased engagement with course content or better allocation of assistance to struggling students). Second, across courses we will examine the degree to which particular pedagogical techniques, disciplines, or student populations are particularly affected by interaction in the online learning environment.

A key programmatic question that can be addressed through the OIPP evaluation examines the faculty-led design process of OIPP courses which has been central to program development. This principle has been held as essential because it ensures that the OIPP courses primarily reflect faculty-specified learning objectives rather than the capabilities of an existing learning management system (LMS). In this regard, the OIPP tests how to support world-class faculty in creating successful courses that are optimally effective. The faculty-led design process also creates significant opportunities for the evaluation because of the diversity of approach that it fosters.

If the research suggests that the innovations appear to have a positive impact on students’ learning outcomes, UC will be seeking to make online instruction a permanent part of the undergraduate experience, ensuring that the benefits will be passed on to subsequent faculty and students. Ultimately the lasting value of the OIPP evaluation may be as much in the research generated by the project as in the impact on UC’s decisions about their investment in the online arena.

Finally, this roadmap is intentionally designed as a living document. In its present form, it captures the scope of our current ambition but is expected to evolve to reflect:

- opportunities that emerge as individual courses are fully designed;
- the capabilities of the common learning environment once developed;
- discussion with key stakeholders; and
- available funding.

Accordingly, our intention is to update the roadmap periodically and have it available (along with any interim and full reports) on the OIPP website.
1. Introduction

UC Online Instruction Pilot Project (OIPP) will deliver online high-enrollment, lower-division, major-gateway courses and general education courses to UC students for degree credit and to non-UC students for transferable credit. The project will be conducted in two overlapping phases. Phase 1 (6/2011 - 9/2013) creates and delivers to UC undergraduates up to 40 courses, while building out the academic, technical, student service, and business and administrative infrastructures required to transition to a financially self-sustaining operation. Phase 2, beginning 9/2012, opens online courses to non-UC students on an open enrollment revenue-generating basis and builds both course offerings and student enrollment annually. Both Phase 1 and Phase 2 include a strong evaluation component embedded in the coursework and designed to achieve two goals:

- collect crucial data that will help illustrate how, whether, to what extent, and at what cost online education can be integrated effectively into the undergraduate curriculum of an elite research university.
- shed light on how students learn online and support the continuous improvement of content, tools, and approaches that support student success.

The data collected by this evaluation are both timely and essential. Currently, greater attention is being paid nationally to online instruction in selective universities and colleges, yet its effectiveness as a teaching method in these institutions is not well researched. For example, the frequently cited 2010 Department of Education meta-analysis “Evaluation of Evidence-Based Practices in Online Learning” that espouses the success of online instruction includes only a few fully online semester-length college courses and the conclusions reached may not be pertinent to top-level instruction (Jaggers & Bailey, 2010). A recent UC Academic Senate special committee reviewing online instruction concluded that no more than five of the 46 studies cited in that analysis were conducted for large-enrollment lower-division classes (UC Academic Senate, 2010). Existing research tends to focus narrowly on the effectiveness of a particular course in a specific institutional context (e.g., research at Carnegie Mellon University and by ITHAKA Harbors). Given this relatively early stage in the online learning arena, we currently lack the data to assess the effectiveness of online instruction across different disciplines, levels of instruction, and with different student populations. Further, limited data exist to enable comparison of different online approaches to common learning outcomes. For example, it remains virtually impossible to conclude whether online instruction can be more or less effective when using secure high-stakes student assessments versus more project-based low-stakes approaches or the degree to which online opportunities are accessed by students. Given OIPP’s scope and design, it serves as an ideal test-bed for these essential analyses.

This document provides a roadmap for the evaluation of the OIPP during its first phase. It focuses on the following key research questions:

- To what extent does the organizational structure and approach to the OIPP support faculty and staff in the development of high-quality online courses?
- In what ways will faculty use the capabilities of online courses to enhance the learning experiences and academic outcomes of students, and how do these approaches affect the nature of learning interactions (student-content, student-student, faculty-content, student-faculty, etc.) as well as learning outcomes?
- In what ways do these technological innovations and changes in pedagogy change the
workload characteristics for faculty and TAs?

• How do online approaches to education perform relative to more traditional approaches with the same function across multiple educational outcomes (i.e., content, problem solving) and domains (i.e., cognitive and affective)?

• Do the principles for universal design for learning increase outcomes for all students and/or decrease the variation in student outcomes by allowing for multiple modes to deliver, acquire, and demonstrate content and learning?

• To what degree do demonstrated benefits accrue to course development supported system-wide, rather than on a campus-by-campus, faculty-by-faculty basis?

By addressing these questions directly with data derived from the online instruction delivered at scale and across the wide range of disciplines included in the OIPP, the research will inform the development and implementation of other online courses in the UC and at universities nationally. It will also shed light on issues of national significance including the ability of online education to:

• expand access beyond that which bricks-and-mortar infrastructure can allow;

• promote affordability by finding the most economically effective means for delivering high-quality, credit-bearing instruction and expanding pathways for transfer from the state’s community college system;

• extend academic quality and enhance student success (particularly for students from low-income and under-served populations) through technology innovation; and

• respond to students’ growing facility with a wide range of social networking and other digital technologies that engage them actively in the learning process (NSF Task Force on Cyberlearning, 2008). Such interaction helps to cultivate a citizenry that engages productively in learning not only within its own local communities but broadly with the nation and the world.

2. Evaluation Strategy

The evaluation adopts a two-tiered strategy that assesses OIPP goals and performance identifying both the organization and course as critical units of analysis. Of the two, the organizational level is the most clearly defined since its form and structure are already established. Opportunities at the course level are necessarily guided by the specifics of the courses themselves and take account of their learning objectives, discipline-specific instructional models, uses of online tools and approaches, and institutional contexts (Boshuizen, et al., 2008). These course designs are not yet fully fleshed out and have not yet been compared across the program, thus the nature of the course-level evaluation is currently under development.

2.1. At the organization level, the evaluation focuses on the extent to which the project:

• shapes stakeholder opinion about and willingness to engage in online undergraduate instruction (including the opinion of faculty who are developing courses for the project);

• leverages the distributed expertise and infrastructure that exists across the university in the development of capacity that is able to act coherently system-wide (development of the common learning environment, integration of campus instructional design, and course
production support will be key foci for the evaluation); and
- facilitates campus-level course approval, student enrollment, collaboration among campus registrars, and departmental budgeting regimes in order to foster and facilitate cross-campus instruction of UC students.

This evaluation will also look at the multiple organizational structures that exist across campuses and their implications for a university project of this nature.

2.2. **At the course level** there are two different types of analysis that will be conducted. First, within key courses we will evaluate the functioning of the course relative to the processes hypothesized by the faculty teaching the course. For example, we will examine the degree to which online educational tools facilitated the achievement of student learning objectives and affected faculty/TA roles and whether these outcomes occurred in a manner consistent with the ways in which the online tools were anticipated to work (i.e., through increased engagement with course content or better allocation of assistance to struggling students). Second, across courses we will examine the degree to which particular pedagogical techniques, disciplines, or student populations are particularly affected by interaction in the online learning environment.

More specifically, individual OIPP courses may be evaluated on:

- the educational effectiveness of online instruction to achieve student learning objectives;
- the extent and nature of student and faculty engagement;
- instructor workload both in course development and delivery;
- student workload; and
- overall course development and delivery costs.

In addition, given the project’s structure (most of its courses will be run side-by-side or grow out of extant on-ground, classroom-based courses), the course-level evaluation will support between course analysis. Its scope will also enable assessment of the effectiveness of online instruction:

- across disciplines (sciences, arts, humanities);
- across levels of instruction (developmental, introduction survey courses, specialized upper-division courses); and
- across different student populations (giving specific attention to academically at risk students).

Finally, a key programmatic question that can be addressed through the OIPP evaluation examines the faculty-led design process of OIPP courses which has been central to program development. This principle has been held as essential because it ensures that the OIPP courses primarily reflect faculty-specified learning objectives rather than the capabilities of an existing learning management system (LMS). In this regard, the OIPP tests how to support world-class faculty in creating successful courses that are optimally effective. The faculty-led design process also creates significant opportunities for the evaluation because of the diversity of approach that it fosters. In an initial survey of detailed course designs that have been prepared by project faculty in consultation with project instructional designers, we see, for example, multiple approaches to low- and high-stakes assessment, student engagement, and innovations in small group seminar discussions. In some cases,
individual faculty are self-consciously testing different mechanisms within the context of their course. For example, faculty designing a humanities course at Irvine is proposing to simultaneously run sections face-to-face, synchronously online, and potentially asynchronously online, all of which contribute to a rich environment for evaluation.

2.3. Evaluation Phasing

The evaluation will be conducted in two phases reflecting the project’s development trajectory. In the first phase—currently nearing completion—it gathers data on the planning process and prepares for the upcoming course implementations. This data will be critical in assessing the impact of the project’s organizational approach and also in gathering baseline data on the attitudes of key stakeholders towards online learning.

During this phase of the project, courses were selected for OIPP in a competitive peer-reviewed process from letters of intent that were invited from UC faculty. With professional guidance and support from technology and instructional specialists, faculty involved with the selected courses developed detailed course designs using a template that ensured a coherent approach across the project, e.g. to the specification of course-level learning objectives, assessment strategies, implementation plans, etc. In the process, the project encouraged faculty to adopt promising and innovative approaches, often sourcing information about these approaches from the faculty who are involved in the project as most have experience (some substantial) in online learning.

There have been several fundamental assumptions driving course design and evaluation that help provide consistency across courses and allow for evaluation of synergistic pedagogical elements across courses, expanding the evaluation beyond the level of individual courses. Examples of common assumptions underlying course development include:

- There will be a strong instructor presence in the course.
- Each course will include well-defined learning outcomes that identify the instructor goals for learning and provide some specific targets for assessment.
- Courses will be structured to facilitate student-student, student-instructor, and student-content engagement.
- Where feasible, typical summative assessments such as midterms, finals, term papers and projects will be supplemented by additional assessment methods enabled by the online environment.
- Where feasible, formative assessment monitoring student involvement and low-stakes (non-graded) performance will be used to provide feedback to both students and faculty to help guide teaching and learning.
- Courses will be supported by an evolving common but flexible learning environment providing a base set of functions and interface supplemented by add-ons that enable a variety of learning and assessment modes.
- Faculty and students will be supported with technical and educational help by various staff and service providers specifically aimed at the online environment.

Given these parameters it is clear that the project has emphasized the use of tools that support student engagement and student success. In addition, the OIPP has encouraged faculty wherever possible to adopt fully online asynchronous approaches in ways that allow for comparison with
synchronous online and on-ground (or face-to-face) ones, thus facilitating the evaluation of a key pedagogical question about online education, and allowing for estimates of the time and efficiency saving for fully asynchronous online courses versus hybrid designs.

The second phase of the evaluation will focus on the project as it moves into a full implementation phase—that is, as courses are developed and then offered to UC undergraduates for degree credit. It is at this stage that courses will be evaluated through a variety of theoretical and methodological perspectives to answer research questions regarding quality of instruction, educational effectiveness, student and faculty engagement, faculty workload, and delivery cost.

2.4. Potential Positive Spillover Effects

The intention of this project is to use existing best practices to leapfrog over the current model of online instruction and create a transformative paradigm that becomes a model for all of higher education. Accordingly, the research is designed to allow for potential spillover effects—that is, to examine areas where impacts could occur.

For faculty, the impacts of this research project could spillover in several ways. The online courses developed by this project could potentially serve as models for future course development and change the UC undergraduate curriculum either through the dissemination of discrete pedagogical techniques or through the sharing of increasingly scarce resources across campuses to expand educational opportunities for students. In addition, the faculty supported by the project in their course development efforts could be available to carry on the work for subsequent courses. In this way, a cohort of trained faculty will be able to facilitate the work of other faculty who follow. Secondarily, new online tools could be created at the course level (development work with faculty) and incorporated into the LMS which would leverage that work up to the system level, thus providing value-added for subsequent users of the system-wide LMS.

An additional spillover could simply be the lasting value of the OIPP evaluation independent of whether UC moves more or less aggressively into full online undergraduate instruction guided by the research produced through this evaluation. The data collected in this project will definitely have benefits far beyond this particular study. A trove of data will be available to faculty for future research and analysis. The research will add significantly to the body of knowledge on educational technology and learning. Given this possibility for broad effects, the design of this evaluation roadmap is broad enough to encompass that possibility, and specific enough to provide useful and actionable information for the project-specific decision making.

If the research suggests that the innovations appear to have a positive impact on students’ learning outcomes, UC will be seeking to make online instruction a permanent part of the undergraduate experience, ensuring that the benefits will be passed on to subsequent faculty and students.

3. The Organizational Evaluation Plan

The organizational evaluation plan was developed in December 2010 and put into implementation so as to enable both formative and summative assessment of the project’s effectiveness and impacts from its earliest stage. It focuses on the structure of OIPP and the degree to which it supports the
development and implementation of online courses. This comprehensive evaluation plan for OIPP has outcomes for several time horizons (1 year, 2 years, and 4 years) to account for possible changes in the project’s timeline, repeated course offerings, and tracking student’s performance in subsequent courses based on content covered in the online course.

The overall evaluation has three components (overlapping in time) as courses roll-out. Component 1 consists of a formative assessment of the organizational structure and processes of OIPP as well as piloting and validating student and faculty measures using the summer version of courses accepted into OIPP. In addition, the evaluation team, in cooperation with course faculty, will begin the process of developing logic models for key online components in each of the courses. Component 2 will consist of data collection and analysis on each of the developing OIPP courses rolled out during the 2011-2012 school year and continuing the logic model development as the courses are created. Component 3 will consist of creating and matching comparison groups for each of the OIPP courses on appropriate academic measures such as course grade, subsequent course taking patterns, and grades in subsequent related courses.

The evaluation of the organizational structure and implementation of the early stages of the OIPP is critical to the overall evaluation. The key innovation being attempted by the OIPP is not necessarily the introduction of online courses (UC already offers approximately 1,100 courses online to 55,000 students; 10% of these for university degree credit), but the planned introduction of these courses system-wide, including development of a common learning management system, course development support, and enrollment across campuses with different organizational structures. Understanding the degree to which this approach is viable is almost entirely contingent on the ability of the OIPP Online Management Group (OMG) to design and implement structures that expose and address systematic barriers to the success of this endeavor, including but not limited to addressing: different campus approaches to course approval/credit, different instructional support capacities available on each campus, unifying enrollment across multiple campuses for input into a single LMS, the design of an LMS that is compatible and acceptable across the system, and a lack of support by faculty and administration across the system. By understanding the degree to which these structural and implementation issues are addressed, the evaluation can provide guidance for future courses moving through the OIPP and frame the success or failure of current OIPP courses within the administrative support context available to them.

**Component 1: Formative Assessment/Validation of Measures**

Component 1 Goals:

- Provide critical information about the ways in which the Online Management Group’s (OMG) organizational structure provides the supports necessary for OIPP and the mechanisms by which OMG hears about problems that exist on the ground;
- Pilot surveys, interview protocols, time-logs, and data collection procedures for validity, process, and types of information gathered by the instruments; and
- Begin the process of creating logic models for each course as they are ready to roll-out.

In order to provide important formative information for the OMG group to make organizational decisions and the instructional designers (IDs)/information technologists (ITs) to optimize their work with the faculty and system integration, we propose this data collection protocol focus on
several specific questions answering the broader research question of, “To what extent does the organizational structure and approach to the OIPP support faculty and staff in the development of these courses?” The following questions are examples of the specific questions we are pursuing.

- What systems are in place for managing the different interests and expectations across the different organizational areas of UC Online (OMG, IDs, ITs, and Faculty)?
  - To what degree are these systems exposing differences among the groups and providing feedback to the leadership team for reallocation of resources/clarification of policies/practice?
- What is the level of engagement (measured by time allocated, self-identified interest, and meeting observations) among the different organizational areas of UC Online (OMG, IDs, ITs, and Faculty)?
  - What aspects of the pilot are most important to them?
- To what extent do the IDs, ITs, and Faculty feel supported by OMG?
- To what extent are the stakeholders (OMG, IDs, ITs, and Faculty) satisfied with the communication and their level of input/autonomy?
- Are the purposes, policies, and requirements established by the OMG about the pilot project being interpreted as anticipated by their intended audiences?

Each of these specific questions operationalize what it means to explore the broader research question about whether the organizational structure of OIPP is sufficient to meet the goals of the overall project. Within the context of these more specific questions we anticipate that several key areas will emerge as important for the OMG to consider as general areas of focus for the formative evaluation:

- Faculty autonomy versus “best practices” for online education. For example, to what degree should OMG and the IDs push particular practices, tools, and approaches to teaching on the online system?
- Where do UCOP and Faculty interests diverge and where are they consistent?
- What are the goals that emerge as most important for each group involved in OIPP and are there clear approaches for how the groups intend to reach those goals (logic models)?

**Component 2: Data Collection and Analysis**

In order to address the research questions above, data collection has been proceeding. The types of data and methods of collection necessary to answer the questions outlined above are described in Table 1. Interview and focus group data will be analyzed using standard qualitative techniques, specifically coding of the data around the key research questions described above, and then analysis of those themes, in this case using the NVivo software program. These themes will be triangulated

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1 Note: the data collection activities we are currently engaged in have been approved by the UCSB IRB and have been subject to the UC multi-campus IRB approval process. All future data collections will undergo a similar process, ensuring that all research will be conducted in accordance with IRB guidelines.
with analysis of survey, observational, and archival artifacts, to establish multiple points of references for particular findings. Finally, specific interpretations of interview or observational data will be member checked (shared with participants for validation of interpretation) and shared with peers (peer debriefing) to substantiate findings from these data (Lincoln & Guba, 1985; Miles & Huberman, 1999; Patton, 2002).
Table 1. Immediate Data Collection Strategy for Organizational Processes/Formative Evaluation

<table>
<thead>
<tr>
<th>Data Collection Methods</th>
<th>Data Sources</th>
<th>Purpose</th>
<th>Resources</th>
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</thead>
<tbody>
<tr>
<td>Interviews</td>
<td>• Faculty</td>
<td>• Gather baseline information about key interests, concerns, potentials, and problems</td>
<td>• UCEC staff travel to meetings</td>
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<td></td>
<td>• IDs</td>
<td>• Use that baseline data to develop a survey for ongoing monitoring of the course creation process</td>
<td>• Phone interviews</td>
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<td></td>
<td>• ITs</td>
<td>• Monitor communication between and among key groups involved in OIPP.</td>
<td>• Recording devices online</td>
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<td></td>
<td>• OMG</td>
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<tr>
<td>Focus groups</td>
<td>• Group Meetings (Writing group, ID meetings)</td>
<td>• Assess purpose and successes of meetings</td>
<td>• UCEC staff travel to meetings</td>
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<td></td>
<td></td>
<td>• Identify ongoing concerns to monitor</td>
<td>• Recording devices online</td>
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<td>Surveys</td>
<td>• Faculty (ongoing)</td>
<td>• Ongoing monitoring and to provide a quick way for Faculty/IDs/ITs to articulate new concerns or issues that might have arisen in the time between surveys or interviews</td>
<td>• UCSB Social Science Survey Center</td>
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<td>(Ongoing after initial interviews allow for design of survey protocol)</td>
<td>• IDs (ongoing)</td>
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<td></td>
<td>• ITs (ongoing)</td>
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<td></td>
<td>• Design of future surveys (student attrition, student engagement, student interest, etc.)</td>
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<tr>
<td>Archival Data</td>
<td>• Meeting Agendas</td>
<td>• Monitor different issues as they arise and map to concerns articulated by Faculty and IDs</td>
<td>• Implement a process for the collection and storage of archival data in accordance with IRB and Federal, state, local guidelines for confidentiality requirements</td>
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<td></td>
<td>• Memos</td>
<td>• Determine whether OMG is responsive to ID and Faculty concerns and whether those concerns being addressed by IDs and Faculty</td>
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<td></td>
<td>• Emails</td>
<td>• What issues are brought up as concerns across different communities (students, parents, Faculty, IDs, ITs, OMG, funders)?</td>
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<td></td>
<td>• Notes</td>
<td>• How are resources provided by OMG being used to assist in collaborative activities?</td>
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<td>• Collaboration Website</td>
<td>• These artifacts will be used to triangulate findings from interviews, focus groups and surveys.</td>
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<td>• Main Website</td>
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<td></td>
<td>• Inquiries from the public (from students, parents, etc.)</td>
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<tr>
<td>Observation</td>
<td>• Group Meetings (Writing group, ID meetings, etc.)</td>
<td>• Determine the degree to which statements about concerns and issues raised by participants are manifest in the meetings and interactions among groups and individuals at meetings</td>
<td>• UCEC staff travel to meetings</td>
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<td>(as opportunities for natural groups present themselves)</td>
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4. Course-Level Evaluation Plan

A comprehensive plan will take advantage of the evaluation opportunities available in the detailed course designs that are only now being completed by project faculty and reviewed and analyzed by the UCEC project team (see evaluation team in section 5). It is accordingly a key milestone for the evaluation and is anticipated to be completed in September 2011.

This version of the evaluation roadmap provides an overview of:

- the approach taken to assessing educational effectiveness overall;
- the approach taken to addressing key research questions set out in section 2; and
- how the evaluation proposes to assess the impacts that online courses have on key target groups (faculty, teaching assistants, instructional designers, and students).

Appendix A provides more detail on evaluation that is being conducted in 2011 to trial data collection and analysis.

4.1. Learning Objectives and Measurement

Consistent with outcome-referenced, conditions-based theories and models of instructional design (ID)—generally understood to be the most influential ID theories (Ragan, Smith, & Curda, 2008)—the work of the OIPP developers places considerable emphasis on the creation and integration of appropriate learning objectives into the online course design and matching appropriate learning technologies with those objectives. In order to accomplish this, OIPP will be drawing on the lessons learned in the landmark *How People Learn* (Bransford, Brown, & Cocking, 1999) and has formed a development team of instructional designers that will help participating faculty incorporate innovative technologies that match their visions for what and how students should learn.

This approach to course development rejects the use of technology for technology’s sake but instead seeks purpose-driven avenues to student learning (Dwyer, 1991; Mayer, 2009). For example, the development team may provide guidance and advice to course faculty about how to move a face-to-face activity (such as a demonstration of the “winner’s curse” in an economics course) into the online realm by incorporating learner/experience/activity/content-centered instructional approaches (which may use a series of simulations or games played with the computer or with other online participants to demonstrate the same principle in a very different way). It is important to keep in mind that quality learning will not result simply by adding a tool or technology to a course; rather, course design and implementation should be learner-centered, knowledge-centered, assessment-centered (especially formative), and community-centered (Bransford et al., 1999).²

² While outcome-referenced, conditions-based theories and models have often been framed in contrast to these learner/knowledge/assessment/community-centered instructional approaches, there is no inherent conflict between them. Some outcomes or conditions (including disciplinary context) may favor one type of learning approach over another. OIPP views such decisions as driven by the faculty member’s understanding of content and professional judgment rather than by a dogmatic stance around the “right” way to teach. This is consistent with the instructional design literature which suggests that actual implementation of these learning frameworks is most often eclectic and driven by educational and strategic decisions on a course-by-course basis (Smith & Ragan, 2005).
In order to measure the degree to which the objectives built through the faculty/instructional designer collaborations are achieved, we will adopt a goal performance–improvement perspective (Clark, & Nguyen, 2008) combined with a program theory approach to evaluation (Chen, 2005; Rogers, 2000), which advocates broadening the search for improvement beyond the standard measures of success (grades) towards other possible measures of success that may reflect mechanisms by which such outcomes are achieved, rather than solely whether the specific outcomes are met. In the context of higher education, this broader set of outcomes could include persistence in the class, increasing interest in the content area, increased engagement with the material, changes in course-taking patterns, and increases of academic self-efficacy, among others. Connections between the instructional methods and the outcomes will be made through logic models for each course. Measurement of these concepts of learning/change in both the cognitive and affective domains will be done using Astin’s (1993) framework (described below). This approach to setting outcomes, identifying possible causal mechanisms, and measuring improvement reflects a priority on an instructional and evaluation approach that incorporates both the cognitive and affective realms (problem solving, critical thinking, creative thinking, psychological engagement, affective engagement, etc.) and the process of learning rather than simply evaluating the acquisition of factual content (Chen, 2005; Rogers, 2000; Wiske, 1998).

In the following table we demonstrate how the Astin (1993) framework can be used to organize connections between various learning theories and the different tools that could be used to achieve multiple learning objectives. Table 2 reflects a 2x2 typology of learning objectives posited by Astin (1993) as important in higher education. The 2x2 factors are categorized as processes (affective and cognitive) to match with measurable individual outcomes (psychological and behavioral), resulting in 4 types of learning outcomes. The first column of the table represents examples of learning objectives; the second column lists suggested learning theories that could be used to affect those learning objectives; items in column three describe specific online learning tools that are consistent with the learning theories and could help students progress toward acquisition of these learning objectives. Astin’s model was adopted by Pascarella and Terenzini (2005) to serve as an organizing principle for the important learning relationships in higher education and has a great deal of currency in the higher education literature. Thus, it is a useful starting point for the proposed study to characterize the outcomes of interest to the OIPP.

As reflected in Table 2, the learning outcomes assessed in this study are multi-dimensional and cover traditional content mastery objectives (course grade, standardized tests, etc.), academic persistence (course completion), as well as less traditional measures such as critical thinking skills (complexity of wiki creation, content analysis of work product, and chat sessions, etc.), academic self-efficacy (survey), and academic engagement (survey, interactivity metrics such as counts of chat sessions initiated, form threads, messages consumed and produced, etc.). In addition, it is equally clear that the teaching methods of the online courses will not likely conform to a single learning theory. As discussed above, this is partially due to the fact that the project expects to support courses from a range of disciplines. This suggests that in some gateway courses such as the sciences, where the feedback and practice loop is imperative to developing a strong knowledge-base, the courses will leverage technology to provide robust opportunities for practice and feedback (e.g., Boshuizen, et

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3 It is important to note that the 2x2 structure posited by Astin could be conceived as suggesting that these factors are orthogonal to one another. We are not proceeding under this assumption. The Astin framework is being used as an organizational structure to emphasize the idea that online education may impact multiple areas, and unless all of these areas are identified and analyzed, important effects might be overlooked by an evaluation.
al., 2008; Vygotsky, 1978). In other cases, where analysis and synthesis is critical, we will look at ways for students to engage in content development, peer review, and written communication (e.g., Astin, 1993; Barrows & Tamblyn, 1980; Boshuizen, et al., 2008; Festinger, 1957).

All OIPP courses will be encouraged to develop both general and content-specific learning objectives and, with assistance from the evaluation team, a logic model for how each of the online components will lead to positive outcomes. This logic model will form the basis for the course-level evaluation and will allow the direct testing of the efficacy for particular types of instructional approaches by providing evidence substantiating particular mechanisms for achieving student outcomes. Instructional designers will facilitate the development of learning activities and modules that will specifically address these objectives and incorporate assessment techniques that take advantage of the learning environment. These could be used to provide information to instructors and students about how well the learning process is meeting desired outcomes. In addition to information used to monitor learning, assessment techniques facilitated by online technology will be used to augment more traditional forms of assessment used for grading (e.g., the project’s approach to identifying and measuring persistence and engagement outcomes of its students) (Allen & Seaman, 2009; Diaz, 2002). Active engagement will take place wherever possible through role-playing, case studies, engaged debate, and peer review as well as enhanced connections to the institution and peers through social networking tools. The theoretical and empirical basis for suggesting that these approaches may enhance persistence and engagement can be found in the research of Bandura (1977) and Tinto (1993). The project will also look to utilize common social networking techniques and tools in order to support approaches that extend beyond the individual classroom, enabling access to academic services such as advising, peer-tutoring, and ad-hoc study groups. Exploration will also be done in regards to connecting online students with their campus-based cohort and the community beyond the walls of the university through the open-content learners and service learning programs. Such an extensive development approach is contemplated to assure variation in the types of courses and approaches taken by faculty so that individual faculty can experiment and create the course that best matches the types of learning outcomes they wish to foster.
<table>
<thead>
<tr>
<th>Learning Constructs</th>
<th>Learning Theory/Empirical Relationships in Higher Education</th>
<th>Theory-Consistent Online Tools to Meet Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affective-Psychological Dimension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy Toward Subject Matter</td>
<td>Performance accomplishments, vicarious learning experiences, encouragement (Bandura, 1977)</td>
<td>Computer-based feedback based on low-stakes formative assessments; Virtual case studies; Participatory simulations</td>
</tr>
<tr>
<td><strong>Affective-Behavioral Dimension</strong></td>
<td>Blogs, chat, conferences, forums, online multi-media group projects</td>
<td></td>
</tr>
<tr>
<td>Academic Engagement &amp; Social Skills</td>
<td>Undergraduate socialization model (Weidman, 1989)</td>
<td>Blogs, chat, conferences, forums, online multi-media group projects</td>
</tr>
<tr>
<td>Academic Persistence</td>
<td>Performance accomplishments (Bandura, 1977); Student departure theory (Tinto, 1993)</td>
<td>Professional online projects, social network tools</td>
</tr>
<tr>
<td><strong>Cognitive-Psychological Dimension</strong></td>
<td>Incorporating previous lessons, background modules to improve prerequisite skills, real-time assessment of progress</td>
<td></td>
</tr>
<tr>
<td>Acquisition/Demonstration of Content Knowledge</td>
<td>Scaffolding towards acquisition of new knowledge (Vygotsky, 1978); Cognitive structural theory (Piaget, 1964)</td>
<td>Wiki creation, virtual office hours, computer-mediated instruction and homework, e-portfolios, social networking, discussions, controversial simulations</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>Faculty-student orientation, studying, homework, interdisciplinary classes, (Astin, 1993); Diverse peer interaction for cognitive dissonance (Festinger, 1957)</td>
<td>Wiki creation, virtual office hours, computer-mediated instruction and homework, e-portfolios, social networking, discussions, controversial simulations</td>
</tr>
<tr>
<td>Attitudes and Beliefs</td>
<td>Peers, faculty, time studying, college-activity, activity outside of school, majors (Astin, 1993); Experiential learning theory (Kolb, 1984)</td>
<td>Blogs, chat, conferences, forums, public surveys</td>
</tr>
<tr>
<td><strong>Cognitive-Behavioral Dimension</strong></td>
<td>Blogs, chat, conferences, forums, virtual office hours, computer-mediated writing, wikis, online projects</td>
<td></td>
</tr>
<tr>
<td>Citizenship</td>
<td>Peers, essay exams, faculty, participation in civic debate (Astin, 1993)</td>
<td>Blogs, chat, conferences, forums, virtual office hours, computer-mediated writing, wikis, online projects</td>
</tr>
<tr>
<td>Career Development</td>
<td>Academic involvement (Astin, 1993); Problem-based learning (Barrows &amp; Tamblyn, 1980)</td>
<td>Blogs, chat, conferences, forums, virtual office hours, computer-mediated writing, wikis, portfolios</td>
</tr>
</tbody>
</table>
Founded in basic assumptions about how individuals can best learn, the learning environment and
the associated assessment system developed will emphasize frequent assessment of student learning
as a means to provide feedback concerning the levels of learning achieved and the time taken to
reach those levels. Since information will also be available about the initial preparedness and
background of the participating students through university information systems and pre-instruction
surveys, this analysis can be extended to identify how well individuals with varying backgrounds are
progressing through a course. The instructor will have available information that can guide
moderated discussion activities or suggest additional efforts to clarify difficult content areas. This
information can also provide feedback for future course updating and redesign.

The National Education Technology Plan 2010 from the Department of Education has recently
advocated incorporating technologies that are in frequent use in various professional disciplines as
part of a learning environment and making use of frequent assessment to evaluate strengths and
weaknesses in the learning process. The learning methodologies and assessments that will be
fundamental in the online pilot course development will provide this type of approach and
information gathering, enabling a research approach to drive further development and updating of
online methodologies while also giving students experience with modes of access to information
they will encounter in the real world.

4.2. Full Course Evaluation Plan and Research

Given the large number of courses under development in OIPP, there are multiple opportunities for
researching critical questions about the interaction between online learning environments, students,
and faculty. Which questions will be addressed with data derived from which courses is yet to be
determined. At a general level, this study will be broken down into three distinct areas, each with
distinct approaches to its respective research questions, and each with important functions and
outcomes that take advantage of the project’s scope. This research agenda is very ambitious and is
intended to be so. It represents the scope of the ambition of the OIPP, but may be modified and
prioritized through consultation with stakeholders and the availability of funding sources.

Characterization of Courses

In what ways will faculty use the capabilities of online courses to enhance the learning experiences and academic
outcomes of students, and how do these approaches affect the nature of learning interactions (student-content, student-
student, faculty-content, student-faculty, etc.) as well as learning outcomes?

This first research question takes advantage of the fact that the OIPP (through the course proposal
process and professional development component) has chosen to support the development of
courses and pedagogical approaches that represent a significant portion of the methods currently
used in the online universe and potentially develop several that are completely novel. This potential
stems from two factors—a flexible, customizable online platform and the ideas generated by UC
faculty working in conjunction with technology experts on the campuses to develop and construct
their courses. With this approach there is the potential to create a set of courses that are not simply
driven and constrained by the capabilities of the online platform. Instead, courses could be shaped
by learning outcomes determined by faculty and represent a truer reflection of the potential uses of
online technologies within the context of a large, research-driven institution of higher education.
Given this rich set of courses, there will be extensive data to be mined with respect to the key student and faculty outcomes and processes discussed above. Using the interview and observation protocols designed in Component 1 of the evaluation, in conjunction with the data collection and capture capabilities of the online platform itself, we will create logic models for the functioning of each of the courses with respect to the intended content, pedagogical, and affective outcomes of the course so that we can assess the strength of the match between use of the online tools and the specific learning outcomes those tools were designed to meet. This process is critical to untangling the media/method confound described by Smith and Dillon (1999) which suggests that many “no significant difference” findings in comparative research studies result not from the online tool itself, but from the content pushed through that tool. This confound between the particular tool and the use of that tool makes comparative studies very difficult. While the work of Smith and Dillon focused on distance education, the same confounds exist when examining comparisons in online learning. Smith and Dillon suggest that only by clearly characterizing the intent and use of the tools can such comparisons be made appropriately and apples can be compared to apples. Thus, understanding the functioning of each of the courses in and of themselves must be a key first step in moving forward with any comparative analysis.

All these data will be analyzed for this purpose with the intent of determining the most effective strategies within a given context. These findings will form the basis of a formative/process evaluation to shape both the professional support provided to course developers and the pedagogical choices made by faculty members in the subsequent iterations of the program.

In addition to the knowledge gained by the course characterization process, the integration of data collection on our outcome metrics into this formative/process evaluation will create an extremely valuable trove of data. We intend these data to be made available for research purposes. Given the mass of data we expect to gather, the information amassed could be examined for years to come at the micro-level (archived interactions between students and faculty, uploaded work products, or time-on-task) and macro-level (overall usage of the system, systemic interactions among students and TAs, the creation of internal/external classroom networks), generating important findings well beyond the life of this project, and creating the basis for subsequent comparative studies across courses for this and future research.

**Establish Causality and Impact-Within Course Analysis**

*How do online approaches to education perform relative to more traditional approaches with the same function across multiple educational outcomes (i.e., content, problem solving) and domains (i.e., cognitive and affective)?*

Building on the broad descriptive approach taken in the first question, we will frame a much more focused design for our second research area. We seek to estimate the causal impact of specific online approaches across multiple outcomes and learning domains using both experimental (random assignment) and quasi-experimental designs (interrupted time series, regression-discontinuity, or propensity score matching), carefully choosing the instructional approaches to be examined to avoid the media/method confound described above. Again, since the university is supporting the OIPP, selecting the courses, and providing the platform and technical assistance, researchers have the unique opportunity to shape the courses while obtaining the agreement of faculty and campuses as they move through the design process in order to facilitate the selection of courses for these comparison studies.
Given this early stage in course development, determining the exact courses to be used for these analyses is nearly impossible. In order to avoid the media/content confound, and to suggest an assignment process that will allow for any type of causal inference, very clear detailed information must be available. This information will be available once the logic models for each course are created.

An example of the type of question we would like to address is whether using formative student assessments and engagement data in real-time to identify and assist students who are at risk of poor performance will prove to be a pathway leading to better outcomes when compared with results from traditional classrooms where such instant analysis is not possible. Ideally, we will assign students randomly to the online component which will expose them to this real-time monitoring/remediation system. Assuming the validity of the randomization, if students who participate in the online system perform better and exhibit more positive outcomes according to our set of metrics, we could be confident in attributing the differential impacts to the treatment. In this case the media/method confound is not an issue since neither the media, nor the method, would have been available without the online resource. However, since key sub-populations (those who were less prepared, or had specific learning difficulties in this area) would be differentially affected by the opportunity for additional assistance, the research design will specifically check for differences between these key groups.

Alternatively, where face-to-face courses exist with identical instructors, we could stack student assignment by assigning students who enroll first to the face-to-face course until it was full, then enroll the balance in the online course. This method of assignment procedure could act as a discontinuity for a regression discontinuity analysis—an analytical technique that should provide unbiased estimates of programmatic impact as long as particular conditions are met (particularly that the assignment mechanism be very clearly enforced).

In addition, we could use previous cohorts of students who took the identical face-to-face course (without the online features) as a comparison group—particularly if the comparison courses were offered at the same time of year, and no other courses but the online version of the course could be taken in the next year.

Each of these designs present advantages and disadvantages, with the most powerful (and most difficult to implement) being random assignment and the least powerful (but easiest to implement) the cohort comparison.

Ideally, we will choose a high enrollment, required, hybrid (combined face-to-face and online design), lower-division course for our study. Each of these characteristics will help to strengthen the causal estimates by systematically mitigating threats to validity. High enrollments will increase the statistical power of our designs so that we may be able to see evidence of small to moderately sized effects (Shadish, Cook, & Campbell, 2002). A power analysis of a 300-student course and modest assumptions about the strength of covariates suggest a minimum detectable effect size of approximately 0.2, a moderate number in line with many published effects of online instruction (Means, Toyama, Murphy, Bakia, & Jones, 2010). The required nature of the course is likely to discourage attrition which could pose a severe threat to internal validity (Angrist, Imbens, & Rubin, 1996). In addition, the hybrid nature of the course will allow for a single professor to deliver/oversee content which will reduce variation due to instructor characteristics, but would limit generalizability (Shadish, Cook, & Campbell, 2002)—a tradeoff that would have to be considered.
and possibly mitigated if more faculty could be persuaded to participate. Finally, lower-division courses are those most likely to be taken more broadly by populations that are most similar to those intending to transfer or ultimately attend UC. Thus, these findings could have the broadest applicability and impact. In addition, we will seek to use additional design features (such as attrition surveys and interviews) to mitigate and identify additional potential threats such as cross-contamination between groups (Rossi, Lipsey, & Freeman, 2004). Finally, we can track those students who moved onto the upper-division courses and test whether there are differences in achievement between those students who experienced the online courses and expand the comparison group to include the students who only experienced other courses that are traditional face-to-face. This could get at the question of sustainability, and increase the generalizability of the findings since the project could incorporate more faculty who taught the traditional courses in the same and previous years. While there might be some selection bias due to choices students might make to take the prerequisite course to avoid or seek out the online options, the tradeoff for more information about sustainability and generalizability is compelling. In addition, there are post-hoc techniques such as propensity score analysis to reduce selection bias by increasing matches on observables (Guo & Fraser, 2009; Rubin, 2006).

Finally, just as important as the assignment and sustainability assessment to this research is the commitment to determine not only whether the outcomes measured between groups differ, but the reasons for those differences. To accomplish this, we will be using a program-theory based approach for this analysis which places a premium on not only understanding whether a program is effective in changing outcomes, but how outcomes are changed by the program (Chatterji, 2008; Chen, 2005; Rogers, 2000). This requires a strong understanding of the ways in which the program components interact with the students to increase the cognitive (grades, post-test) and affective (engagement, satisfaction) outcomes of the program. Thus, once the courses are selected and designed, a comprehensive logic model and set of intermediate outcomes must be identified and plans for their assessment must be created.

This approach to these casual estimate research designs has a great deal of potential for answering fundamental questions about teaching and learning in a relatively delineated context that could have important implications for future faculty choices on the myriad approaches available to them.

**Universal Design for Learning**

*Do the principles for universal design for learning increase outcomes for all students and/or decrease the variation in student outcomes, by allowing for multiple modes to deliver, acquire, and demonstrate content and learning?*

While the first two research questions focus on issues that are relatively well established but unsettled in the larger community researching online education, Research Question 3 focuses on a relatively new area: universal design for learning (UDL). This area has not yet been as well researched, carefully conceptualized, or rigorously pursued, so it is a strong candidate for use as a design principle for this study. In the most stripped-down sense, UDL can be seen as an outgrowth from the universal design movement in architecture:

UDL provides a blueprint for creating flexible goals, methods, materials, and assessments that meet the needs of diverse learners. It draws on the principles of the universal design movement in architecture and product development, which calls for design that from the outset accommodate the greatest variety of
individuals, making the need for costly and unattractive after-the-fact retrofitting unnecessary. (Rose, Meyer, & Hitchcock, 2005, p. 3)

The core shared across these disparate domains is the idea that accessibility for all people should be the gold standard in all spaces both physical and intellectual, particularly for those who have been systematically excluded in the past. This stance has found a great deal of resonance in the education world (National Commission on Excellence in Education, 1983).

In terms of learning, this approach can manifest itself in many ways. First, it can simply appear as increased physical accessibility for those who may have challenges related to location, family situation, or physical or mental conditions that may not allow them to engage fully with a traditional face-to-face classroom environment through large print e-books or fully online, self-paced courses. However, UDL may be conceived even more broadly to encompass learning modalities, multiple intelligences, interests, or variation in background preparation. By designing both curriculum and pedagogy to have multiple entry points, a student without a strong content or methodological background in a particular course could still be successful by moving more deliberately through a myriad of scaffolding activities to provide the groundwork necessary for understanding the more complex materials. Meanwhile, someone with a stronger background could move directly onwards. Conversely, students who are extremely well prepared could have enhancements available to them so that they could pursue more complex interests and thus keep themselves more engaged in the coursework. Thus, UDL has the potential to enhance the educational experiences of all students but is likely to have greater effect on students who have been historically more marginally successful and to have a greater benefit for those who lose engagement if the materials do not challenge them sufficiently. Ultimately, in the long run UDL has the potential to change course-taking patterns by encouraging students with interests but weaker backgrounds to take courses that they might otherwise have avoided because of the lack of appropriate entry points. UDL might also encourage students to remain engaged in introductory courses and benefit their peers who may feel more challenged by the content. All of these potential impacts may have implications for diversifying fields and areas that historically have been less accessible to a large number of students.

In order to address these key issues surrounding UDL, it is necessary to construct an operational framework entailing the UDL approach and ensure that the courses that are selected for the pilot employ a range of UDL components such that sufficient variation exists across courses. Given sufficient variation, if the underlying theory supporting the claims of benefits to UDL is true, we would expect to find that marginalized groups (those who have special needs, distance challenges, or poor preparation) or students with excellent preparation would perform better in courses with higher levels of UDL incorporated into them. That is to say, within-course variation on key outcomes (both cognitive and affective) should be lower in courses that incorporate more UDL components when compared to more traditionally structured environments. These differences could be benchmarked using the variation in grades and standardized satisfaction scores against previous iterations of the course provided without the online UDL components. Alternatively, if UDL components were built into courses that were intended to affect different identifiable sub-populations, then in the event we found that each of these components had their intended affects in the particular sub-populations that were targeted, a compelling argument could be made that UDL is an effective strategy for addressing the needs of diverse learners. These findings could be identified through in-depth interviews with students taking courses both up and down the UDL scale and matching particular UDL components with specific actions, experiences, or hypothesized behaviors that could be used to explain differential outcomes. For example, if students who had weaker
backgrounds (as measured by student scores on placement examinations or pre-requisites) spent more time in the modules designed to scaffold students towards the more complex content than students with stronger backgrounds, we can reasonably attribute lower variation among students with differential background strengths to the increased work put into the course. In addition, if we find that similarly weak students who did not use the models do worse than their harder-working counterparts, this could be seen as evidence consistent with the theory of UDL.

This design is by no means decisive since there is likely to be considerable selection bias in those students who choose to engage in the class for longer periods of time. However, the fact that these students have the option to engage in helpful activities while taking the online course and that their actions are associated with more positive outcomes is a compelling case for UDL.

**Data Collection**

Collectively, these three research questions and their associated designs frame the development of a very important and potentially highly influential body of work. Through characterizing a broad array of assessment, pedagogical, and curricular approaches, Research Question 1 could provide important examples and possibly new ways to configure online learning in the higher education context. Research Question 2 has the potential to strengthen the evidence base surrounding the impacts of an established approach to online education. In addition, the results may also inform the broader question of how the approach influenced the outcomes observed in the study. Finally, Research Question 3 has the potential to advance the research in the field by contributing new tools and empirically based evidence that universal design for learning has the potential to reduce variation in outcomes and potentially improve them for all students. This potential may only be realized with strong data collection protocols and categories guided by these research questions.

Data collection for this project outlined in Table 3 (see Appendix B for a more detailed data collection framework) is a very large and complex endeavor, and requires clear coordination between the evaluation group, the technical group, and faculty to ensure that confidentiality is protected and that courses are not disrupted, while also allowing for enough accessibility for the research to proceed relatively unimpeded. This balance can be struck by careful planning of data collection, in coordination with faculty, and a clear understanding of how the data are collected and stored by the learning platform. Thus, the function of the management group to support this work will be at a premium.

There are additional challenges to the data collection process since nearly 40 courses will be developed and launched on a rolling schedule beginning as early as Winter 2012. This tight schedule requires all data collection tools to be created and ready for roll-out by Fall 2011. The types of data to be collected and their use can be reviewed in Table 3, which delineates the population and data collection type, the content elements, as well as the use of that data in the larger data analysis project. Note that all three of the research questions will be addressed through use of these data sources. The key distinctions among the three research questions are related to issues of sampling, assignment, and analytic framework, all of which are independent of the data collection.

Critical resources that will help meet this ambitious timeline are research team members (Dr. John Yun, Dr. Patricia Marin, Dr. Richard Mayer, and Dr. William Shadish) who have deep expertise in the design and implementation of both qualitative and quantitative research designs as well as strong backgrounds in the content area (particularly Dr. Mayer) and student target population (particularly
Dr. Marin). In addition, the UCEC evaluation team has access to the UCSB Social Science Survey Center (SSSC) which will assist with this research project. Under the leadership of Dr. John Mohr, director, and Dr. Paolo Gardinali, associate director, the SSSC has the capacity to create and implement survey designs critical to a wide range of research efforts. Its resources include state of the art data collection software, its own secure server for internet surveys, online survey technologies, as well as both automated and manual phone banks for follow-up inquiries. As the only survey center in the UC System, it possesses a wealth of experience dealing with organization issues within the UC which will be invaluable for a project of this scope. Finally, both Drs. Mohr and Gardinali have an intense interest and expertise in novel modes of data acquisition and data mining. The involvement of the SSSC adds to the strong infrastructure in place for rigorous data collection.
Table 3. Overview of Data Collection and Use

<table>
<thead>
<tr>
<th>Data Collection</th>
<th>Content Elements</th>
<th>Data Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey Data</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Faculty</strong></td>
<td>• Time allocation log</td>
<td>• Cost effectiveness study of how time is allocated/reallocated in online courses</td>
</tr>
<tr>
<td></td>
<td>• Satisfaction with specific course dependent elements (learning platform, functionality)</td>
<td>• Formative assessment of course implementation and platform support</td>
</tr>
<tr>
<td><strong>Students</strong></td>
<td>• Overall engagement survey (pre/post)</td>
<td>• Measurement of changes in affective and engagement outcomes as evidence to support link of learning tool</td>
</tr>
<tr>
<td></td>
<td>• Efficacy survey (pre/post)</td>
<td>• Measurement of student satisfaction</td>
</tr>
<tr>
<td></td>
<td>• Perception/Satisfaction with online course elements relative to traditional courses (pre/post)</td>
<td>• How students allocated time within course and between courses</td>
</tr>
<tr>
<td></td>
<td>• Perceived time allocation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Quality of engagement with tools</td>
<td></td>
</tr>
<tr>
<td><strong>Interview Data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td>• Effectiveness of time allocation</td>
<td>• Cost effectiveness study of how time is allocated/reallocated in online courses</td>
</tr>
<tr>
<td></td>
<td>• Course management challenges</td>
<td>• Formative assessment of course implementation and platform support</td>
</tr>
<tr>
<td></td>
<td>• Perceived links between outcomes and online tools</td>
<td>• Summative assessment of course creation process</td>
</tr>
<tr>
<td></td>
<td>• Satisfaction with process of course creation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Desire to repeat process</td>
<td></td>
</tr>
<tr>
<td><strong>Students</strong></td>
<td>• Description of experiences with online tools</td>
<td>• Formative assessment of course implementation and platform support</td>
</tr>
<tr>
<td></td>
<td>• Specific examples of good and bad experiences</td>
<td>• Evidence to support link of learning tool</td>
</tr>
<tr>
<td></td>
<td>• Follow-up on survey results</td>
<td>• Identification of contexts in which tool was effective</td>
</tr>
<tr>
<td></td>
<td>• Quality of engagement with tool</td>
<td></td>
</tr>
<tr>
<td><strong>OIPP Staff</strong></td>
<td>• Perception of professional development sessions</td>
<td>• Formative assessment of course development processes</td>
</tr>
<tr>
<td>(OMG, IDs, and ITs)</td>
<td>• Assessment of consultation and learning outcome identification and matching</td>
<td></td>
</tr>
<tr>
<td><strong>Platform</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Faculty Usage</strong></td>
<td>• Time spent online on course activities</td>
<td>• Cost effectiveness study of how time is allocated/reallocated in online courses</td>
</tr>
<tr>
<td><strong>Student Usage</strong></td>
<td>• Time spent online on course activities</td>
<td>• Measurement of time on task and student engagement/dosage</td>
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<tr>
<td></td>
<td>• Quality of engagement (analysis of engagement with tool)</td>
<td>• Link participation with quality of work product</td>
</tr>
<tr>
<td></td>
<td>• Student work products</td>
<td></td>
</tr>
<tr>
<td><strong>Secondary Data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Student</strong></td>
<td>• Background characteristics</td>
<td>• Randomization test/covariates for analysis</td>
</tr>
<tr>
<td></td>
<td>• Course taking</td>
<td>• Subsequent performance</td>
</tr>
<tr>
<td></td>
<td>• Future performance</td>
<td>• Changing course taking patterns based on observables given online option</td>
</tr>
</tbody>
</table>
Two levels of important research are expected from this project. The primary innovations (from which all the rest are expected to derive) are (1) the matching or creation of online tools to instructor-designed learning outcomes through professional interaction between course instructors and instructional technology specialists at the UC, and (2) the use of universal learning design principles as an organizing framework for assessing the use of the online tools.

Based on the outcome framework outlined in Table 2, the environmental and human factors important to learner success are already built into the project’s conception of tool use. Thus, the evaluation and assessment tools will reflect the multiple outcomes that can be derived from each application. In addition, the expectation is that the courses, in general, will also internalize these connections and, by default, follow recommendations and connections made by learning theory and empirical research on best practices. Finally, the fact that the evaluation of each of the courses will include a detailed logic model describing the specific ways that the online tools will achieve the particular outcomes targeted provides additional assurance that the innovations adopted are appropriate for their specified purpose. This integration of function and outcome is often lacking from online innovations such as these. Therefore, this provides a unique research opportunity to examine them at this scale.

For example, if a specific goal of the instructor was to reduce the number of students who performed poorly or dropped an introductory physics course, the design team would discuss the ways in which this outcome could be addressed. Learning theory would suggest that scaffolding may assist poorly prepared students become successful (Seel, 2008; Vygotsky, 1978), and that some students who had the skills may need performance success to increase their academic self-efficacy in the subject matter (Bandura, 1977; Clark, & Nguyen, 2008). In this case, both groups could benefit from an adaptive homework system that provided guidance for those who answered questions incorrectly, thus providing scaffolding experiences for students with weak academic backgrounds, and performance success for students with poor self-efficacy. In each case, these hypotheses would have been derived from faculty goals and could be substantiated via the data collected in response to the logic model created at the design stage of the course which delineated the goals of this innovation.

Finally, the choice of UDL as an organizing principle for the innovations is directly in line with the long-term goals of the broader Online Instruction Pilot Project and places the specific needs of all learners within the core of the design approach to each of the learning tools. Thus, appropriateness is an integrated component of tool design, not simply an external consideration competing with myriad others for the attention of course designers.

4.3. Estimating Impact on Target Populations

This evaluation study will address the impact of the online courses on several key groups. In Phase 1 of the study the key targets are the UC faculty, instructional designers, and OIPP staff who will be designing and supporting the design of the online courses. This formative/process evaluation will focus on implementation and provide information to project staff to improve implementation supports. In Phase 2 the targets are the students who are taking the online courses, as well as the faculty and teaching assistants who deliver instruction. By examining both how online course structures impact both the delivery and participation in courses, the evaluation will provide good information about the ways in which online education can be shaped for maximum positive impacts
on workload, student participation, learning outcomes, and access. In addition, such an evaluation will highlight the critical role played by the system in supporting online development and the degree to which this approach reaches its objectives of expanding access in a cost-effective way, while developing the capacity of its faculty to use the existing technology in effective ways.

**Faculty:** Many of the faculty engaged in the OIPP do not have a strong understanding of the approaches and capabilities of the technologies that exist, nor how the utilization of these technologies might directly impact the learning outcomes identified in their curriculum or how they can enable assessment. Instructional design staff will use faculty ideas as a basis for making clearly defined matches between learning objectives and technology. Staff will also create or adapt the existing technology to meet faculty needs. These activities will be intense and often require one-on-one work with faculty teams to ensure that the best matches between learning objectives and online tools and assessment mechanisms are made. Understanding how these interactions are received, and the ways in which such support could be delivered more effectively and efficiently (both from the perspective of the faculty and the IDs) is critical as the OIPP moves towards a broader set of online courses and a wider-range of faculty participate in the work.

**Teaching Assistants:** TAs must often modify how they allocate their time in online courses. The increasing or changing requirements must be factored into any decision about expansion or modification of the online course creation process.

**Students:** UC’s enrolled undergraduate student population is generally well prepared (incoming freshman are admitted from the top 12.5% of California’s high school graduates, while transfers arrive from community colleges and other settings where students have successfully completed well-defined curricular paths). It is also very diverse. Historically, the University of California has gained a national reputation for enrolling a very high proportion of low-income students. In 2008-09, 31% of undergraduates received Pell Grants. In comparison, only 13% of undergraduates at Harvard, Stanford, and Michigan are Pell recipients; at Yale and Virginia the numbers are even lower, 10 and 8%, respectively. In 2010, the percentage of Pell Grant recipients rose to 39% of all UC undergraduates—the largest percentage in the university’s history. Four UC campuses—Berkeley, Davis, Los Angeles and San Diego—each individually enroll a greater number of Pell Grant recipients than the entire Ivy League (Undergraduate Access and Excellence at UC, 2010). Understanding how UC students interact with online courses, the degree to which online courses present opportunities for greater participation for students with different levels of preparation, and how online courses may leverage resources that may exist on one campus to share with all the others is critical for the UC to chart their entry into online tools for education.

A key component of the research project will be to explore how student engagement in the learning process could be enhanced by fostering new kinds of student–student, student–faculty, and student–content interactions permitted by the social networking technologies. Developers will also seek ways of designing a system that works to improve the success of students, including those qualified, high-potential pupils typically under-served by educational institutions. One of the avenues of this approach would be a system that includes tutoring modules and enhancements allowing students to engage in self-directed learning consistent with their individual learning trajectories.
5. Evaluation Team and Communication Plan

Effective collaboration is essential for any project that involves as many participants, entities, and stakeholders as this endeavor does. This “Communication Plan” describes how the OIPP and evaluation teams will work together to support the proposed research project.

The OIPP is managed by an advisory group appointed by the provost of the University of California. The group is chaired by Gene Lucas, Executive Vice Chancellor and Provost, UC Santa Barbara. Daniel Greenstein, UC vice provost for academic planning, programs, and coordination is project director and serves ex officio on the group. He combines an academic faculty background with a professional one in information services, digital libraries, and scholarly communication. The advisory group acts as the coordination point for OIPP's several key stakeholder groups including the UC Academic Senate, undergraduate deans, chief information officers, extension (continuing education) deans, and UC students. It meets at least four times a year to review the OIPP's progress and consult on the evaluation and to advise the provost accordingly.

The research/evaluation team will be led on a day-to-day basis by Dr. John T. Yun, an associate professor of education in the Gevirtz Graduate School of Education at UC Santa Barbara and director of the UC Educational Evaluation Center (UCEC), who brings expertise in quantitative methodologies and educational evaluation, content knowledge on academic access, and experience leading multi-disciplinary teams. A team of researchers, in conjunction with the UCSB Social Science Survey Center, has been assembled based on their nationally recognized expertise across topic areas essential for the successful implementation of this study (these are highlighted in detail below). This team will shape the project’s assessment framework, implement the study, and evaluate the data it produces. The participation of graduate student researchers will offer opportunities to train future scholars in these topic areas.

Dr. Yun and Vice Provost Greenstein will be assisted in this collaboration by five key Senior Personnel: Dr. Keith Williams, Dr. Richard Mayer, Dr. William Shadish, and Dr. Patricia Marin.

Dr. Williams is a UC Davis senior lecturer in the Department of Neurobiology, Physiology, and Behavior who in recent years has played a central role in faculty-led initiatives on curricular quality. He will act as a key contact point between OIPP and the UC faculty and in that capacity will collaborate with Dr. Yun on the project’s evaluation structure.

Dr. Mayer is a Professor in the Psychology Department at UC Santa Barbara. His current research involves the intersection of cognition, instruction, and technology with a special focus on multimedia learning and computer-supported learning. He is the author of numerous articles and books on the use of multiple media to facilitate learning, and will serve as a content and methodological expert in the design and implementation of the evaluation plan.

Dr. Shadish is a Founding Professor at UC Merced in the Psychology department and an expert in experimental and quasi-experimental causal analysis. Dr. Shadish will be supporting the evaluation team in the design and implementation of the project.

Dr. Marin is an Associate Researcher in the Gevirtz Graduate School of Education at UC Santa Barbara and the Associate Director of the UCEC. Her research focuses on underrepresented
students and issues of access in higher education. Her primary methodological responsibility will be in designing and overseeing the qualitative aspects of the research study.

The UCEC–OIPP collaboration will operate under the guidance of a management group which meets bi-weekly. It is convened by Vice Provost Greenstein and includes individuals taking a leadership role for the project in key areas.

- Project execution and management (Daniel Greenstein)
- Technology leadership (Mara Hancock, Kirk Alexander)
- Faculty relations (Keith Williams)
- Evaluation and assessment (Keith Williams)
- Legal counsel (Tina Combs)

All communication about the evaluation will be handled through this management group, which through its connections to the advisory group and the broader UC organizational structure will provide input and suggestions about the evaluation design.
Appendix A. Piloting Course-level Data Collection

Several courses accepted into the OIPP have been approved to begin in the summer (prior to their official participation in OIPP). This provides the evaluation team the opportunity to pilot and validate survey items, interview protocols, as well as potential analysis tools for the online interactions among students, between students-TAs, and between students-faculty. Baseline data collection began this summer on one of those courses. In addition, this opportunity will provide the evaluation team with a way to test data collection procedures to develop optimal approaches for contacting faculty, TAs, and students, and gathering appropriate administrative data where necessary and appropriate. By way of unpacking the broad research question of how online teaching techniques affect the learning interactions for both students and instructors, the research team will be piloting questions along these specific themes:

- What are the characteristics of students who select online courses?
  - How are they different from those who select face-to-face courses?
- What expectations do students who enroll in online courses have about those courses?
  - How do these expectations change after the course?
  - What do students who enroll in online courses identify as positive aspects of their courses?
  - What do students who enroll in online courses identify as negative aspects of their courses?
- To what extent are students who take online courses satisfied with their experiences?
- How do students who enroll in online courses perform on assignments and overall?
- How do students who enroll in online courses describe their level of engagement with the material, peers, and instructors?
- To what extent are students using the resources available to them in their online courses (TAs, online resources, peer engagement, etc.)?
- To what degree do the online courses use technologies and pedagogies that are considered “best practices”?
- To what degree do TAs feel supported in their work with the students?
- How do instructors and TA allocate their time? Does this differ between online and face-to-face courses?

In order to answer these questions, we are collecting the data elements in Table A1. These elements are analogous to the elements collected for the organizational evaluation, but focus on students and instructors, as well as the collection of administrative data from the campuses.
Table A1. Data Collection For Pre-OIPP Versions of Accepted Courses

<table>
<thead>
<tr>
<th>Data Collection Methods</th>
<th>Types</th>
<th>Purpose</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviews</td>
<td>• Student Volunteers</td>
<td>• To gather baseline information about student’s pre/post experiences in the course, particularly with the more innovative aspects of the course design</td>
<td>• UCEC staff travel to campuses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Recording devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Transcription services</td>
</tr>
<tr>
<td>Focus groups</td>
<td>• Teaching Assistants</td>
<td>• Gather experiential data about TAs have worked with students, and their opinions about how the class has gone, and how to improve it</td>
<td>• UCEC staff travel to campuses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Recording devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Transcription services</td>
</tr>
<tr>
<td>Surveys</td>
<td>• Students, TAs</td>
<td>• Design of future surveys (student attrition survey, student engagement survey, student interest, etc.)</td>
<td>• Social Science Survey Center/Direct Survey Collection through Local LMS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Data collection for demographic information, pre/post engagement, interest, and satisfaction</td>
<td></td>
</tr>
<tr>
<td>Student Data from Campuses</td>
<td>• Course-taking patterns, admission data, etc.</td>
<td>• To track student success in successive courses</td>
<td>• Implement a process for the collection and storage of archival data in accordance with IRB and Federal, state, local guidelines for confidentiality</td>
</tr>
<tr>
<td>Student Data from LMS</td>
<td>• Chat Rooms, Discussion Boards, Quizzes, Examinations, etc.</td>
<td>• To track the types of interactions and products created by students</td>
<td>• Access to local LMS</td>
</tr>
<tr>
<td>Faculty Time Allocation</td>
<td>• Personal Log</td>
<td>• To understand the ways in which faculty use their time in online courses</td>
<td>• Faculty time logs created by evaluation team</td>
</tr>
</tbody>
</table>
The collection of the administrative data from campuses will be greatly facilitated by a UCOP project to collect student-level data from all campuses into a centrally administered dataset at UCOP. By merging the survey data with course taking patterns, entry characteristics, and subsequent course grades from a centrally administered dataset, analysis of student outcomes and characteristics will be greatly enhanced and simplified. For example, many skeptics of the efficacy of online courses may criticize course grades as an indicator of high student achievement since the online course may simply be “easier” than the analogous face-to-face course. However, this ability to link with administrative data will allow the evaluation team to use performance in subsequent related courses as a key outcome measure, and compare those outcomes between different course types. This is a far more compelling metric because the subsequent courses were all taken under similar conditions, and (presumably) rely on content and skills developed in the previous courses. If there is no difference in performance (given appropriate assignment conditions described below), it may be reasonable to suggest that the online courses are preparing students no worse for subsequent courses than the face-to-face.

The data collection pilot described above will provide the evaluation team with an excellent chance to create, test, and validate process, procedures and constructs for the first official course roll-outs anticipated in Winter 2012.
Appendix B. Detailed Proposed Data Collection Plan

Tables B1-B3 describe proposed survey, interview, and document data elements for collection. In addition, these tables also include descriptions of the data elements, data sources, and the method and timeline for data collection.
### Table B1. Survey Data Collection Plan for Faculty and Students

<table>
<thead>
<tr>
<th>Data</th>
<th>Content Elements</th>
<th>Purpose of Collection</th>
<th>Sample</th>
<th>Method For Collection and Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>OIPP Faculty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Faculty Post-Workshops** | • The extent to which elements of the workshop were important.  
• The extent to which elements of the workshop were useful.  
• Open-ended responses to what might be helpful in the future. | • To determine which elements of the faculty workshops were important to the faculty, which elements the faculty thought were done well, and what support is still needed. | • All faculty who attend OIPP workshops. | • Paper and Pencil  
• Surveys are to be handed out to the faculty by evaluators an hour before the end of the last day of the workshop. |
| **Faculty Pre-Instruction** | Expectations of:  
• The Course (Generally)  
• Technology  
• Students in the Course  
• Workload  
Perceptions of Online Learning | • To determine faculty perceptions ahead of their experiences in the courses. This could be compared to the post-instruction survey to determine the level of differences between the expectations and actual experiences of the faculty. | • All faculty who instruct a course | • Online survey.  
• Run on the LMS  
• The survey link will be sent to faculty two weeks before their first class begins and they will be given until the first day of class to complete the survey. |
| **Faculty Post-Instruction** | Descriptions of experiences with:  
• The Course (Generally)  
• Technology  
• Student Interactions  
• Student Performance  
• Workload Level  
Overall Experience  
Suggestions for Improvement | • To determine the types of experiences that different faculty had with their courses. This survey can be compared to the pre-instruction survey to determine the level of differences between expectations and actual experiences. | • All faculty who instruct a course | • Online survey.  
• Run on the LMS. Will need an automatic prompt.  
• The survey link will be sent to the faculty immediately following the end of the course. They will have two weeks to complete. |
| **Faculty Senate** | **Faculty Senate Survey** | • Expectations for UC Online  
• Perceptions of online learning  
• Open-Ended thoughts on project | • To determine what the faculty senate think about the project and determine if there are aspects of the project that could have more focus. | • Online survey.  
• Run through the Social Science Survey Center. |

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Table B1. (Continued)

<table>
<thead>
<tr>
<th>Data</th>
<th>Content Elements</th>
<th>Purpose of Collection</th>
<th>Sample</th>
<th>Method For Collection and Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>Expectations of:</td>
<td>• To determine student perceptions ahead of their experiences in the courses. This could be compared to the post-instruction survey to determine the level of differences between the expectations and actual experiences of the students.</td>
<td>All students in all OIPP courses</td>
<td>• Online survey.</td>
</tr>
<tr>
<td></td>
<td>• The Course Structure</td>
<td></td>
<td></td>
<td>• Run on the LMS</td>
</tr>
<tr>
<td></td>
<td>• Technology</td>
<td></td>
<td></td>
<td>• The survey link will be sent to students during the first week of class and they will be given until the beginning of the third week of class to complete the survey.</td>
</tr>
<tr>
<td></td>
<td>• Other Students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The Instructor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Workload</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Pre-</td>
<td>Experiences with:</td>
<td>• To determine the types of experiences that students had with the course. This survey can be compared to the pre-instruction survey to determine the level of differences between expectations and actual experiences.</td>
<td>All students in all OIPP courses</td>
<td>• Online survey.</td>
</tr>
<tr>
<td>Instruction</td>
<td>• The Course Structure</td>
<td></td>
<td></td>
<td>• Run on the LMS</td>
</tr>
<tr>
<td></td>
<td>• Technology</td>
<td></td>
<td></td>
<td>• The survey link will be sent to the one week prior to the end of instruction. They will have two weeks to complete.</td>
</tr>
<tr>
<td></td>
<td>• Other Students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The Instructor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Workload</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data</td>
<td>Content Elements</td>
<td>Purpose of Collection</td>
<td>Sample</td>
<td>Method For Collection and Timeline</td>
</tr>
<tr>
<td>----------------------</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<td>------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **OIPP Faculty**     | **Faculty Course Developers (Pre-Course Rollout)**                                | • To determine the logic of the course  
• To determine student learning outcomes  
• To gain insight into faculty expectations  
• To find possible improvements for future course developer experiences | All faculty who work on the development of the course. Mostly the Primary Investigators listed on the LOIs but may include other faculty. | • When possible, the interviews will be conducted in person, however, telephones and communication software such as Skype may be used  
• Follow-up interviews are expected, however, the range will probably be between a total of one and three interviews. |
|                      | Expectations for:  
• The Course (Generally)  
• Technology  
• Students in the Course  
• Workload  
Description of course pedagogy and curriculum  
Student Outcomes Expectations  
Perceptions of Online Learning |                                                                                                                                         |                                                                                               |                                                                                                |
| **Instructor Interviews (Post-Course Instruction)** | Description of Experience with:  
• The Course (Generally)  
• Technology  
• Student Interactions  
• Student Performance  
• Workload Level  
• Overall Experience  
Suggestions for Improvement | • To determine the types of experiences that different faculty had with their courses. These interviews could help supplement faculty surveys. | Selected Instructors (criteria to be determined) | • Interviews will be conducted immediately following the course.  
• It is expected that these interviews will be conducted by phone or through communication software such as Skype. |
| **Students**         | **Student Post-Instruction**                                                      | • To document student experiences in the courses.  
• Survey comparison  
• Formative assessment of course implementation and platform support  
• Evidence to support link of learning to learning tool  
• Identification of contexts in which tool was effective | Criteria Not Determined | • Student Recruitment and Notification: Not Determined  
• Interviews will be conducted immediately following the course.  
• It is expected that these interviews will be conducted by phone or through communication software such as Skype. |
|                      | Experiences of:  
• The Course Structure  
• Technology  
• Other Students  
• The Instructor  
• Workload  
Follow-Up on Survey Results |                                                                                                                                         |                                                                                               |                                                                                                |
### Table B2. (Continued)

<table>
<thead>
<tr>
<th>Data</th>
<th>Content Elements</th>
<th>Purpose of Collection</th>
<th>Sample</th>
<th>Method For Collection and Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **IT Early Interview** | Expectations for:  
- Faculty Course Developers  
- Instructors  
- Technology  
- Students  
- Administration  
- Workload |  
- To determine IT perceptions at the beginning of the project.  
- Formative assessment of the technology development  
- Formative assessment of organizational processes  
- Creation of IT logic model | All ITs |  
- When possible, the interviews will be conducted in person, however, telephones and communication software such as Skype may be used  
- Follow-up interviews are expected, however, the range will probably be between a total of one and three interviews. |
| **IT Long-Range Interviews** | Experiences with:  
- Faculty Course Developers  
- Instructors  
- Technology  
- Students  
- Administration  
- Workload |  
- To determine IT perceptions as the project moves forward.  
- Summative assessment of the technology development  
- Summative assessment of organizational processes  
- Checking accuracy of IT logic model | All ITs |  
- When possible, the interviews will be conducted in person, however, telephones and communication software such as Skype may be used  
- Follow-up interviews are expected. |
| **IDs** | | | | |
| **ID Early Interview** | Expectations of:  
- Faculty Course Developers  
- Instructors  
- Technology  
- Students  
- Administration  
- Workload |  
- To determine ID perceptions at the beginning of the project.  
- Formative assessment of the course development process  
- Formative assessment of organizational processes  
- Creation of ID logic model | All IDs |  
- When possible, the interviews will be conducted in person, however, telephones and communication software such as Skype may be used  
- Follow-up interviews are expected, however, the range will probably be between a total of one and three interviews. |
### Table B2. (Continued)

<table>
<thead>
<tr>
<th>ID Long-Range Interviews</th>
<th>Experiences with</th>
<th>To determine ID perceptions as the project moves forward.</th>
<th>All IDs</th>
<th>When possible, the interviews will be conducted in person, however, telephones and communication software such as Skype may be used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Faculty Course Developers</td>
<td>Summative assessment of the course development process</td>
<td></td>
<td>Follow-up interviews are expected.</td>
</tr>
<tr>
<td></td>
<td>Instructors</td>
<td>Summative assessment of organizational processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technology</td>
<td>Checking accuracy of ID logic model</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workload</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table B3. Document Data Collection Plan

<table>
<thead>
<tr>
<th>Data</th>
<th>Content Elements</th>
<th>Purpose of Collection</th>
<th>Sample</th>
<th>Method For Collection and Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E-mail</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC Online General E-mail:</td>
<td>Types of:</td>
<td>• To determine the types of inquiries and expectations of faculty</td>
<td>• All e-mails will be</td>
<td>• E-mails will be downloaded and</td>
</tr>
<tr>
<td><a href="mailto:uconline@ucop.edu">uconline@ucop.edu</a></td>
<td>• Inquiries</td>
<td></td>
<td>sorted and analyzed.</td>
<td>categorized.</td>
</tr>
<tr>
<td></td>
<td>• Responses from OMG</td>
<td></td>
<td></td>
<td>After initial categorization, e-mails will be analyzed for patterns and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unique ideas.</td>
</tr>
<tr>
<td><strong>Online Management Group (OMG) E-mails</strong></td>
<td>Types of:</td>
<td>• To determine the types of inquiries and expectations of faculty</td>
<td>• All e-mails will be</td>
<td>• E-mails will be downloaded and</td>
</tr>
<tr>
<td></td>
<td>• Inquiries</td>
<td></td>
<td>sorted and analyzed.</td>
<td>categorized.</td>
</tr>
<tr>
<td></td>
<td>• Responses from OMG</td>
<td></td>
<td></td>
<td>After initial categorization, e-mails will be analyzed for patterns and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unique ideas.</td>
</tr>
<tr>
<td><strong>ITs and IDs E-mails</strong></td>
<td>Types of:</td>
<td>• To determine the types of inquiries and expectations of faculty</td>
<td>• All e-mails will be</td>
<td>• E-mails will be downloaded and</td>
</tr>
<tr>
<td></td>
<td>• Inquiries</td>
<td></td>
<td>sorted and analyzed.</td>
<td>categorized.</td>
</tr>
<tr>
<td></td>
<td>• Responses from OMG</td>
<td></td>
<td></td>
<td>After initial categorization, e-mails will be analyzed for patterns and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unique ideas.</td>
</tr>
<tr>
<td><strong>Web Sites</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>External Web Site Documentation</strong></td>
<td>• All Pages</td>
<td>• To determine the type of information that is presented to the general public</td>
<td>• All Pages every 3</td>
<td>• All pages will be navigated to and PDFEd</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>months</td>
<td></td>
</tr>
<tr>
<td><strong>Internal Web Site Documentation</strong></td>
<td>• All Pages</td>
<td>• To determine the type of information that is shared on the site</td>
<td>• All Pages every 3</td>
<td>• All pages will be navigated to and PDFEd</td>
</tr>
<tr>
<td></td>
<td>• Open Communication from Faculty</td>
<td></td>
<td>months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Open Communication from UC Online Staff (OMG, IDs, ITs, other)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Table B3. (Continued)

<table>
<thead>
<tr>
<th>Data</th>
<th>Content Elements</th>
<th>Purpose of Collection</th>
<th>Sample</th>
<th>Method For Collection and Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOIs</strong></td>
<td></td>
<td>• Initial Conceptualizations of the course</td>
<td>• All accepted LOIs</td>
<td>• LOIs will be downloaded from proposalCENTRAL</td>
</tr>
<tr>
<td></td>
<td>Accepted Letters of Intent</td>
<td>• Learning Outcomes</td>
<td></td>
<td>• LOIs will be analyzed using qualitative software.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expected Uses of Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expected Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Roadmaps</strong></td>
<td></td>
<td>• Conceptualizations of the course</td>
<td>• All versions of Roadmaps that are submitted to OMG</td>
<td>• Roadmaps will be requested from OMG.</td>
</tr>
<tr>
<td>Early Roadmaps</td>
<td></td>
<td>• Learning Outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expected Uses of Technology</td>
<td>• Early roadmaps can be compared to the LOIs and Final Roadmaps to look for changes in design and conceptualization</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expected Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Roadmaps</td>
<td></td>
<td>• Conceptualizations of the course</td>
<td>• All accepted versions of Roadmaps</td>
<td>• Roadmaps will be requested from OMG.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Learning Outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expected Uses of Technology</td>
<td>• Final roadmaps can be compared to the LOIs and Early Roadmaps to look for changes in design and conceptualization</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expected Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meeting</strong></td>
<td></td>
<td>• Key items of importance for groups to address</td>
<td>• OMG Meetings</td>
<td>• Items collected and categorized after each meeting</td>
</tr>
<tr>
<td><strong>Agendas</strong></td>
<td></td>
<td>• Compare the issues addressed in meetings with what the particular groups articulate as important</td>
<td>• IT Meetings</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compare the issues addressed in meetings with what the particular groups articulate as important</td>
<td>• IDFS Meetings</td>
<td></td>
</tr>
<tr>
<td><strong>Memos</strong></td>
<td></td>
<td>• Identifies areas of critical importance and how those areas are to be communicated</td>
<td>• Faculty Senate Meetings</td>
<td>• Memos requested and archived</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compare the issues addressed in meetings with what the particular groups articulate as important</td>
<td>• Faculty Workshops</td>
<td></td>
</tr>
</tbody>
</table>
References


Dwyer, F. M. (1991). *A paradigm for generating curriculum design oriented research questions in distance education*. Second American Symposium Research in Distance Education, Pennsylvania State University, University Park, PA.


