ADDIE in Action: A Transformational Course Redesign Process

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Abstract

Online teaching and learning has evolved over the past two decades into a viable and respected means to higher education, with many undergraduate and graduate courses now offered in this format. While the popularity of online coursework has resulted in increased online enrollment and offerings, often the course design, strategy selection, student workload and learning relevance has lagged behind in comparison. As additional research becomes available into how to motivate and engage the online learner and how to best prepare online courses for optimum student success, universities may be faced with opportunities to redesign already existing online courses to best meet the research-based advances of online teaching and learning.

During the 2018-2019 and 2019-2020 academic years, one School of Education at a southeastern university engaged in this very discussion and process of redesigning and transforming already existent online courses. Using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) educational process as a guiding protocol, university leaders, instructors and course designers engaged in aligning online courses in a Master of Arts in Educational Leadership program with best 21st century practices and online learning research. This article outlines a representation of that journey: the research, the reasoning, and the results.

Keywords: Course Redesign, Curriculum, Leadership, Online Learning

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Introduction

In considering the design of any online course, there are well-established best practices for traditional teaching and learning that translate and apply effectively into the online environment. In fact, much of the research emphasizes the need for consistency in best practices regardless of the modality. It has been recommended that instructors of both traditional and online courses should embed the following six foundational principles into any course design model: 1) peer-to-peer interaction; 2) active student engagement; 3) practice and emphasis on effort; 4) personalization; 5) variety; and 6) higher order thinking processes (Lang, 2014; Miller, 2014). These practices echo those established much earlier by Chickering and Gamson in their "foundational seven principles for an effective undergraduate education", which included 1) contact between students and faculty; 2) development of reciprocity and cooperation among students, 3) encouragement of active learning; 4) prompt feedback; 5) emphasis of time on task; 6) communication of high expectations and 7) respect for diverse talents and ways of learning (Chickering & Gamson, 1987). As part of this research the authors also concluded: These principles seem like good common sense, and they are -- because many teachers and students have experienced them and because research supports them. They rest on 50 years of research on the way teachers teach and students learn, how students work and play with one another, and how students and faculty talk to each other (1987, p. 2)

While these foundational principles were part of early research in this area, Chickering and Ehrmann adapted this outlook to online learning in later writings in which technology was viewed as a platform by which to accomplish these same timeless education practices (1996).

In considering the research recommendations related to the first of these best practices, peer-to-peer interaction may at first glance seem the most difficult to attain in an online environment. As opposed to traditional educational settings in which actual people are sitting side-by-side and engaging in interpersonal communication and collaboration, online learning exists in a digital environment, one made up of screens in the privacy of one's home or business. Perhaps because of this stark contrast, recent research emphasizes the critical need for online courses and teaching to allow for this peer connection. Online learning frameworks in which learners are given opportunities to motivate each other and to monitor one another's metacognition and learning as shared through a community of learners is most effective (Niess & Gillow-Wiles, 2013). Opportunities to reflect with peers cannot be limited to course content, but must also include a platform for broader social interaction (McLeod, Barr & Welch, 2015). As students interact while engaged in learning tasks they become engaged members of their own social learning course community and are better able to connect course content to real world experiences. In addition to improving student learning and success, a deliberate design which allows for peer-to-peer interaction may actually prevent the often experienced feelings of isolation and disconnect with course content that are often part of the online learning experience.

Even as these best practices for online learning are clearly established, it should be recognized that online teaching and learning can and does present its own set of challenges. In a synthesis of online teaching and learning, Kebritchi et al. (2017) identified three specific areas associated with online teaching and learning challenges: issues related to online students, issues related to online instructors, and issues related to online course development. In specific regards to online course development, poorly designed courses may result in low engagement and a negative overall impact on student learning. As shared by Soto (2013), "effective online learning is dependent upon the principles of instructional design and development" (p.2).

While acknowledgement of the importance of effective online course design may be a helpful starting point, the logical next step would be sound principles and strategies by which to prepare for and overcome any design barriers to online student success. The following is an examination of the process that may be taken in redesigning online courses in a manner that is consistent with research and best practices and which sets sound principles in place for online student learning. The process used is aligned with the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) Model, an instructional design method that has been used for many years as a framework for designing and developing educational programs (Kurt, 2017). The ADDIE model has been recognized as the most commonly used instructional model for virtual teaching and learning and thus was selected for this endeavor (Soto, 2013). The effective use of this model in the online course redesign and the opportunities that a redesign endeavor presents in terms of increased student engagement and learning is examined here. Research aligned with the planning behind the process and actual engagement as experienced by the School of Education and the university in our own redesign journey is shared.

<u>A</u>DDIE: Analyze

The first step in any process is to ascertain the current state of operations, and so it is with the online course redesign process. A deep analysis of all aspects of a course or a program reveals much – some of which may be expected, some of which may be painful to accept, and some of which may be enlightening or affirming. During this stage, it is imperative that the

redesign leader access any and all quantitative and qualitative data, observations, or information available to help form this realistic picture of the current course or program. Student surveys, time-on task analyses, faculty input and course or program success rates are just a few of the sources that may prove helpful during this first step. Rather than attempt to justify data that indicates problematic areas, course designers may use this often uncomfortable process to instigate and drive needed change.

Our ADDIE Journey: The Analysis Phase

The analysis stage was one based on a variety of qualitative and quantitative data. Student surveys and input showed general satisfaction with the program; however, on numerous occasions students shared feedback regarding the preponderance of formal papers in the program and the reliance of reading and writing (in the content courses) rather than practicing and reflecting. Other student feedback indicated a desire to be more connected with faculty and students and the overall monotony of weekly tasks. While the course structure was previously standardized for efficient navigation for the student, this also potentially led to replication in how learning was experienced. Capstone work and other assessment tools demonstrated a high level of student mastery and proficiency, yet instructors recognized that ongoing research into online teaching and learning presented opportunities for improvement. Source analysis revealed course articles and resources that were on the verge of lacking current relevancy. Assignment analysis showed a dominance of more traditional, lower-order instructional strategies.

Conducting a time-on-task (student workload) study is a critical component of the analysis stage. Regardless of the chosen instructional strategies utilized in the online course design, an analysis of the level of rigor and the degree to which this translates in terms of workload for students is a valuable step in this first phase. The Carnegie Foundation recommended workload hours for online courses (of the 8-week duration format) is 135 hours (US Department of Education, 2008). For our redesign experience, an analysis of every element of the course, including readings, assignments, and discussions, revealed that current programmatic hours were well below the Carnegie Foundation recommended formulas, suggesting the more traditional strategies were leading to less engagement and more surface-level dives into learning topics.

Another analysis component for this stage of redesign is learning objective and activity alignment. At the university level, this process included a close and careful study of the weekly, course, and programmatic learning outcomes and how tightly these were aligning. In addition, for each activity included in the online course, an identification of the specific objectives relevant to each instructional activity was involved, with gaps in matching an indication of lack of alignment. This learning objective analysis was also key in the latter phases of design and development.

At this point, armed with the plethora of data, feedback, objective alignment examination, source relevancy, and fully immersed in the research base regarding online course design and online learner success, the university design team was ready to move on to phase two.

ADDIE: Design

Following a careful and comprehensive analysis, the design phase then begins. An analysis- and research-driven online course design may lead to increased student and instructor engagement and overall student success in the online learning environment. First and foremost, online course design must be geared towards optimum student engagement, a key principle to be considered along with higher order thinking strategies, peer-to-peer interaction, emphasis on practice and a variety of activities (Miller, 2014). These foundational best practices, when included in the online course design, lead to active learning on the part of the online student, as

opposed to the passive learning often associated with more traditional teaching models.

Peer interaction is particularly important in the design of the online course, as students are not sitting in a face-to-face classroom where conversation and camaraderie develops naturally. Miles, state lines, or even oceans may separate online students from one another. The design of the course in specifically allowing and driving student collaboration and discussion is key. The notion of online students as a learning community is grounded in the social metacognitive constructivist learning framework (Neiss & Gillow-Wiles, 2013). In the online environment, student connections may be just as strong a factor in learning as pedagogical approaches (Maki & Maki, 2007). A purposeful design that allows for interactions by which students may demonstrate and share their metacognition and even monitor each other's learning may lead to improved engagement and higher student motivation.

Other course elements to be considered in the online course design phase involve the selection of and decisions regarding the use of multimedia. While online teaching and learning is a technology-based educational format, course designers must avoid the temptation to overuse multimedia tools simply for the sake of using what is available. Online course redesign allows for the careful consideration of the most current software and programmatic tools and the strategic implementation of such strategies. Videos and games may add elements of play and enjoyment for students, but these multimedia tools should not be integrated just for the sake of having more "gadgets" in the course. Rather, multimedia tools should be selected and included when they clearly add to the presentation and relevance of the online course content and the learning progression of the student (Kebritchi et al., 2017; Mayer, 2014). Through research on multimedia learning theory, Mayer (2014) shares the three approaches available when making multimedia design decision: less-is-more, more-is-more, and focused-more-is-more. The progression from less to more includes removal of unnecessary information in order to lessen distractions, the addition of interesting elements such as graphics, and the ability for students to be engaged in multimedia tools involving challenging learning scenarios (Mayer, 2014).

In making design decisions it is realistic to assume that students who are beginning an online learning journey may lack understanding of the learner strategies that may be successful in aiding student success. Wander, Imbriale, and others suggest that learning strategies that are controlled by the learner themselves, or self-regulated learning strategies (SRLS), should be promoted in online courses due to their clear link to improving online student success (Anderton, 2006; Wander & Imbriale, 2017). Earlier research by McMahon and Luca shared that these very types of learning strategies are in high demand in today's job market (2001). Additional SRLS research suggests that online students who utilize and regulate their own learning strategies, such as goal-setting and time management, often realize positive outcomes. (Barnard-Brak, Lan & Paton, 2010; Barnard, Lan, To, Paton & Lai, 2009). With the potential for such a profound impact on student success, an introduction to SRLS and a sharing of SRLS resources would prove an appropriate and effective learner readiness tool.

Another consideration for course design decisions is the balance of active and passive learning. Active learning, such as rigorous discussion with peers, exploratory labs, group projects and application activities hold the potential to spark student interest and engagement more readily than passive activities, such as independent reading, viewing videos or completing assessments Research by Dixson (2010) suggests that the ability of active learning to increase social presence and student interaction positively impacts student engagement in the course. Similarly, research conducted specifically with online graduate students found that higher level analytical work resulted in higher student engagement in online courses (Robinson & Hullinger,

2008). Decisions made in the course design phase that improve the social presence of participants may lead to high student engagement once the course is live and active (Ladyshewsky, 2013).

Additionally, course relevancy is a key to online student engagement, as students will have higher interest and motivation to learn in environments that are aligned to educational and professional needs. Briggs (2015) suggested through online course design research that careful attention be paid to media, modalities, pacing, variety, and how all may be deliberately structured to lead to high relevancy and, ultimately, increased student engagement in online learning.

Our ADDIE Journey: The Design Phase

In beginning the design phase, it was an important foundational step to establish, based on research and our analysis, the exact course design vision for the program. Making sound, research-based decisions early on that would serve as an umbrella for every course in the program would ensure consistency in design principles and in assignment choices. This "course redesign guide" served as a formal guiding document throughout the redesign process, and one that dictated the answers to such questions as "how many posts will we expect for discussion questions" and "how will we scaffold our course assignments?"

Reflecting back on our analysis phase (the A in ADDIE), and synthesizing all of the analysis feedback and data that had been considered, we had a comprehensive list of desired outcomes and design principles (Table 1 below).

Table 1
Desired Outcomes and Principles

Student Feedback	Research
Reduction in papers and discussion threads	Collaborative Learning
Increase in projects	Scaffolding
Repetitive nature of assignments	Connections
Relevance of discussions and assignments	Self-regulated learning strategies
Detail in directions	Project-based learning
Alignment of objectives to assignments	Student and Instructor Readiness
Manageable assignment timeline	Student Engagement
More than just writing/writing conventions	Student Choice/Variety of Strategies
Relevant and current sources	Varied Instructional Strategies

Upon establishing this foundational "course redesign guide" and "wish list" of strategies and principles, we were ready to make key design decisions which would serve as parameters as we prepared for the next stage of development.

Design decision #1: Higher-order thinking. It has long been established in the educational community that higher-order thinking leads to greater and more meaningful cognitive experiences. For the online learning environment, the work of Robinson and Hullinger as well as that of Miller would suggest that an emphasis on higher- order learning activities may improve online student engagement and overall student success. In considering the revised Bloom's taxonomy for learning, teaching and assessing, higher-order activities would be those considered to be in the analysis, evaluative and creation categories (Anderson et al., 2001).

Therefore, our first design decision involved a commitment to design all student learning activities, to the extent possible, within these higher levels of education objectives.

Design decision #2: Discussion questions. The program traditionally presented two discussion questions each week. With the majority of these readings or videos, students would passively view or read and then react or relate to personal experience. Student feedback and research would suggest that a deeper dive with higher levels of critical thinking may lead to richer and more relevant learning. The questions we generated to guide us in the discussion design included:

How do we encourage students to participate or at least read all posts?
How can we incorporate student choice into our discussions?
How can we guide learning appropriately through our discussions?
How might we reference prior discussions and extend our learning into future weeks?
How can we connect discussion topics to other learning in the course?
How might we use student summaries of discussions to further learning?

Through our design phase, decisions were made to reduce weekly discussions from two to one each week, and to design these with multiple steps and student choice evident. Included in this decision was our determination to use weekly discussions to reference and build upon earlier discussions in the course and to guide our students in responding to multiple prompts and threads within one discussion. In addition, as part of our redesign process, all discussions would be aligned to a specific course objective and this alignment would be shared with the students. Variety would be evident as each weekly discussion would have a theme (debate, cause and effect, case scenario, etc.). The increased relevancy and rigor of this discussion question design decision would potentially lead to deeper online deliberation and learning.

Design decision #3: PLC collaboration. In recognizing research regarding the effectiveness of collaboration in the online learning environment in terms of increased social presence and higher student engagement, our third design decision was to include more opportunities for group collaboration in learning. In many schools across our nation, the Professional Learning Community (PLC) concept is one that is readily recognized as a successful approach to collaboration and continuous improvement. As stated in *Leaders of Learning,* Dufour and Marzano share that "no single person has all the knowledge, skills, and talent to lead a district, improve a school, or meet all the needs of every child in his or her classroom. We assert that it will take a collaborative effort and widely dispersed leadership to meet the challenges confronting our schools" (2011, p. 2). In applying the PLC approach to learning in our online environment, we made a design decision to include at least one PLC activity in each course, with these group activities spanning across multiple weeks of learning and utilizing higher levels of critical thinking. In addition, each of our PLC activities would include progress checks in order to allow instructors to closely monitor team dynamics and progress.

Design decision #4: Project- based learning. Another important design decision made during this phase of our redesign process was the commitment to project-based learning. Research indicates the need for practice, personalization, active engagement and higher order processes (Chickering & Gamson, 1987; Miller, 2014), and our own students' feedback indicated a desire for increased use of projects as part of student learning. This decision included a redesign intent to incorporate at least one significant, multi-week individual project-based

learning activity into each course, with the activity utilizing higher-order critical processes and a strong relevancy to course learning objectives.

Design decision #5 Self-regulated learning strategies (SRLS). Based on the research of Wander and Imbriale (2017), Barnard-Brak et al. (2010) and others, our next design decision involved self-regulated learning strategies and the inclusion of an introduction to these as part of our online program. How this may be done or presented could vary, but the important component of our commitment was to ensure that our students would be aware of the research on SRLS and aware of the potential for their own online success through the use of such.

Design decision #6: Speaking skills. The research of Robinson and Hullinger (2008) is quite compelling when considered in terms of course design. Conducted with over 200 online graduate students, the conclusions suggested that online students generally view the online learning format as one that allows for effective collaboration and higher-order analytical learning, but falls fall short in terms of development of speaking skills. This can be especially challenging in asynchronous online courses (ones in which teaching and learning is never "live"). Our final design decision was to include opportunities in our online courses for students to develop speaking skills as part of their online learning experience. With our design decisions made and our vision set, we were ready to proceed to the actual development of our redesigned courses.

ADDIE: Develop

The next stage in the ADDIE process is that of development – using the design principles and decisions and vision to actually drive assignment and course development. As described by the course designers of Northern Illinois University:

> Development (or production) is the step where you actually create the things used in teaching: the lecture material, the Web site that supports the course, the handouts and assessment rubrics that instructors and students will use, a PowerPoint presentation, or a video tape on case studies digitized for viewing online (2019, p. 2).

With the development of any component of an online course, three elements must be considered: the structure, the dialogue, and the autonomy of the course (Kanuka, 2011). The structure refers to the actual developed components, while the dialogue refers to the ability or likelihood that those components will allow for peer interaction. Autonomy refers to the degree to which students will choose to follow guidance or directions in order to achieve desired results. In keeping these developmental elements in mind, the course designer must also consider the evolution of online learning in terms of instructional strategies and developmental choices. As Kanuka shared in 2011 research:

> distance education has moved from a (mostly) one-way, paper-based content dissemination format whereby interaction was typically limited to student-content interaction to an interactive, collaborative, and community of learners, paradigm inspired, and made possible, through the use of net-based communication technologies—which most of us now refer to as online learning (p. 2).

Applying design principles to an online course through selection of the most effective balance of assignments and discussion (structure) with elements that allow for interaction and autonomy are critical steps in the developmental phase.

Our AD<u>DI</u>E Journey: The Development Phase

The development phase allowed us to apply all of the commitments and design principles, based on research and student feedback, which we had established in the first two phases of this redesign process. An early recognition that would be needed in this phase is the realization that not everything had to be recreated or revised. There were many elements included in our current courses which already met the design principles we had established. In instances where that was not the case, application of our design vision was followed explicitly. In applying these concepts, our redesign included the following in each course:

  a. Multi-step, higher-order activities
  b. Alignment of weekly, course, and program objectives, with these clearly shared with students prior to each assignment.
  c. One discussion question per week, with multi-step learning, student choices, prompts to require deep dives with a variety of peers, unique prompts for each week (debate, cause and effect, case scenario, etc.), and reference to prior week's discussions.
  d. Self-regulated learning strategy research introduction and weekly tips
  e. One individual, multi-week project-based learning activity per course, including higher order strategies and relevant products
  f. One collaborative, small group Professional Learning Community activity per course, including higher order strategies and relevant projects

It was also during the development stage that we engaged in a careful and methodical study of our learning objectives. To what degree were our weekly, course, and programmatic objectives aligning with one another – and with each assignment in which the students were engaged? In developing each course lesson or assignment, we deliberately identified (or revised as needed) the learning objective or programmatic goal with which it was aligned. This tight calibration would be useful as development continued and current course content was abandoned or revised and new course content was developed.

In addition, in progressing through the development of the redesigned courses, we remained focused on our priority of designing a highly engaging online experience. Rather than encouraging passive learning through our selection of strategies or activities, we aimed for a more active student population, and this was especially critical in our discussion forums and our collaborative activities. As shared by Romiszowski and Mason:

> Both engagement theory and collaborative learning theory would suggest that the use of discussion forums brings the students directly into contact with the content material of the course instead of leaving them on the outside as passive learners. Through this interaction, it is postulated, students are building their knowledge instead of relying on simple memorization skills. If these theoretical positions are valid, one could expect the use of discussion forums to be more effective than, for example, quizzes or objective testing as a means of promoting learning. (2004; p. 401).

The implication of this research to online instructors and course designers is to "recognize and support the nature of learner's online participation" (Kibritchi et al., 2017, p. 10). Through their research on graduate online programs, Niess and Gillow-Wiles exposed the complete dependency of the quality of the learning community on the involvement of each individual student. (2014). The research team also concluded that the less lonely and isolated students felt, the more motivated they were to get engaged in the course (Niess & Gillow-Wiles, 2014). This

desired learning community was directly related to the design and development of active discussions and collaborative tasks.

ADD<u>I</u>E: Implement

In transitioning into the implementation stage, the opportunity arises for people besides the course designers to now be involved in the course redesign process as the actual instructors of the course are now key players in its successful execution.

> Implementation is where the actual instruction takes place. Students rely on the expertise of their instructors to present the content in a meaningful way. At the same time, students should be engaged in the learning process. All of the planning done in the design and development stages is onstage in the implementation phase. This is where instructor's expertise shines, along with the selected approach to teaching…Implementation then, involves facilitation of learning (Northern Illinois University, 2019, p. 2).

Our ADD<u>I</u>E Journey: The Implementation Phase

Once the redesign was completed, the newly designed course was implemented with an incoming cohort of students. Before doing so, however, we once again engaged in a student workload analysis. Even though our newly designed course had fewer "things" for students to do, would this deeper dive with more higher-level strategies result in a more engaging course for students? Upon completing this time-on-task analysis, it was discovered that not only had we closed the 50-hour plus gap in workload hours, we were now several hours beyond the 135-hour recommendation from the Carnegie Foundation. Our deeper dives and our focus on analysis, evaluation, and creation had led to more rigorous course content as evidenced through our significant increase in workload hours.

ADD<u>I</u>E: Evaluate

Once the designing, developing and implementation stages are completed, the final step is to evaluate the extent to which the course is effectively meeting student learning needs and leading students to program success. There are many different ways in which course effectiveness may be evaluated. Student grades, real-time student feedback and course evaluations all offer important insight into what elements of the course are working well in facilitating student engagement and learning (George Mason University, 2019). Evaluation input may come from professional colleagues and administrators as well as from the students taking the course (Illinois State University, 2019). By whatever means chosen and utilized, it is critical that this evaluation occur both formatively (while the course is progressing) as well as in summation (once the course has concluded). Online course instructors must be prepared to continuously improve various elements of the course, based on data and feedback, and to compare the course vision with what is actually happening in the online classroom. This evaluation process includes "continual monitoring of the student engagement and progress, by peer and student review, and by careful consideration of conflicting feedback" (University of South Australia, 2019, p.1).

Our ADD<u>I</u>E Journey: The Evaluation Phase

Moving forward, the evaluative steps of our redesigned course will mirror those of our analysis during the first phase. We will continue to monitor student engagement through discussions and other collaborative opportunities, monitor student grades and completion of

learning objectives, plot and assess the student workload and time-on-task, request student feedback, both formative and summative, and discover the effectiveness of our course through student success in program goals.

Conclusion

While online teaching and learning has gained in popularity in recent years, with online enrollments and course offerings increasing each year, course design, strategy selection, student workload and learning relevance often lags behind in terms of evolution of effectiveness. In acknowledging the challenges that online learners and the online learning format may present, course designers have the opportunity to incorporate effective strategies and course structure aimed at higher student engagement and optimum student success. It is critical to continually assess current online courses for alignment to research on effective online practices. In analyzing one university's course redesign journey using the ADDIE educational process model, these very challenges were described and addressed. Further experiences with course redesign in the online environment may lead to additional recommendations and application of effective online teaching in the facilitation of student success in the online learning environment.

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