Facilitating Program, Faculty, and Student Transformation: A Framework for Curriculum Redesign

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Facilitating program, faculty, and student transformation: A framework for curriculum redesign

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Abstract

Educational developers in a large research-extensive university have developed a customized curriculum redesign process, based on curriculum design and change literature, which has transformed faculty in teaching; transformed programs to meet the current knowledge, skills, and behavioral needs of students and employers; and transformed students' approach to learning. The redesign process has been optimized through multiple iterations in varying disciplines resulting in a recommended set of key steps or procedures comprising the redesign process. The key steps outlining the Curriculum Redesign Process Checklist (CRPC) inform a transformative process for developing faculty in teaching, designing a learner-centered curriculum, and enhancing student learning through high-impact practices and integrative learning ePortfolios. The newly designed curriculum better meets current needs of employers, potential graduate faculty, and student graduates. The purpose of this article is to describe each of the steps of the CRPC in detail so that other institutions can adapt the process to their individual needs in order to enhance transformative learning on multiple levels.

Although curriculum redesign might not appear to be a top priority at research institutions, various pressures accentuate its importance. Among the challenges facing higher education today, universities are encountering calls from the public for increased efficiency and accountability (Hubball & Burt, 2004). Students and their parents expect a more immediate return on their investment, and pressures exist to enroll and graduate more students due to shrinking budgets granted by state funding sources. Perhaps the most significant internal influence on curricular changes is the misalignment of courses and content due to the interpretation of course objectives by many instructors who have taught the courses over the years and made changes according to their perspectives and experience without considering overall program context (Diamond, 2008; Lattuca & Stark, 2009). These external pressures and internal misalignment are leading universities to take steps to engage in curricular reform in order to remain competitive, current, and effective. At the same time, there has been a shift to learner-centered approaches in pedagogies to bring "students to discover and construct knowledge for themselves" (Barr & Tagg, 1995, p. 15), and this is also prompting academic programs to revisit their curricula and assess their effectiveness. Undergoing curriculum redesign and assessment requires many resources and a great time commitment. So, why is there an increase in the number of programs engaging in these processes? The benefits of developing learner-centered curricula have been well-documented in the literature. Hubball and Burt (2004) explained some of these benefits, including the ability to

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- communicate program goals to various stakeholders and to the broader community;
- inform students of the skills and knowledge they can expect to obtain by graduating with a degree in a defined program;
- guide curriculum committees in determining course offerings;
- provide meaningful information to instructors as they design various aspects of their courses, such as learning outcomes, assessments, and teaching strategies.

Recognizing these benefits and motivated by external pressures and internal misalignment, programs are seeking support from teaching and learning centers in their efforts to redesign and assess their curricula. The center for teaching and learning on this research-intensive campus has been assisting with curriculum redesigns for several years and, in response to an increasing demand for these services, has developed methods for increasing the efficiency and effectiveness of these processes. Programs may use the process, which is customized to the context of large research institutions, as a framework to enhance their curricula and better meet the needs of their students and faculty. Because variation in institutional types plays a significant role in the way in which curriculum redesign is conducted, a description is provided of the institution in which this customized process was designed.

Curriculum redesign research

Curriculum development at the program level includes multiple components and is described variously in the literature as a process (Wolf, 2007), an academic plan (Lattuca & Stark, 2009), or a project (Diamond, 2008). The literature that informed the curriculum redesign process and checklist is grounded in the scholarship of teaching and learning and more specifically of curriculum and assessment, as well as research surrounding academic change (Holt, Armenakis, Field, & Harris, 2007; Jippes et al., 2013; Kezar, 2014). Three models of curriculum redesign were the major influences on the design of the Curriculum Redesign Process Checklist (CRPC).

First, according to Wolf (2007), curriculum development is a process that is faculty-driven, data-informed, and educational-developer-supported, all of which are critical to the success of a curriculum redesign. The model they describe includes curriculum visioning, development, and alignment of course objectives, content, and learning experiences. Wolf (2007) describes the importance of a faculty champion who can drive the process and can engage other faculty in participation and implementation. Data gathering engages faculty in meaningful ways and often inspires them to seek additional information through the literature or from colleagues in the same discipline. An educational developer can assist in keeping the process moving and can work toward "striking a balance between staying neutral in process facilitation while promoting scholarly approaches to teaching and learning in higher education" (Wolf, 2007, p. 19). A continuous cycle or plan is recommended to look continuously for improvements in the process as implementation occurs.

Next, Lattuca and Stark (2009) were looking for a comprehensive definition of curriculum and stated "our goal is conceptualizing curriculum as an academic plan is to identify

the critical decision points that, if effectively addressed, will enhance the academic experience of students" (p. 19). Within that plan they saw a need for decisions regarding 1) purposes; 2) content; 3) sequence; 4) learners; 5) instructional processes; 6) instructional resources; 7) evaluation; and 8) adjustment. They also described who is involved in the decision-making process for each step and thus who takes responsibility. Included in the academic plan are also potential influencers during the various stages of the plan. The plan "a) promotes clarity regarding influences; b) helps separate opportunities from constraints; c) creates focus on decisions needed; d) guides planning at all levels (unit, course, program, and college); e) targets attention to student learning; and f) offers dynamic view of curriculum development" (p. 21).

The final model influencing the curriculum redesign checklist described in this paper has two basic phases: "1) project selection and design; and 2) production, implementation, and evaluation, and was originally shaped by applying systems theory" (Diamond, 2008, p. 43). Although the process is designed in a sequential manner, Diamond asserts that some decisions cannot be made until relevant data are available, and flexibility is allowed in the model to overlap or move between stages. Five characteristics are described that distinguish the model, which "a) forces those using it to think in ideal terms; b) encourages the use of diagrams to show structure and content; c) relies heavily on the use of data; d) encourages a team approach; and e) is politically sensitive" (p. 43).

The institutional context

An institution's culture plays a significant role in the priority given to curriculum redesign efforts. For the purposes of transferability, it is important to provide a detailed description of the institutional context in which the curriculum redesign process has been refined. The target institution is a large research university with an enrollment of about 56,500 students and about 3,000 faculty members. Total research expenditures for the university exceeded $854 million in fiscal year 2014, demonstrating the university's strong emphasis on research. In addition, the reward structure for the university indicates that tenure-track and tenured faculty must have "a review that takes into account the fact that progress in a scholarly career is a long-term venture."[2] Although research appears to be the highest priority among the list of faculty responsibilities, recent university-led efforts have suggested an improvement in the methods used to evaluate teaching effectiveness as well as a higher priority placed on student engagement and learning.

One such effort, the Quality Enhancement Plan, clearly identified the need for more student engagement through increased involvement in high-impact educational practices (Kuh, 2008), and the described process purposefully meets this need. Furthermore, support for curriculum redesign is needed partly due to a lack of tools and training for faculty as well as the lack of a suitable framework and an effective process to implement and sustain curricular reform in academic units. The framework discussed in this paper including the associated tools and discipline-based approach for implementation, which promote faculty buy-in and sustainability,

[2] To maintain the agreed-upon confidentiality of the institution, a citation to its tenure and promotion guidelines has been omitted.

have been informally tested with several diverse programs. The authors of this manuscript, along with other members of the teaching and learning center staff, are currently engaged in research projects within multiple disciplines to determine the effectiveness of the framework and the quality of the tools. This paper serves as a theoretical foundation for work with additional programs, as well as a guide for other institutions interested in customizing their curriculum redesign process.

A curriculum redesign framework

Much learning happens at the course level when students are engaged in the learning process during the course through active learning (Fink, 2003). Before designing the course, however, considerable planning and designing of the curriculum at the program and institutional level typically occur (Diamond, 2008). How do pre-planning and overarching program design happen? What is the process, and who is involved? The approach depends on whether one is designing a new degree program that is being proposed for the first time or desires instead to redesign or update a current degree program. This paper will focus on the redesign of an existing program and explain how this process is a transformative learning experience for the faculty involved in the program redesign as well as for the students for whom the curriculum is intended.

Curriculum Redesign Process Checklist (CRPC)

Based on curriculum design literature (Diamond, 2008; Lattuca & Stark, 2009; Wolf, 2007), conversations with curriculum design experts, and multiple iterations in varying disciplines on the campus, a customized checklist outlining the process was created. The Curriculum Redesign Process Checklist (CRPC) encompasses nine major steps and a toolkit of templates that assist in completing each step, as outlined in Table 1.

Table 1
Process Steps and Available Templates

CRPC Steps	**Helpful Templates**
1) Orientation and team formation	a) change readiness questionnaire
2) Internal data gathering	b) survey templates for gathering data
3) External data gathering	b) survey templates for gathering data; c) peer institution templates
4) Program-level learning outcomes development and performance criteria designed in the form of rubrics	d) rubric template
5) Curriculum map development	e) curriculum matrix template
6) Supplementary curricular materials creation	f) course design worksheet; g) syllabus template; h) high-impact practice and technology use matrix
7) Implementation plan creation	i) considerations documents
8) Assessment plan creation	j) assessment plan template; and k) implementation plan template including professional development needs and communication plans
9) Updated curriculum implementation	

Together with the CRPC, the designed templates help to bring about transformation at the program level. Transformative learning has been described as meaning-making through reflection and dialogue (Merriam, Caffarella, & Baumgartner, 2007). Using transformative learning research, suggestions are proposed for several areas in which faculty and student learning takes place. These areas have the potential to be transformed by incorporating reflection throughout the curriculum. Such transformative learning would allow for meaningful change within a program and support the overall goal of improved student learning. The paper will demonstrate how each step in the CRPC corresponds to a phase in Mezirow's (1975) transformative learning process, emphasizing how a well-designed curriculum can be meaningful for faculty and can constitute the heart of a student's college experience. The checklist serves many purposes including illustrating to those considering a redesign of current degree programs the amount of effort required by this process. Each step in the CRPC will be described in further detail.

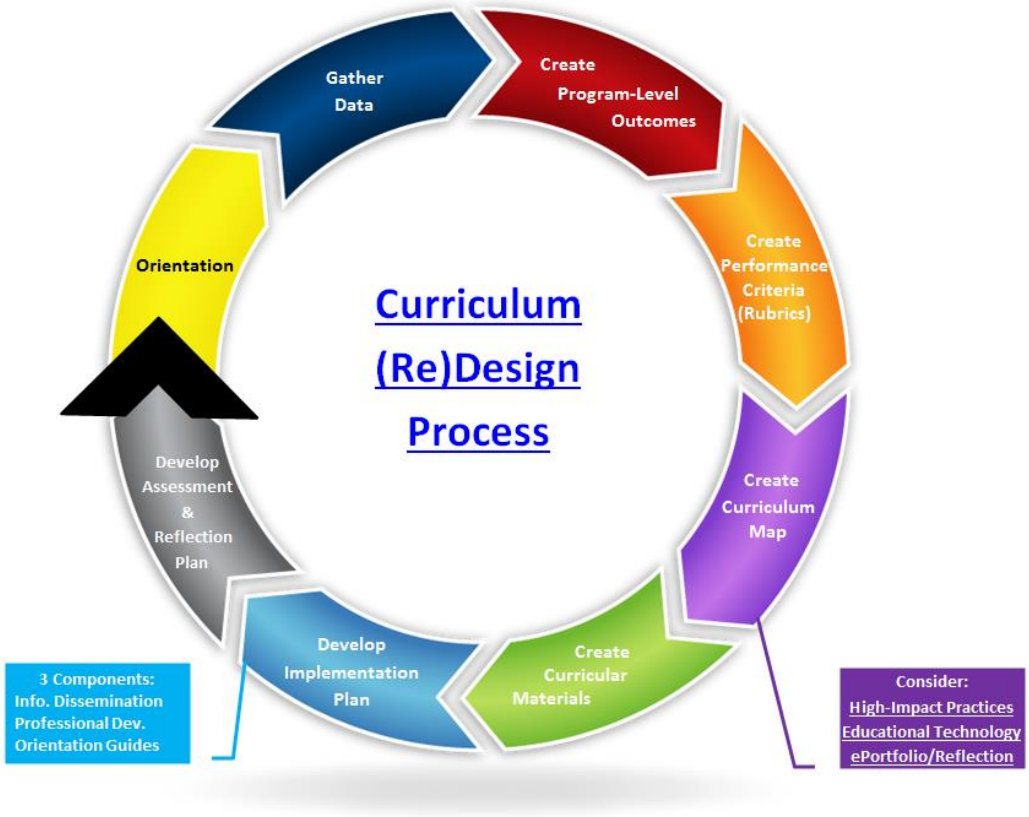


Figure 1. Curriculum (re)design process. The curriculum redesign process is cyclical and involves eight components.

Step 1) Orientation and team formation. The CRPC process begins by assembling a team that will be involved in the curriculum redesign for a consistent, non-trivial amount of time often ranging from eighteen months to two years. The process involves a sustained effort by a

core group of educators including instructors teaching the courses, advisors directing students entering and progressing through the specified program, students who have recently completed the program or are near the end of the program, current graduate students who have graduated from the program, a department administrator, an educational developer, and someone who provides administrative support throughout the process (Diamond, 2008; Wolf, 2007). Department leadership can show support for the process by hiring a graduate student from their college or the college of education to provide support with survey development, agenda planning, meeting minutes, peer institution research, and the like. Graduate student support of this nature has been key to the success of many programs with which the faculty development center has worked. Utilizing a graduate student in this role also ensures twenty hours per week will be dedicated to the project and that foundational knowledge either in the program discipline or in pedagogy will be in place.

Undertaking a curriculum redesign is a major change initiative. One component of the redesign process is to determine the department's readiness for change. This initial step is crucial in beginning the transformative learning process. The first few phases of Mezirow's (1975) transformative learning process involve a self-examination and critical assessment of one's assumptions. The readiness for change questionnaire allows for such an exploration by asking the faculty to identify the reasons why the program is considering engaging in a curriculum redesign process (Holt et al., 2007; Jippes et al., 2013). Taking stock of the motivating factors and driving forces helps the team assess their readiness and serves as the springboard for further action.

In an effort to determine readiness for change, the identified core team is asked to complete the readiness for change questionnaire (Holt et al., 2007; Jippes et al., 2013), confirm department or college leadership support, and review the CRPC and expectations with the assistance of a faculty developer from their center for faculty development. Once agreement on proceeding with the process has been established, common understanding of the steps in the process is confirmed with the team including the creation of goals and a timeline. The first meetings with the core group may incorporate activities designed to establish trust and guidelines for interaction throughout the process. If these actions are left unaddressed, conflict can arise and can lead to larger conflict issues later in the process (Kezar, 2014). The early sessions of orientation are also a good time to establish a documented communication plan, which will keep outside faculty members, administrators, and students abreast of the progress as the team creates their curriculum redesign. The communication plan should also outline agreements such as how the team will communicate and how often they will communicate.

At the same time, institutions and state governments require detailed documentation for curricular change, thus, it is important to determine what those requirements and timeline are early in the redesign process in order to be better prepared to comply with those requirements and to provide the necessary documentation. The State Higher Education Coordinating Board is one example of such a governing body. The core team is encouraged to seek out the curricular services office on campus to determine requirements for institutional and governmental compliance at this stage.

Step 2) Internal data gathering. A part of the internal data gathering process includes learning what decisions, policies, or standards influenced the current curriculum. This

item on the data gathering agenda is to determine the strengths and weaknesses of the existing program. What is working and what is not working according to the faculty, current or graduating students, and advisors of the students? The internal data gives a good idea of gaps that may exist and of areas of focus in which the pedagogy could be enhanced; data indicating the desired attributes of the graduates may be acquired from potential future employers and potential graduate faculty (external data gathering) who will accept the graduates into their graduate programs (Diamond, 2008; Lattuca & Stark, 2009; Wolf, 2007).

Mezirow (1975) described the role that a disorienting dilemma plays in the transformative learning process and suggested that gathering new information, reflecting on that information, and engaging in rational discourse with others is important to the meaning-making process. As learners integrate this new information into their changing perspectives, transformative learning begins to occur. Data gathering in the curriculum redesign process serves a similar purpose. These data are the new information that faculty members should analyze and consider as they decide which changes to make in the curriculum. Although faculty might experience the curriculum in a certain manner, the data might reflect a different picture—one in which there are gaps in the students' knowledge or other inconsistencies within the program. The data gathering phase often creates a disorienting dilemma but helps the team to explore new possibilities and provides further motivation for change. Oftentimes, this process is the first time faculty have engaged in conversations with each other about what is being taught in their courses.

Step 3) External data gathering. External data gathering takes many forms including conducting a literature review of existing publications within the discipline of the program undergoing the curriculum redesign (Diamond, 2008; Lattuca & Stark, 2009; Wolf, 2007). In addition, much data can be gleaned from peer institution websites regarding key focus areas of their programs and innovative pedagogy that is enhancing the learning experience. In some cases, program-level learning outcomes are listed on peer institutions' websites and provide models of the format that is desired in the next step of designing program-level learning outcomes

Discipline-specific accreditation requirements may exist depending on the program discipline under review (Lattuca & Stark, 2009; Wolf, 2007). For example in engineering, ABET requirements (ABET) inform the expectations for engineering, while in civil engineering the Body of Knowledge learning outcome expectations further inform the program-level focus (ASCE). At the same time, regional accreditation requirements exist for all programs of an institution based in a specific region within the United States. Achieving a thorough understanding of the accreditation requirements including regional accreditation (for example, Middle States Commission on Higher Education) requirements is important when designing program outcomes, as defined program outcomes and assessments will be reviewed during an accreditation review and site visit.

External survey data from employers, graduates of the program, and graduate school professors considering applicants from the program in question inform the curriculum from another perspective. Seeking feedback from these individuals can enhance the employment potential of current students by identifying knowledge and skills that students are expected to acquire in their program (Suskie, 2004; Wolf, 2007). This group of employers, former students,

and potential graduate professors are able to highlight shortfalls in knowledge and essential skills that may not have already been identified. Additional external documents that may inform the curriculum from a more pedagogical perspective are those related to high-impact practices and ePortfolios. High-impact learning is a more active and extended learning experience that influences the student at a deeper level of learning (Kuh, 2008). Electronic portfolios, or ePortfolios, serve several purposes in enhancing student learning: 1) through the use of written reflections, the material included in an ePortfolio can enhance critical thinking for the students (Light, Chen, & Ittelson, 2012); and 2) ePortfolios allow students to make connections in their learning that they would not otherwise make. These connections can be related to the way students will utilize the learned knowledge and skills in the future.

Experience on this campus shows that exposing members of the core curriculum design team to effective pedagogical approaches throughout the process begins to transform their thinking regarding teaching and learning. Reading articles by organizations such as the Association of American Colleges and Universities related to high-impact practices and looking to other institutions for examples of how high-impact practices have been implemented help the instructors to see the usefulness of these practices and to understand better the characteristics that define a high-impact practice (Brownell & Swaner, 2009). ePortfolio literature is infused at this stage to help the instructors see the value of reflection in enhancing critical thinking in order to provide a focus for integrated and lifelong learning through the ePortfolio (Chen, 2009).

Step 4) Program-level learning outcomes development and performance criteria designed in the form of rubrics. Internal and external data gathering have helped to define the knowledge, skills, and values that a new graduate of the degree program should have attained. The final list of attributes describe 'the ideal graduate' (Diamond, 2008; Wolf, 2007). The knowledge, skills, and values will be more usable in learning outcome format (action verb and subject) so that the core team can determine what the students will know and be able to do when they graduate. If a set of learning outcomes does not exist, then a list of required content knowledge, skills, and values or attitudes is created and a survey designed based on that list (Jarvis, Collett, Wingenbach, Heilman, & Fowler, 2012). The surveys are administered to all stakeholders, and follow-up focus groups are scheduled as needed to gather more in-depth information (Fowler, Anthony, Poling, Morgan, & Brumbelow, 2014). A set of proposed program-level learning outcomes is then created.

At this stage of the process, a common practice is to conduct a workshop on creating learning outcomes at both the course and the program levels. Bloom's taxonomy and Wolcott-Lynch's Steps for Better Thinking (Lynch, Wolcott, & Huber, 2001) are introduced to help instructors grasp the desired levels of cognitive thinking and the ways one might describe them through the various levels of action verbs. As mentioned earlier, the continuous introduction of varying pedagogical strategies continues to transform the instructors' thinking regarding teaching and learning. A pre- and post- survey regarding the faculty's perspective on their teaching has been administered in one of the current curriculum redesigns to determine how much change has occurred in their pedagogical approaches and thinking.

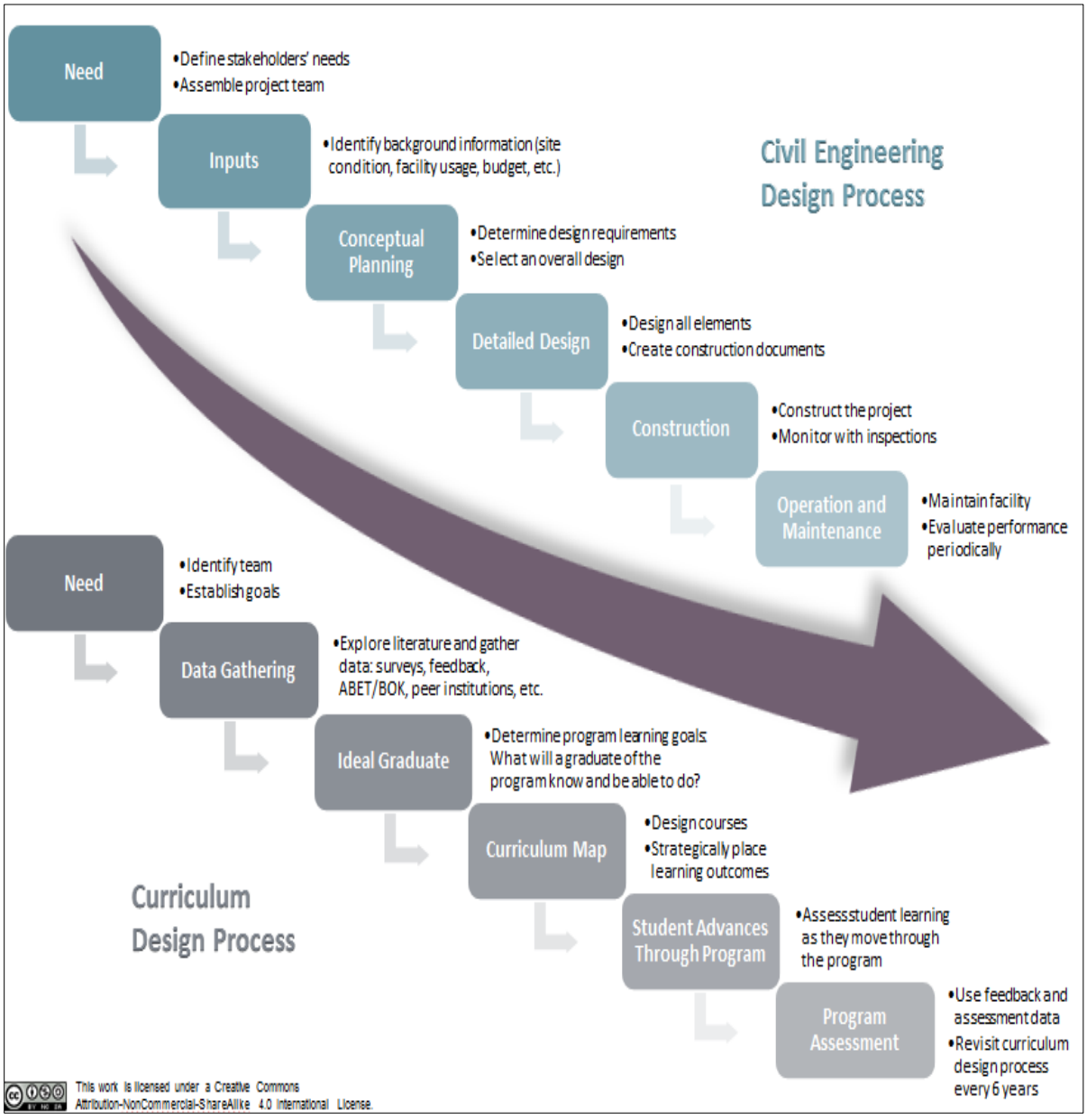
Once the program-level learning outcomes are established, the dimensions and developmental levels of achieving them are articulated through rubrics. Creating the rubrics to define further the program-level learning outcomes was originally done at the assessment stage,

but through several iterations of utilizing the checklist, it was found more beneficial to move the creation of the rubrics to an earlier point in the process because by the time that the assessment stage was reached, the faculty had lost momentum for such an intensely detailed process as rubric creation. The rubrics continue to be refined as they are used, and some departments have found additional uses for them, including as a diagnostic tool for their students as they enter the degree program. Feedback is recommended from all faculty teaching in the curriculum at this stage, as throughout the process. Feedback is typically received through electronic surveys, as well as through documents placed on a share drive for all to access and give feedback and through one-on-one or small group conversations. Feedback from faculty who are not on the curriculum redesign team is essential not only because of the lens and expertise they bring to the process, but also because it helps ensure support for the recommended changes to the curriculum.

Gathering the internal and external data as well as creating the rubrics requires multiple team sessions and one-on-one meetings with faculty. Some faculty become discouraged with the redesign process at this point and desire to know why it is necessary to gather the large amount of data and create the rubrics. It is important at this stage to introduce a graphic analogy illustrating the relationship of the curriculum redesign process to a process within their discipline. The following example of such an analogy is taken from a curriculum redesign in civil engineering, where the civil engineering design process was illustrated and juxtaposed to the curriculum design process (Fowler et.al, 2014). The curriculum redesign process was shown to have steps similar to those of the civil engineering design process. This helped convince the civil engineering faculty that the process follows a logical pattern, including the next step of curriculum mapping.

Step 5) Curriculum map development. Excitement begins to build among faculty as they now are in the process of designing courses and learning experiences for their potential students. Uchiyama and Radin (2009) describe the surprising amount of collegiality and collaboration during the curriculum mapping process. The process begins by placing the program-level learning outcomes on the left-hand side of a matrix and placing the course numbers or equivalent number of hours across the top of the matrix (or in opposite positions, based on preference) as displayed in Table 2. Typically, the set of program-level outcomes contains several disciplinary content outcomes and several general skills (sometimes termed professional or general skills) such as communication, critical thinking, multicultural awareness, etc. Faculty typically gravitate toward designing courses incorporating these disciplinary skills. The process has been adapted to indicate that each course must contain from one to three of the general skills to enhance the achievement of the disciplinary content based on the need to address content mastery and the development of cognitive abilities (Fowler, Froyd, & Layne, 2010; Bath, Smith, Stein, & Swann, 2004). Faculty are often not comfortable with the incorporation of the general skills, but through examples and discussion with colleagues, they are able to include additional skills. The process does not stop here, however, as the skills that are listed on the curriculum map and selected for incorporation into a course now must be included in course learning outcomes and instructional methods and must ultimately be assessed (Fink, 2003).

Figure 2.
Design process analogy.
This figure represents the civil engineering design process juxtaposed to the curriculum redesign process.



The curriculum map typically has three components: the core courses or common core (often taught outside of the department), the core department courses (taught to all students within the department, although there may be more than one degree program), and degree program courses

unique to each degree program or specialty core. The department core and the specialty core often incorporate educational experiences such as internships, study abroad opportunities, and undergraduate research that may absorb some of the credit hours. Departments in a four-year institution that have many transfer students entering at the second-year level can incorporate what is termed a leveling course to ensure that students come in with the necessary foundational knowledge within the discipline. The leveling course also offers an opportunity to introduce the ePortfolio to transfer students who may not have initiated the process of creating one at their former institutions

Table 2
Curriculum Mapping Template

Program Learning Outcomes	**University Core Curriculum**			**Department Core Curriculum**			**Program Specialty Curriculum**			**High-Impact Experience(s)**		
	core course 1	core course 2	core course 3	dept core 1	dept core 2	dept core 3	spec course 1	spec course 2	spec course 3	exp 1	exp 2	exp 3
Discipline Content	Introduce			Reinforce			Demonstrate			Reinforce		
Discipline Content	Introduce			Reinforce			Demonstrate			Demonstrate		
Cognitive Skill	Introduce			Reinforce			Demonstrate			Reinforce		
Cognitive Skill	Introduce			Reinforce			Demonstrate			Demonstrate		
Habit of Mind	Introduce			Reinforce			Demonstrate			Reinforce		
Habit of Mind	Introduce			Reinforce			Demonstrate			Demonstrate		

Once all of the program-level learning outcomes have been incorporated into the established courses, the instructors determine where the outcomes are introduced into the curriculum (I), reinforced in more than once course (R), and ultimately demonstrated for program assessment purposes (D) (Diamond, 2008). It is important to emphasize to the instructors that even though evidence may be obtained for the achievement of the program-level outcome only in the courses where those outcomes are demonstrated, if the program-level outcome is introduced or reinforced in a course, it must be assessed at the course level (Diamond, 2008). This is an ideal time to confirm the necessary match for course sequencing and the IRD matrix.

Additional key objectives of the curriculum map stage are: a) to ensure that high-impact practices are incorporated, b) to discuss which courses will provide artifacts to be included in students' ePortfolios, and c) to identify interdisciplinary experiences and their influence on the curriculum. The inclusion of such experiences in the curriculum is necessary because of their transformative power. Engaging in high-impact experiences and articulating their learning in an

ePortfolio enables students to reflect critically on those experiences, thereby enhancing and transforming their learning (Alfred, Cherrstrom, Robinson, & Friday, 2013). Embedding these experiences and designing their sequence allows for creativity in the design of the curriculum. Suggested questions the committee can consider at this stage in the process include: Are there gaps in some program-level learning outcomes across the curriculum? Are there redundancies of program-level learning outcomes? Returning to the data that was obtained, have all of the defined needs been met?

A component that may be missed unless purposely discussed with the core curriculum team is how technology will be used to implement the curriculum. Questions to consider here include: Will courses be offered in different formats to allow for more engagement on the part of the students? Which courses will be offered online? If an institution utilizes a learning management system, are the faculty utilizing it to its optimum capacity? How does the proposed curriculum accommodate growth? Feedback is received from other faculty teaching the courses and experiences in the curriculum, and more detailed materials regarding the courses and experiences may then be created.

Step 6) Supplementary curricular materials creation. Supplemental course information sheets are helpful in that they are created to include the program-level learning outcomes that have been proposed on the curriculum map. This will help to ensure that the original plan regarding the program-level outcomes is not lost. Program-level outcomes will be listed, together with the type of evidence that will be used to determine whether the program-level outcomes have been met. The instructor can then use the rubrics to help define the course-level outcomes that might be included in the course. A section of the course information sheet is dedicated to identifying the high-impact practice(s) that may be incorporated into the course. Realistically, two high-impact practices per semester are the optimum to achieve the level of learning that one would desire in high-impact practice (Kuh, 2008). Another section of the information sheet is dedicated to describing the reflection component that will be incorporated into the course and ideally will include the actual reflection questions that will be asked of the student. The information sheet also indicates whether or not artifacts described on the information sheet are expected to be included in the ePortfolio.

Supplemental course materials can be located on a common website for easy access and dissemination[3]. Experience indicates that the course materials would best be located on a department or college shared drive so as to be easily accessible for an accreditation visit or for sharing with new instructors. Programs need to consider that institutions and state governments have defined processes for curricular updates. At this stage, there may be required documentation and a timeline for this process. Programs should check their institution's curricular services website for this information.

Step 7) Implementation plan creation. When the course information sheets are developed in step 6, it is not uncommon for staff to think of additional details that may influence

[3] https://sites.google.com/a/tamu.edu/program-curriculum/.

the curriculum map, and documents may therefore be updated as the redesign progresses. Now is a good time to go back and reevaluate the curriculum map to ensure that all gaps and redundancies have been addressed, that high-impact practices have been incorporated, and that ePortfolio evidence has been identified. The program-level learning outcomes, rubrics, and curriculum map will be shared with future students, parents, new instructors, advisors, and potentially any individual who may have an interest in the curriculum. For this reason, ensuring the accuracy of the materials is important. This would also be a good time to seek feedback from key stakeholders such as instructors who may have missed an opportunity to provide feedback earlier in the process or advisory board members who have an interest in the program.

The implementation plan should incorporate a detailed communication plan as well as a marketing plan for new students, advisors, and recruiters wishing to share the details of the program. Advisors will need materials that assist in describing the expectations of the program and the sequencing of courses. Questions to ask at this point in the redesign process include: What additional documents may be helpful? How will changes to the curriculum be documented and communicated? Who is accountable for the new curriculum?

Second, the implementation plan should address the professional development needs for faculty or graduate students who might be teaching the courses. A self-reflection template related to the key components of teaching a course will help the instructors to identify professional development needs that may exist. Content gaps must be identified to determine future instructor needs. Content that is outdated or no longer needed should be removed from the curriculum at the course level.

Finally, dissemination should be included as part of the implementation plan. Perhaps there is a disciplinary education journal that would benefit from learning about the changes that are being proposed in the new curriculum. The following questions will guide this part of the process: How would faculty conducting the redesign have benefited if someone had published such information before they began the curriculum update? Has the program incorporated scholarly changes that may advance the field?

Step 8) Assessment plan creation. A curriculum redesign is not complete until a process is in place to determine the effectiveness of the changes (Diamond, 2008). Each of the program-level outcomes should have example(s) of evidence of performance. At this point, it should merely be a matter of consolidating the required information, much of which was compiled for the course information sheets. The format for the assessment plan may be dictated by the format used at the institution. An assessment plan is expected for regional and/or disciplinary accreditation purposes.

An assessment team convening on a semester basis to review the evidence and previously created rubrics assists in determining the level of achievement of the students. Not all evidence from every course must be collected, but experience dictates that an appropriate sample size representing the graduating cohort is important. Assessment team assignments should be made on a rotating basis to allow for broader exposure to the results and to alleviate burn-out. The overall curriculum design should be revisited on a regular basis.

Step 9) Updated curriculum implementation. In this final step, the new curriculum materials are shared with potential and incoming students, and the new courses are taught. New

faculty are oriented as they are hired or teach a course for the first time. Resource materials exist for all stakeholders involved (students, instructors, advisors, parents, etc.), and an individual is accountable for the process and available to address questions as they arise.

Conclusion

Mezirow's transformative learning process "encompasses four main components: experience, critical reflection, reflective discourse, and action" (Alfred et al., 2013). The framework for curriculum redesign uses these transformative learning components at various stages of curriculum redesign to impact both faculty and students. For the core faculty on the curriculum redesign team, critical reflection will occur as they engage with some of our tools, such as the readiness for change questionnaire; as they grapple with the data gathered in the initial stages; and as they move from course-level to program-level design thinking. The faculty are also regularly involved in reflective discourse with their colleagues as they brainstorm ways to improve the program, think deeply about the purpose of their program, and discuss which learning outcomes their students should demonstrate. This reflection and discourse leads to action, in which the team engages in a data-driven redesign of the curriculum. The curriculum framework, in turn, embeds experiences such as high-impact practices that expose students to disorienting dilemmas (Mezirow, 1975) and an ePortfolio that encourages them to reflect critically on their learning (Alfred et al., 2013).

Future implementation and research

The curriculum redesign process introduced in this paper intentionally embeds the components involved in transformative learning. These components, however, were derived from past research on transformative learning, and they have not been tested against this specific process. With that in mind, one current research project involves examining how some of the tools, such as the readiness for change questionnaire, can lead to transformative learning. In addition, each graduate student working on a curriculum redesign for a department is conducting discipline-specific research in collaboration with faculty on the curriculum redesign team and faculty members from within the discipline. If one should choose to adopt this process for future implementation, program leadership is encouraged to consider carefully the context of the institution and to document any necessary adaptations to the process based on that context.

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