

Using the Backward Design Model and Formative Assessment to Develop and Refine Online Courses

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Abstract

Except for the need to create an online course in a Learning Management System (LMS) and using technology tools such as online forums, video conferencing, online assessments, group editing of documents, and other technological tools too numerous to mention, there are relatively few differences in planning and designing online courses and traditional face-to-face course creation. In fact, it is suggested that the design of online courses, follow the time-tested practices and strategies of traditional course design. The writer believes the backward design model (designing with the end in mind) developed by Wiggins and McTighe [1] is the most efficient and effective approach to course design. Wiggins and McTighe hold that the process of lesson and course design involves first examining and understanding the desired learning outcomes. The course designer next applies a series of questions to create an assessment designed to measure the extent that the learner has acquired the targeted knowledge and skills relating to the learning outcomes. Next, the learning objectives are designed in a manner that provides the learner with the requisite knowledge and skills which will allow him to demonstrate his level of mastery on the assessment. The course designer then uses the lesson objectives to drive the design and establishment of course content. Lastly, the course content forms the foundation on which learning activities and individual lessons are based and created. Also discussed is the role that formative assessment plays in informing instruction and thereby serves as a tool the instructor uses to further develop and refine the individual components of a course.

Keywords: backwards design, online course design, learning outcomes, learning objectives, assessment, design with the end in mind;

Introduction

In recent years there has been a steady increase in the numbers of students enrolled in at least one online course offered by public and private universities in the United States (see Table 1). This steady increase of student enrollment in online courses has created a need for designing and planning additional online course offerings. In addition, the increase of student enrollment in online courses has also made it necessary for instructors of traditional face-to-face courses to revise, redesign, and deliver their courses following an online course format. Professors whose task is to reformat their traditional face-to-face courses or create new courses are finding it necessary to refamiliarize themselves with the course design process and to review the concepts and factors which impact effective teaching and learning. Due to the continuously evolving learning standards, professors, whether they teach online or traditional courses, must remain current in their knowledge of national and state level learning standards associated with the subjects they teach. National accreditation boards and organizations review courses and assessments to assure their alignment with the established learning standards. Professors are required to keep this in mind as they go through the course creation and/or redesign process.

As program coordinator and professor in our institution's master's degree program in educational leadership, the author provides the following example which illustrates how national standards drive degree programs, their associated courses and assessments, and necessitate curricular and course revisions:

- ELCC (Educational Leadership Constituent Council) standard ELCC 1.2 states: **Candidates understand and can collect and use data to identify school goals, assess organizational effectiveness, and implement plans to achieve school goals.** This standard presents the expected outcomes.
- Using the stated outcomes, a course curriculum was created which focuses on the collection and analysis of school demographic, academic performance, school process, and perception data needed to create a school improvement plan. (our graduate students, who hold full-time teaching positions, are required to use the actual data from the schools in which they teach)

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- The course curriculum serves as the foundation upon which the design and development of a series of individual lessons and learning activities rest. The lessons and activities involve; (1) requiring the students to examine the sources and quality of data, (2) disaggregate the data types by gender, ethnicity, educational classification, language proficiency, and social economic status, (3) identify learning gaps within and across grade levels and disaggregated groups, (4) generate an actual report which could be used by the school's leadership team to create and implement an effective School Improvement Plan (SIP).
- Since the goal of this ELCC standard is to develop professional leadership knowledge and skills, the assessments for this course (Using Data to Affect Change) are performance based and the above-mentioned report serves as the assessment instrument.

Face-to-Face and Online Course Design

Except for the need to upload one's online course into an online Learning Management System (LMS) such as Moodle, Blackboard, or Brightspace along with their supplemental technology tools, there is very little difference between designing an online course and a face-to-face course that follows traditional delivery methods. All courses, whether delivered online or traditionally in face-to-face settings, have a great deal in common:

- As a result of accreditation requirements, the content and associated assessments of many higher education courses have to be aligned with specific learning standards which essentially list the knowledge and skill sets students are expected to acquire and demonstrate. Engineering, teacher preparation, and nursing programs, for example, are held accountable by accreditation agencies who review course content and their respective assessments to determine the extent that they are in alignment with national standards.
- Course content, follows a curriculum whose purpose is to allow students to develop and refine standards-based knowledge and skills.
- The curriculum serves as the foundation on which specific learning activities are planned, organized, and presented to students.
- The role of formative assessments (administered during the introduction and practice of targeted knowledge and skills) is to inform instruction by providing the instructor with information regarding the extent that students are acquiring and mastering the presented material. The instructor uses this information to refine and/or revise teaching methodologies.
- The role of summative assessments (administered at the conclusion of a course) is to inform the instructor regarding the extent that students have developed, refined, and acquired the targeted knowledge and skills. Summative assessment can also serve as part of a measure of teacher effectiveness by using summative scores as a measure of student growth.

Design with the End in Mind

The research of Wiggins and McTighe [1] presents an interesting approach to course and lesson design which, makes a great deal of sense. They suggest that one should design courses with the end in mind. As mentioned above, these learning standards or outcomes are the foundation upon which curricula, learning activities, and assessments are built and represent the end product (outcomes) of instruction. Essentially, they suggest that the course design process is a backwards stepping process which flows from the expected outcomes or ends, through course goals and objectives, next to the course curriculum, moves on to the creation of formative and summative assessments, and finally moves to the design of learning activities and individual lessons. The author suggests that the reader use the answers to the following questions as a guide during the course design process:

1. What are the learning standards which are associated with the course being designed?
2. Based on the learning standards i.e. learning outcomes, what are the students expected to know (knowledge) and be able to do (skills) by the time they complete this course? The answers will help the professor form course goals and objectives.
3. Targeting the course goals and objectives, what course context and content do I need to include in my course design so that my students are able to acquire the knowledge and skills related to the learning outcomes? The answers will help the instructor create the course curriculum and identify and develop necessary course materials.

4. Focusing on the curriculum and course materials, how will I determine the extent that my students have mastered and possess the requisite knowledge and skills mentioned in the learning/outcome standards? The answer to this question will guide the design of the format and content of the summative assessment for this course.
5. Once the professor has designed the summative assessment for this course, what does the professor have to teach the students in order for them to be successful on the summative assessment? The answer to this question will help in the design of appropriate learning activities and individual lessons.
6. While the students are engaged in the learning activities which are part of the individual lessons, how will the instructor determine the extent that lessons and learning activities are effective and are actually helping students to acquire and master targeted knowledge and skills? The answer to this question will assist the instructor in the creation of formative assessments. It is important to note here that formative assessments are valuable tools that can inform instruction by providing the instructor with information regarding whether concepts need to be reviewed or retaught, or whether to employ alternate instructional strategies, etc.

The Use of Online Student Forums and Assignments to Inform Instruction

Noted psychologist and theorist in the area of learning, Lev Vygotsky believed that learning is a social activity and that we learn from each other. One of the more common and successful online learning activities is the online discussion forum. Online forum discussions and their impact on teaching and learning provide strong evidence supporting Vygotsky's learning theory. Online discussion forums provide students with the opportunity to interact and share their thoughts and ideas with their colleagues while at the same time allow the professor to monitor and follow the discussions to determine the extent that students are able to synthesize and explain in their own words the concepts and topics of the online forum.

After reading assigned journal articles, textbook chapters, viewing videos, or reviewing presentations students post to the course discussion forum and submit to the professor a 500-word essay based on the online assignments. They are also required to read and reply to the postings of their student colleagues.

These activities provide the students and the professor with the following:

1. The professor, by reading the forum posts and grading the essays, is able to provide the students with constructive feedback on the quality of their essay. This informs the students regarding the extent of their mastery of the material—**INFORMING THE LEARNER**
2. The professor, by reading the forum posts and grading the essays, is able to determine the extent that the students have mastered the material. With this information, the professor may choose to reteach the material, progress to the next learning topic, and/or identify which student(s) may need extra help—**INFORMING INSTRUCTION**
3. By reading their colleagues posts and replying in writing to them, the students experience social learning as theorized by Vygotsky—**INFORMING THE LEARNER**
4. Students use and apply the professor's feedback and the comments of their fellow students as they prepare future posts—**INFORMING THE LEARNER**

Conclusion

Whether designing courses for online delivery or courses for traditional face-to-face delivery, there is little difference in the design process. The research of Wiggins and McTighe holds that the backwards by design process is an efficient method which can result in the creation of courses, curricula, learning activities, individual lessons, and both formative and summative assessments that are all aligned with national and state level learning standards. The backwards by design process starts with the end in mind, i.e. learning outcomes listed by the learning standards and progresses backwards toward the development of specific learning activities and individual lessons. It was also noted that both formative and summative assessments inform instruction as well as the learner.



	2012	2013	2014	2015	2016
All Students:	20,511,849	20,454,336	20,637,987	20,536,231	20,464,608
Students Not Enrolled in Any Distance Courses:	15,425,940	15,157,495	14,885,489	14,547,400	14,124,317
Students Enrolled in at Least One Distance Course:	5,085,909	5,296,841	5,752,498	5,988,831	6,340,291
Proportion of All Students Who Are Enrolled in at Least One Distance Course:	24.8%	25.9%	27.9%	29.2%	31%
Students Enrolled Exclusively in Distance Courses:	2,310,056	2,427,504	2,804,867	2,873,144	2,983,075
Students Enrolled in Some (but Not All) Distance Courses:	2,775,853	2,869,337	2,947,631	3,115,687	3,357,216

Table 1 Student enrolment in at least one online course at US public and private universities [2]

References

- [1] Wiggins, G, McTighe, J. "Understanding by Design", Expanded 2nd Edition, Alexandria, Virginia, ASCD, 2005, 370 pages
- [2] <https://www.insidehighered.com/digital-learning/article/2018/01/05/new-us-data-show-continued-growth-college-students-studying?width=775&height=500&iframe=true>