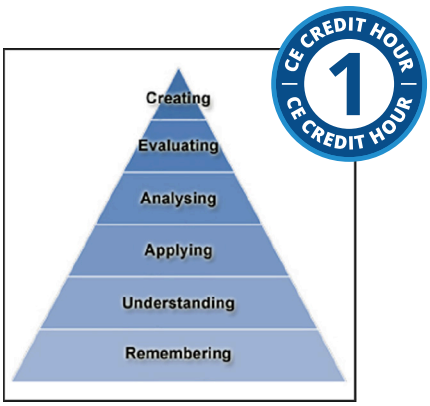
Strategies for Developing a Quality Course: Teaching Methodologies/ Faculty Development



Course Author(s): Cynthia C. Gadbury-Amyot, MSDH, EdD, FADHA
CE Credits: 1 hours
Intended Audience: Dentists, Dental Hygienists, Dental Assistants, Dental Educators, Dental Hygiene Educators, Dental Assistant Educators
Date Course Online: 11/20/2012
Last Revision Date: 04/12/2026
Course Expiration Date: 04/11/2026
Cost: Free
Method: Self-instructional
AGD Subject Code(s): 149

Online Course: *www.dentalcare.com/en-us/ce-courses/ce398*

Conflict of Interest Disclosure Statement

- The author reports no conflicts of interest associated with this course. She has no relevant financial relationships to disclose.

Introduction – Developing a Quality Course

This free continuing education course provides information on the latest strategies for course design with a focus on integration with curriculum and program competencies.

Course Contents

Overview

This course will introduce participants to the latest strategies for course design, with a focus on integration with curriculum and program competencies. Participants will explore instructional design principles that foster a learner-centered teaching and learning environment. A 360-degree approach to course design will be examined, showing the linkages between learning goals, teaching and learning activities, assessment, feedback and subsequent revision for continuous course improvement.

Learning Objectives

Upon completion of this course, the dental professional should be able to:

- Implement course design strategies that ensure an integrated relationship between the course, program competencies and curriculum.
- Develop a course syllabus that delineates a clear alignment between course objectives, teaching and learning strategies, assessment measures and outcomes.
- Use the backward design approach to course development where outcomes are determined first and the course is designed by progressing backward from assessment strategies aimed at assessing actual skills needed to achieve course outcomes, to development of course assignments and teaching strategies centered on skill building.
- Write learner-centered, performance-based objectives that support active learning and critical thinking and problem solving.
- Become conversant in accreditation standards and guidelines in order to be able to articulate the relationship between your course and accreditation requirements.
- Develop the kind of course that provides students with the skills and knowledge that leave a lasting impression as they work toward their educational goals.

Integrated Course Design

Curriculum Mapping and Program Competencies

It is imperative when designing a course that the faculty member is aware of how the course fits into the curriculum as a whole. The curriculum is composed of a series of courses that create a learning sequence for the student. A well planned and well thought out curriculum will ultimately result in a good learning experience for the student where the relationship between courses and learning activities make logical sense and build upon one another along the learning continuum. The faculty members who are aware of these relationships will be an invaluable asset to students and their higher learning institutions. See Table 1 for an example of a curriculum document: *Curriculum Mapping to Assist in Guiding Course Design*. The mapping of curriculum provides a visual representation and assists the faculty member in seeing how their course contributes to the overall curriculum and what program competencies are tied to their course.[1-2]

Dental education in the United States participates in professional accreditation through the Commission on Dental Accreditation (CODA – accessed at https://coda.ada.org/). In 1998 CODA adopted standards for a competency-based curriculum for dentistry and dental hygiene followed in 2000. Competency is most often used to describe the knowledge, skills, and professional values of an individual ready to begin independently practicing.[3-4] Competency-based education assumes that the student progresses through stages in the learning process starting with the novice or beginner stage and ultimately reaching competency prior to graduation. Both the dental and dental hygiene accreditation

standards include the provision that competencies be developed for all aspects of the program as well as outcomes assessment to track attainment of competencies. Outcomes assessment focuses on student learning outcomes including personal changes or benefits that follow as a result of learning. For dental education these outcomes are measured in terms of competencies.

Just as faculty need to have a good understanding of the curriculum, likewise they must be aware and understand program competencies in order to determine which specific program competencies are supported by their course. Then, as required by CODA, the faculty member must develop outcomes assessment measures to track attainment of competency. The curriculum map points out which courses are intended to serve as foundational, which courses introduce which competencies, which courses further develop and assess competency, and finally, where comprehensive assessment is achieved in the curriculum. With this understanding, the faculty member is able to develop a course that contains building blocks for students to gain the knowledge, skills and values necessary to ultimately achieve competency.[1-2]

Table 2 is an example of a competency document demonstrating the relationship of course content to defined programmatic competencies. Table 3 represents a document demonstrating the relationship between courses AND outcomes assessment. Examination of Tables 2 and 3 can help faculty and administration identify gaps in the curriculum, and identify where there is repetition within scope and sequence of courses.

Backward Design

A strategy that has been helpful in assisting faculty with course design is known as Backward Design. Backward Design originated with Wiggins and McTighe in their book Understanding by Design.5 This differs from the age-old beginning-to-end approach to instructional design where the instructor first would decide what content to teach before developing activities and assessment for the resulting learning. This concept is outlined in a book by Dee Fink titled: Creating

Table 1. Curriculum Mapping to Assist in Guiding Course Design.

Program Competencies	BIO501	D5423	D6589	D7994	OSCE
Program Competency 1	A	B	C		D
Program Competency 2		A		D	
Etc.					

Key:
A: Foundational
B: Introduced
C: Further developed and assessed
D: Comprehensive assessment

Table 2. Competency Mapping (Demonstrating the relationship of course content to defined programmatic competencies).

Course		Program Competency 1	Program Competency 2	Program Competency 3	Etc.
Fall – Year 1					
*F	DH3065: Head & Neck Anatomy	X		X	
	DH3200: Dental Morph & Occlusion	X	X	X	
	DH3020: Dental Radiology				
	Etc.				
Spring - Year 1					
F	DH3210: Biochem & Nutrition				
	DH3225: Histology and Pathology	X	X	X	
	DH3260: Principles of Perio 1	X		X	
	Etc.				
F: Foundational					

significant learning experiences: an integrated approach to designing college courses, where he describes a framework for educators for designing courses that foster deep learning and student engagement through a learning-centered approach.6 In his book, Fink's framework starts with use of "Backward Design" where the faculty member starts out thinking about what they would like to see as the end result of a student taking their course (Figure 1). Fink suggests that faculty first ask themselves, "What do I hope the students will have learned that will remain with them throughout their educational experience and beyond?" From there, faculty work backwards to build a course that will help students gain the knowledge, skills and values necessary to achieve the final result (outcomes). In building one's course with the intent of creating significant learning experiences, it is instructive to remember the paradigm of student-centered learning, where the focus is on what students need to learn and do, rather than on what faculty need to teach. Backward Design helps instructors plan or revise courses by integrating learning goals with active and reflective classroom practices. Research shows students learn best when prior knowledge is engaged, conceptual understanding is built through active learning, and metacognition is encouraged.7 It is no longer acceptable for a faculty member to stand at the front of the

Table 3. Curriculum Mapping (demonstrating the relationship between courses and outcomes assessment /outcome measures).

Program Competency 1: Manage medical emergencies and complications that may occur during dental treatment			
Year One	**Year Two**	**Year Three**	**Year Four**
Basic Life Support for Health Professionals *Outcome measure:* Certification	**Anesthesiology (D6414)** *Outcome measure:* Successful completion of course requirements	**Basic Life Support for Health Professionals** *Outcome measure:* Recertification	**Anxiety & Pain Control (D6613)** *Outcome measure:* Successful completion of course requirements
Intro to Oral Diagnosis (D6310) *Outcome measure:* Successful completion of course requirements	**Pharmacology (D6513)** *Outcome measure:* Successful completion of course requirements	**Therapeutics (D6528)** *Outcome measure:* Successful completion of course requirements	
		Comprehensive Patient Care sequence I, II (D6520C, D6521C) *Outcome measure:* Clinic Semester Evaluation using Team Evaluation Form	**Comprehensive Patient Care sequence III, IV, V (D6590C, D6695C, D6698C)** *Outcome measure:* Clinic Semester Evaluation using Team Evaluation Form; Oxygen Administration Competency; Code Blue Competency; OSCE
	Medical Emergencies (D6440) *Outcome measure:* Successful completion of course requirements	**Oral Surgery Clinical (D6551C)** *Outcome measure:* Oral Surgery Competency Exam; Medical Emergencies Exam	
	Principles of Medical and Physical Diagnosis (D6525) *Outcome measure:* Successful completion of course requirements	**Oral Diagnosis Clinical (D6635C)** *Outcome measure:* Oral Diagnosis Basic Skills Exam	**Oral Diagnosis Clinical (D6635C)** *Outcome measure:* Oral Diagnosis Competency Exam

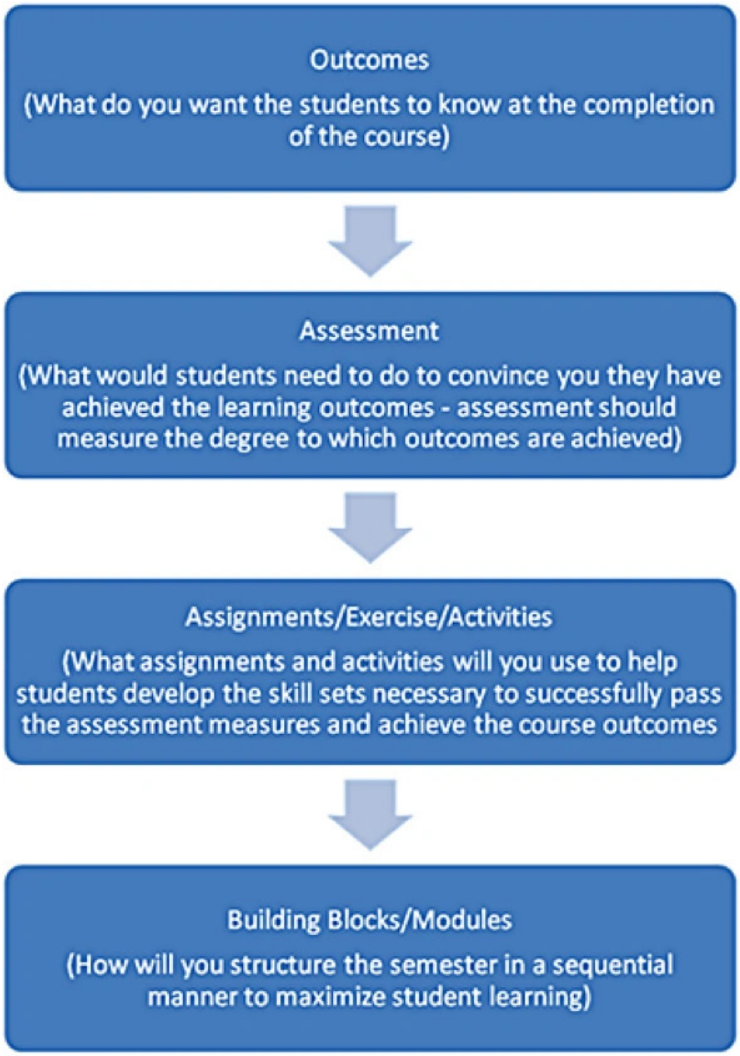


Figure 1. Backward Course Design.[6]

room and lecture for the course allotted time with little to no interaction from the students. A quick review of learning theory will help to further support this point.

Learning Theory

Constructivism is a theory used to explain how people know what they know. Constructivism theorists extended work conducted by John Dewey, an American philosopher and educator.[8] Dewey believed education depended on action-knowledge and ideas emerge only in situations where learners are required to draw upon their own experiences that have meaning and importance to them. The basic tenet is problem solving is at the heart of learning, thinking and development. The work of developmental psychologist and constructivist theorists such as Jean Piaget and Lev Vygotsky have long emphasized the need for pre-existing knowledge with which to construct one's own understanding and meaning of new knowledge (constructivism) and the influence of social interactions on the learning process (social constructivism).[9-10] A form of social constructivism is the social interaction that takes place during discussion. It is believed that participation in discussion increases a student's ability to test their ideas, synthesize the ideas of others and build deeper understanding. As people solve problems and discover the consequences of their actions –

through reflecting on both past and current experiences – they are able to construct their own understanding. Learning, therefore, is an active process that requires the learner to engage in the learning process. David Ausubel, a cognitive psychologist, further added to the literature in constructivism with his Assimilation Theory of Meaningful Learning.[11] Ausubel compared meaningful learning to rote learning, referring to when a student simply memorizes information without relating that information to previously learned knowledge. The result of rote learning is new information is easily forgotten and not readily applied to problem-solving situations because it was not connected with concepts already learned. In meaningful learning the learner is able to recognize links between concepts by relating new knowledge to relevant concepts they already know meaningful learning requires more effort – the student must engage for meaningful learning to occur. But, the result of meaningful learning is that this knowledge is then transferred to long-term memory.

So, with the previous theory as background, let's return to Fink's Backward Design (Figure1), where we started out by thinking about end points – what is it we want the students to take away from our course (**outcomes**).[6] The answer to this question forms the basis of the learning goals. The second step is to ask the question, what would the students have to do to convince me they have achieved those learning goals (**assessment**)? In a competency-based educational program, the course designer also has to keep in mind which program competency(ies) does their particular course contribute to (Table 1). How is your course contributing to students gaining the knowledge, skills and values in order to attain this competency or competencies prior to graduation? Remember the CODA standards include the provision that there must be outcomes assessment for tracking attainment of program competencies (Table 2 – outcomes assessment/measures). By answering these questions, it helps to guide assessment activities. The third step is to ask, what would the students need to do during the course to be able to do well on the course assessment activities (**assignments, exercises, activities**)? By answering this question, the faculty member is able to develop appropriate building blocks and course material needed to give the student the tools for success in the course. Remember the paradigm of student-centered learning, where the focus is on what students need to learn and do, rather than on what faculty need to teach. Think about what assignments and activities you will use to help students develop the skill sets necessary to successfully pass the assessment measures and achieve the course outcomes (goals). Finally, how will you structure

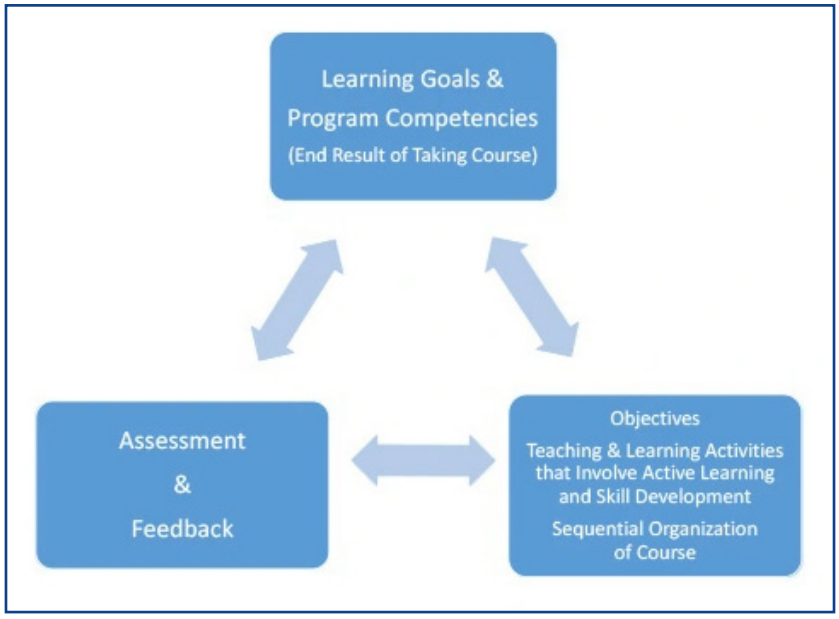


Figure 2. Integrated Course Design.

the course in a sequential manner to maximize student learning (**building blocks/modules**)? Ultimately, everything planned for the course should relate back to the course goals (Figure 2) and the program competences. If the assignments, projects, quizzes and tests fail in helping the student to gain the knowledge, skills and values necessary to achieve the course goals, then the course has not done what it set out to do. An example might help to illustrate this. If the goal of a course is to have students analyze and synthesize information but the only assessment strategy used in the course includes a multiple-choice midterm and final examination. As a result, the student is not likely to achieve the goal of analyzing and synthesizing information. An assignment might involve placing students in peer groups, providing them with a research article and asking them to work through the steps of critical thinking that involve analysis and synthesis. These types of skill building exercises in analyzing and synthesizing information with faculty feedback along the way are more likely to achieve the course goal (outcome) of analysis and synthesis of information.

Writing Course Objectives

With broad course goals (Figure 1 - outcomes) as a starting point, the next step is the development of objectives that are performance based and measurable. Objectives should focus on what the student needs to do and know, not on what content will be covered. Again, the student-centered approach to teaching is evident in this approach to course design. A major obstacle has been stating student learning outcomes in performance terms. This has been a difficult transition in education since many educators have been accustomed to defining their teaching in terms of content area versus student learning outcomes. Objectives (learning outcomes) need to be stated in terms of performance so that in the end the faculty, student, and other interested parties can determine whether the outcomes has been met, or not. Objectives must be measurable and they do not need to be low-level cognitive outcomes.

So, let's turn to Heinich and colleagues' ABCD Learning Objective Model, used for writing objectives (https://support.dsu.edu/TDC lient/1796/Portal/KB/ArticleDet?ID =148325#:~:t ext=The%20ABCD%20Model%20of%20Objectives,ne eds %20 an d%20environments%20of%20students.) . This model outlines four elements that help to ensure that instruction has both a clear objective and a clearly defined desired outcome.
The four elements are as follows:

Audience

Behavior

Conditions

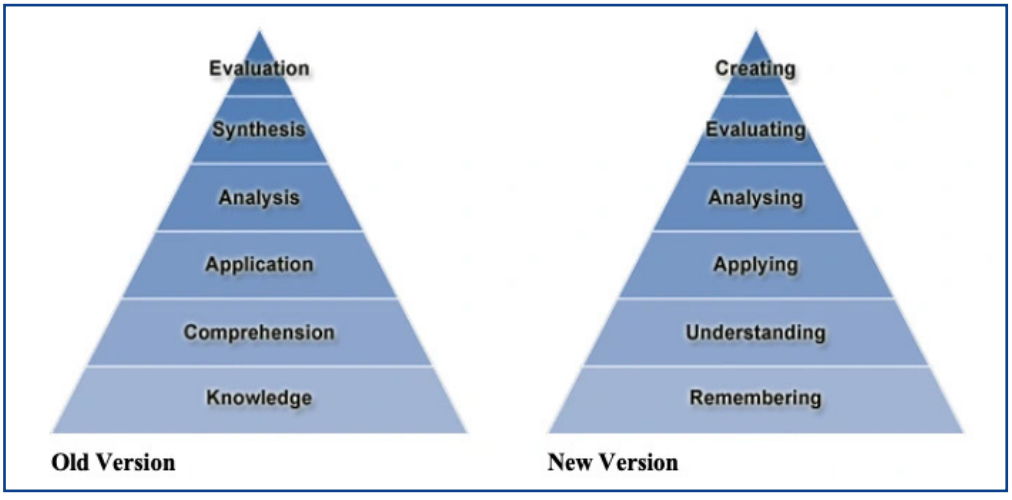


Figure 3. Bloom's Taxonomy of Learning.

Table 4. Action Verbs for Writing Objectives.

The Cognitive Processes Dimension					
Lower order thinking skills ↔ Higher order thinking skills					
Remember	Understand	Apply	Analyze	Evaluate	Create
Recognizing • identifying **Recalling** • retrieving • list	**Interpreting** • clarifying • paraphrasing • representing • translating **Exemplifying** • illustrating • instantiating **Classifying** • categorizing • subsuming **Summarizing** • abstracting • generalizing **Inferring** • concluding • extrapolating • interpolating • predicting **Comparing** • contrasting • mapping • matching **Explaining** • constructing models	**Executing** • carrying out **Implementing** • using	**Differentiating** • discriminating • distinguishing • focusing • selecting **Organizing** • finding coherence • integrating • outlining • parsing • structuring **Attributing** • deconstructing	**Checking** • coordinating • detecting • monitoring • testing **Critiquing** • judging • assessing	**Generating** • hypothesizing **Planning** • designing **Producing** • constructing

Degree

Let's look at each of these elements individually.
Dental Education Association and U.S. Department of Health and Human Services provide an acceptable performance level.

Audience – The audience describes who the learner is.

Behavior – The behavior is the action, skill, competency, or learning that the audience (the learner) will accomplish as a result of your teaching/activity. (We will review Bloom's Taxonomy below for examples of power verbs).

Condition – The condition describes the

circumstances under which the learning will occur. In other words, it describes required resources or materials the student would need to access when completing the task.

Degree – The degree describes the level of mastery the student must demonstrate to indicate he/she successfully mastered the objective.

Next, let's look at an example of how to put the ABCD model into action! Table 4: ABCD Learning Objectives Model Exercise
Next, we will explore Bloom's Taxonomy, a hierarchical framework that helps educators organize and structure learning objectives based on their level of complexity and specificity. An excellent overview of the history of this longstanding taxonomy can be found in a piece written by Mary Forehand.12 In Forehand's overview, Bloom's Taxonomy is defined as a multi-tiered model for classifying thinking according to six cognitive levels of complexity (remembering, understanding, applying, analyzing, evaluating, creating).
In this taxonomy, Bloom attempts to organize learning into levels according to the sophistication of mental effort necessary to meet a given goal. During the 1990s, a group of cognitive psychologists, curriculum theorists, instructional researchers and testing and assessment specialists convened to discuss the revision of Bloom's original taxonomy. The result of their efforts was published in 2001 and remains pertinent today.13 Figure 3 illustrates the original and revised taxonomies. The most obvious difference between the old versus the new version is that the six major categories were changed from nouns to verbs. The reasoning behind this change was to be able to write objectives where the verb illustrates an observable action by the learner. For example, Knowledge was changed to Remembering, Application was changed to Applying. Comprehension and synthesis in the old version were renamed to understanding and evaluating, respectively. Finally, where originally the evaluation category was at the top of the pyramid, the new version has placed creating at the top. A list of action verbs can be found in Table 4. While it is not within the scope of this learning module to fully describe the process of revision of Bloom's Taxonomy, there are many excellent resources on the internet to assist the reader in more fully understanding this revision and subsequent development.

Learner-centered Instruction

As educators, we all think of ourselves as "learner-centered," so why has this become a buzz word in academic circles? The decade of the 90s will most assuredly go down as the beginning of an era of assessment and accountability for higher education. With mounting pressure on higher education institutions to develop students that have the skills and competencies needed to function successfully in the workplace, stakeholders from governors to state legislators to parents demanded a better understanding of what exactly is "learned" in college. A shift from content-centered teaching to learner-centered teaching is best described in the work done by Barr and Tagg (Table 5).[12] They propose that content-centered faculty deliver content to students – it is the "sage on stage" delivery where if I, as the content expert, tell you all that I know about a content area – the assumption is the student will come to know it as a result of listening to the faculty member. In contrast, learner-centered faculty embrace the concept of active learning which is supported through the learning theory outlined above. The learner-centered faculty member believes that only when students engage actively in the content, will they be able to learn and retain the information that then can be taken beyond the classroom and out into the workplace.

A more concrete example comparing "content-centered" vs. "learner-centered" follows. In a content-centered ethics course the mission and purpose would be for the faculty member to transfer knowledge from faculty to student through faculty developed lectures on the topic of ethics. Conversely, in a learner-centered ethics course, the mission and purpose would be to elicit the student's discovery and construction of their own knowledge on the topic of ethics. Rather than the traditional 50-minute lectures in the content-centered classroom, the learner-centered class would

involve experiential learning with students engaged in academic service learning and "hands on-real world" experience where they are required to grapple with ethical issues relevant to dentistry such as lack of access to oral health care services. The reader is encouraged to examine an article by Gadbury-Amyot, et al., which describes how an ethics course made the transition from the "Instruction Paradigm" to "Learning Paradigm," as described by the work of Barr and Tagg.[13] In the "Learning Paradigm," the learner-centered faculty member becomes a facilitator of learning versus the content-centered faculty who values being the "expert" on the topic with little to no idea of how students are interpreting the content.

Learner-centered faculty believe the students can learn only when they engage in the learning process and only through students grappling with ideas and concepts will meaningful and long-term learning take place. The learner-centered faculty member expects students to take responsibility for their own

Table 5. Content-centered Instruction vs. Learner-centered Instruction.[3]

The Instruction Paradigm (Content-centered)	The Learning Paradigm (Learner-centered)
Mission and Purposes	**Mission and Purposes**
Provide/deliver instruction	Produce learning
Transfer knowledge from faculty to students	Elicit students' discovery and construction of knowledge
Offer courses and programs	Create powerful learning environments
Improve the quality of instruction	Improve the quality of learning
Achieve access for diverse students	Achieve success for diverse students
Criteria for Success	**Criteria for Success**
Inputs, resources	Learning & student-success outcomes
Quality of entering students	Quality of exiting students
Curriculum development, expansion	Learning technologies development, expansion
Quantity and quality of resources	Quantity and quality of outcomes
Enrollment, revenue growth	Aggregate learning growth, efficiency

Table 5. Continued.

The Instruction Paradigm (Content-centered)	The Learning Paradigm (Learner-centered)
Quality of faculty, instruction	Quality of students, learning
Teaching/Learning Structures	**Teaching/Learning Structures**
Atomistic; parts prior to whole	Holistic; whole prior to parts
Time held constant, learning varies	Learning held constant, time varies
50-minute lecture, 3-unit course	Learning environments
Classes start/end at same time	Environment ready when student is
One teacher, one classroom	Whatever learning experience works
One teacher, one classroom	Whatever learning experience works
Independent disciplines, departments	Cross discipline/department collaboration
Covering material	Specified learning results
End-of-course assessment	Pre-/during/post-assessments
Grading within classes by instructors	External evaluations of learning
Private assessment	Public assessment
Degree equals accumulated credit hours	Degree equals demonstrated knowledge and skills
Learning Theory	**Learning Theory**
Knowledge exists "out there"	Knowledge exists in each person's mind and is shaped by individual experience

Table 5. Continued.

The Instruction Paradigm (Content-centered)	The Learning Paradigm (Learner-centered)
Knowledge comes in "chunks" and "bits"; delivered by instructors and gotten by students	Knowledge is constructed, created, and "gotten"
Learning is cumulative and linear	Learning is a nesting and interacting of frameworks
Fits the storehouse of knowledge metaphor	Fits learning how to ride a bicycle metaphor
Learning is teacher centered and controlled	Learning is student centered & controlled
"Live" teacher, "live" students required	"Active" learner required, but not "live" teacher
The classroom and learning are competitive and individualistic	Learning environments and learning are cooperative, collaborative and supportive
Talent and ability are rare	Talent and ability are abundant
Productivity/Funding	**Productivity/Funding**
Definition of productivity: cost per hour of instruction per student	Definition of productivity: cost per unit of learning per student
Funding for hours of instruction	Funding for learning outcomes
Nature of Roles	**Nature of Roles**
Faculty are primarily lecturers	Faculty are primarily designers of learning methods and environments
Faculty and students act independently and in isolation	Faculty and students work in teams with each other and other staff
Teachers classify and sort students	Teachers develop every student's competencies and talents
Staff serve/support faculty and the process of instruction	All staff are educators who produce student learning and success
Any expert can teach	Empowering learning is challenging and complex
Line governance; independent actors	Shared governance; teamwork

learning by becoming self-directed learners, ultimately improving their critical thinking and problem solving skills. Most academic programs have responded to increased demands for accountability by ensuring their curriculum has been thoughtfully conceived with logical and rational sequencing to maximize the learning experience for the student. Again, looking to learning theory to inform curriculum, the learner is taken through a sequence that includes the introduction of foundation knowledge and concepts followed by the introduction of more complex concepts and learning that can be built upon a solid foundation of knowledge. Well-designed assessment plans that include capstone projects such as portfolios are able to document the journey of student growth from novice to competent graduate and require the **students** to engage in reflection and self-assessment.

The hallmark of a competent individual has been defined as one's ability to accurately self-assess.[3] Portfolios used for assessment are purposeful collections of evidence accumulated over time and from multiple sources with the intention of documenting the learning process by involving students in active reflection on their learning. Capstone projects, such as portfolios, provide the venue where students engage in self-assessment and meaning making about their educational experience. While faculty ultimately deem students competent and ready for graduation, capstone projects, such as portfolios, provide the opportunity for students to demonstrate their competency through the evidence collected throughout the educational journey, and reflecting and assessing their growth, from beginning professional students to competent graduates.

Assessment Strategies: Formative and Summative

Classroom assessment can include a wide range of options from minute papers, where students write down the important "take home" messages of the lesson, to administering comprehensive final exams. A good way to think of assessment is to consider formative assessment and summative assessment. Shute defines formative feedback (assessment) as the information communicated to the learner that is intended to modify his/her thinking or behavior for the purpose of improving learning.[16] Formative feedback is intended to increase student knowledge, skills and understanding in some content area or general skill. Formative assessment is as important to the learning process as summative assessment (e.g., a test) – one could argue it is even more important since formative assessment allows students to scaffold learning as they work toward more advanced activities and to engage in more advanced thinking and problem solving than they could without such help. Additionally, formative assessment provides the opportunity for students to improve on an assignment/project prior to receiving a final (summative) assessment. Research on formative assessment has consistently shown good feedback can significantly improve learning processes and outcomes. Cognitive mechanisms for which formative feedback may be used by a learner include: (1) it can signal a gap between a current level of performance and some desired level of performance or goal, (2) it can effectively reduce the cognitive load of a learner, especially novice or struggling students and (3) it can provide information that may be useful for correcting inappropriate task strategies, procedural errors, or misconceptions. An excellent review of the literature on formative assessment can be found in Shute's article, *Focus on Formative Feedback*.[15]

Summative assessment is assessment that looks at a result rather than the process of getting to the result. Examples of summative assessment would be final examinations, or in a clinical setting in dental education, it would be competency testing.

Svinicki and McKeachie outlines nine assertions about assessing student learning that can provide guidance when considering assessment strategies when designing a course.[17] They are as follows:

- What students learn depends as much on your tests and methods of assessment as on your teaching, because what is measured is often what ends up being valued (take home message: be sure your measures

Table 6. Table of Specifications: Example for a Pharmacology Exam.

	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating	TOTAL
Drug category		(Q #7)					1
Interactions, adverse reactions, contraindications		(Q #2)		(Q #10)			2
Dental implications	(Q #3)		(Q #8)		(Q #4)		3
OTC/pain medications					(Q #9)		1
Med consult or prophylactic antibiotic						(Q #1)	1
Potential emergency situations	(Q #5)			(Q #6)			2
TOTAL	2	2	1	2	2	1	10

reflect what you want the students to learn).

- Don't think of tests simply as a means for assigning grades – rather tests should facilitate learning for both the faculty member as well as the students.
- Use some non-graded tests and assessments that provide feedback to students and you on where students are at on the continuum of learning.
- Check your assessment methods against your course goals – there should be a direct correlation.
- Some goals (values, motivation, attitudes, some skills) may not be measurable by conventional tests. Look for other evidence of their development. For example, if you are trying to capture ethical behavior, then a service-learning project with subsequent reflection would serve better than a multiple-choice test on ethical principles.
- Assessment is NOT synonymous with testing. You can assess students' learning with classroom and out-of-class activities (see example of ethics above).
- After the course is over, students will not be able to depend on you to assess the quality of their learning; therefore, practice in self-assessment is critical. It has been shown developing accurate student self-assessment requires training and practice. Peer assessment helps develop assessment skills and improves performance.
- Don't rely on one or two tests to determine grades. Varied assessments will give you better evidence to determine an appropriate grade.
- Finally, assessment is not simply an end-of-course exercise to determine student grades. Assessment can be learning experiences for students. Assessment throughout a course communicates your goals to students so they can learn more effectively; it will identify misunderstandings that will help you teach better; it will help you pace the development of the course; and it will help you do a better job of assigning grades.

Research has shown teacher-made tests typically measure lower-level learning, e.g., factual and recall. Even while faculty want to

see students develop higher-order cognitive skills, the tests that are used rarely measure these competencies. One strategy for good test construction is to develop a Table of Specifications where you list Bloom's cognitive taxonomy levels along the top of the page and content areas along the side of the page. By developing this table it will become clear whether your test items are truly measuring learning at the level you are trying to achieve in your course (Table 6).

Other methods of assessment can include such things as authentic and performance assessment. One example of performance

assessment is portfolio assessment where evidence and subsequent student reflection provide insight into student learning and achievement. The value of reflection to the learning process has been emphasized by learning theory. Team projects provide another venue for assessment strategies that go beyond quizzes and tests.

Let's Talk AI – Have We Lost Our Minds!

This module would not be complete without a discussion around artificial intelligence (AI). Since the release of Chatgpt in November of 2022, faculty have been grappling with how to adjust their teaching and learning to account for the impact of AI. Just as we educate students about the ethical use of this technology, we as faculty also must ensure that we are following the same principles. Just as we educate students to be critical thinkers and problem solvers, so too do we possess the human brain and engage it daily in our teaching and learning. We attend continuing education courses such as this course to further learn, in this case, the various aspects that factor into developing a quality course. In other words, we come to AI already possessing a wealth of education and experience. And no, we have NOT lost our minds.

The use of AI can be thought of in two ways. One is that we engage in the use of AI to serve as an "assistant". For example, as we develop teaching materials, we may ask AI to review our materials for readability, or to review our work to ensure it matches our objectives. In this example it would be using AI for writing style, and ensuring the content can be traced back to the objectives. We would not be asking AI to create content. The second way to think about the use of AI is to ask AI to create materials. This use will require that AI is cited and credited for that work. There are many excellent resources available that cover a variety of aspects of the use of AI. Some resources can be found below in the Internet Resources section of this learning module.

It is important to also touch base on the issue of the validity and reliability of content that is being generated by AI. It is worth noting that the Merriam-Webster's Collegiate Dictionary crowned "slop" as their 2025 Word of the Year!18 There is a reason for this and the dictionary definition of, "digital content of low quality that is produced usually in quantity by means of artificial intelligence" says it all. We owe it to our students to ensure that during their time with us, we are providing them with the tools and experiences to question content generated by AI. In all of dental education, one of the greatest things we ever did was incorporate evidence-based decision making into the curriculum. This important skill requires students to come up with a PICO question to guide their search of research databases. They are taught the skills of assessing the validity and reliability of the research, and finally basing decisions on good science. There are many excellent exercises and assignments that can enhance students' abilities for determining the quality of information found in AI material.

As faculty, it is imperative that we remain current and knowledgeable about AI. Just as you have taken this course regarding Strategies for Developing a Quality Course, I am sure we all are seeking out the many opportunities available for learning more about AI. Cautionary measures are extremely important when one considers the use of AI. If open AI is being used, there are no protections available for the data entered. Once we enter data in open AI, it is open to the entire world.

It is not the intent of this module to comprehensively cover AI, but hopefully the above provides incentive to become better

informed. As with all technology, there are the good, the bad, and the ugly sides. Be aware, be informed.

Conclusion

In conclusion, good course design involves a great deal of forethought and consideration. Framed within the current context of competency-based dental education and the call for change in the ways that we teach and assess competency, the author's hope is that readers will find the strategies outlined in this learning module helpful in implementing course design.

Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: *www.dentalcare.com/en-us/ce-courses/ce398/test*

1. Curriculum mapping is important for _____.

1. understanding how assessment, curriculum and instruction align
2. understanding which courses in the curriculum serve as foundation courses
3. understanding which courses develop skills directly related to specific program competencies
4. understanding which courses conduct competency testing

A. 1 and 4
B. 1, 2 and 4
C. 1, 3 and 4
D. All of the above.

2. Curriculum mapping can _____.

1. help identify gaps in the curriculum
2. result in an ill-defined curriculum
3. identify where there is repetition within scope and sequence of courses
4. result in a good learning experience for students

A. 1, 2 and 4
B. 2, 3 and 4
C. 1, 3 and 4
D. 4 only

3. Dental accreditation is accomplished through the _____.

A. American Dental Education Association (ADEA)
B. The Commission on Dental Accreditation (CODA)
C. Association of American Medical Colleges (AAMC)
D. Joint Commission on National Dental Examinations (JCNDE)

4. Order the following elements of course design, known as Backward Design, in sequential order:

1. Assignments/Exercises/Activities
2. Outcomes
3. Assessment
4. Building Blocks/Modules

A. 2, 3, 1, 4
B. 4, 1, 2, 3
C. 3, 1, 4, 2
D. 1, 3, 4, 1

5. Constructivism is a learning theory that focuses on _____.

A. objectively observable aspects of learning
B. the need for pre-existing knowledge with which to construct one's own understanding and meaning of new knowledge
C. learning as it takes place within a social context and is facilitated through modeling and observational learning
D. the concept that learning is a personal act to fulfill one's potential

6. Integrated course design involves the assimilation of the following elements:

A. Learning goals, and teaching and learning activities.
B. Learning goals, objectives, and teaching and learning activities.
C. Learning goals, objectives, teaching and learning activities, sequential organization of course, and assessment.
D. Learning goals, objectives, teaching and learning activities, sequential organization of course, assessment and feedback.

7. Which of the following options lists the elements of the revised Bloom's Taxonomy of Learning in the correct sequential order (from lowest to highest level)?

1. Applying
2. Creating
3. Understanding
4. Remembering
5. Analyzing
6. Evaluation

A. 4, 1, 2, 5, 3, 6
B. 3, 4, 1, 5, 2, 6
C. 4, 3, 1, 5, 6, 2
D. 5, 4, 3, 1, 2, 6

8. Which of the following lists include the four basic elements of an objective in the ABCD learning objective model?

A. Action, Background, Context, Design
B. Audience, Behavior, Conditions, Degree
C. Assessment, Benchmark, Content, Delivery
D. Audience, Benchmark, Criteria, Description

9. This philosopher and educator believed that education depended on action-knowledge and that ideas emerge only in situations where learners have to draw upon their own experiences that have meaning and importance to them.

A. Pavlov
B. Maslow
C. Skinner
D. Dewey

10. Which of the following definitions describes formative assessment?

A. Assessment that is provided during the process of getting to an end result.
B. Assessment that looks at an end result rather than the process of getting to the result.

11. Which of the following are considered classroom assessment?

1. Tests
2. Minute Papers

3. **Quizzes**
4. **Self reflection exercises**
5. **Portfolios**

A. 1 and 3
B. 2, 4, and 5
C. 1, 2 and 5
D. All of the above.

12. Learner-Centered instruction requires that students actively engage in their own learning.

A. True
B. False

13. A "sage on stage" teaching model is defined by Barr and Tagg as _____.

A. Learner-centered teaching
B. Content-centered teaching

14. The following according to Barr and Tagg describes a learner-centered Learning Paradigm:

1. **Mission and Purpose: produce learning, elicit students' discovery and construction of knowledge, create powerful learning environments and achieve success for diverse students.**
2. **Teaching/Learning Structures: atomistic – parts prior to whole, 50-minutes lecture, 3-unit course, time held constant, classes start/end at same time, one teacher, one classroom, covering material, end-of-semester assessment, grading within classes by instructors, private assessment, degree equals accumulated credit hours.**
3. **Teaching/Learning Structures: holistic – whole prior to parts, learning held constant and time varies, environment ready when student is, cross-discipline, specified learning results, pre-/during/post-assessments, external evaluations of learning, degree equals demonstrated knowledge and skills.**
4. **Nature of Roles: faculty are primarily designers of learning methods and environments, faculty and students work in teams with each other, teachers develop every student's competencies and talents, shared governance-teamwork-independent actors.**
5. **Learning Theory: knowledge exists "out there," knowledge comes in chunks and bits – delivered by instructors and gotten by students, learning is cumulative and linear, fits the storehouse of knowledge metaphor.**

A. 1, 2, 4
B. 1, 2, 3
C. 2, 3, 4
D. 1, 3, 4

15. Which of the following best describes an essential skill students need when working with AI-generated content for patient care?

A. The ability to use evidence-based decision making (EBDM) to evaluate AI-generated information.
B. The ability to accept AI-generated content without additional verification.
C. The ability to rely solely on clinical intuition instead of external evidence.
D. The ability to use AI tools without understanding their limitations.

References

1. Blumberg P. Making learning-centered teaching work. (1st ed). New York. Routledge, 2019.
2. Han A, Laughter L, Iyer P, Radif M. A competency-based online curriculum mapping process for dental and dental hygiene education. J Dent Educ. 2022 Jan;86(53):1693-1695
3. Koshy E, Chandrasekharan Nair K, Dathan P et al. Competency based education – a narrative review. Acta Scientific Dental Sciences. 2024. 8.8:74-83.
4. Maart RD, Ada RZ, Frantz JM. Strategies to implement competencies as it related to a competency framework in a dental undergraduate curriculum: A systematic review. Eur J Dent Educ. 2023. 27:746-755.
5. Wiggins GP, McTighe J. Understanding by design (2nd ed). Chicago, IL. Pearson, 2005.
6. Fink LD. Creating significant learning experiences: an integrated approach to designing college courses. San Francisco, CA. Jossey-Bass. 2003.
7. Gadbury-Amyot CC, Godley LW, Nelson JW Jr. Measuring the level of reflective ability of predoctoral dental students: early outcomes. J Dent Educ. 2019; 83(3):275-80.
8. Dewey J. How We Think. Boston, MA. D.C. Heath & Co. 1910.
9. Piaget J. Biology and knowledge: an essay on the relations between organic regulations and cognitive processes. Chicago, IL. University of Chicago Press, 1971.
10. Vygotsky L. Mind in Society - The collected works of L. S. Vygotsky., Vol 1; Cognition and language: a series in psycholinguistics. Robert W. Rieber (Ed.). New York, NY. Plenum press 1987. Accessed April 2, 2020.
11. Ausubel DP, Novak JD, Hanesian H. Educational psychology: a cognitive view. New York,NY. Holt, Rinehart and Winston. 1978.
12. Forehand M. Bloom's taxonomy: Original and revised. In M. Orey (Ed.), Emerging perspectives on learning, teaching, and technology. Accessed February 6, 2026.
13. Anderson LW, Krathwohl DR. A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives. New York, NY. Longman. 2001.
14. Barr R, Tagg J. From Teaching to Learning - A new paradigm for undergraduate education. Change. 1995;27(6):12-25. Accessed April 2, 2020.
15. Gadbury-Amyot CC, Simmer-Beck M, McCunniff M, et al. Using a multifaceted approach including community-based service-learning to enrich formal ethics instruction in a dental school setting. J Dent Educ. 2006 Jun;70(6):652-61.
16. Shute VJ. Focus on Formative Feedback. Rev Educ Res. 2008 Mar;78(1):153-189. doi:10.3102/0034654307313795. Accessed February 6, 2026.
17. Svinicki MD, McKeachie WJ. McKeachie's teaching tips: strategies, research, and theory for college and university teachers, 13th ed. Belmont, CA. Wadsworth, Cengage Learning. 2011.
18. Merriam-Webster 2025 Word of the Year: Slop. www.merriam-webster.com/wordplay/word-of-the-year Accessed March 5, 2026.

Internet Resources

1. Commission on Dental Accreditation. Accessed January 12, 2026.
2. Dakota State University – Introduction to the ABCD Model for setting learning objectives. Accessed February 12, 2026.
3. Iowa State University Center for Excellence in Learning and Teaching - Revised Bloom's Taxonomy. Accessed February 13, 2026
4. Aligning Assessment, Learning Activities and Teaching Strategies. Accessed February 13, 2026
5. University of Michigan – Generative AI Essentials: Overview and Impact. Accessed February 13,

2026

Additional Resources

- No Additional Resources Available.

About the Author

Cynthia C. Gadbury-Amyot, MSDH, EdD

Dr. Amyot is Professor Emeriti, University of Missouri-Kansas City (UMKC), School of Dentistry. She taught for over 30 years at UMKC, serving two years as Interim Vice Provost of Online Education, and retired as Associate Dean of Instructional Technology and Faculty Development. She has taught at all levels of the curriculum; doctoral, predoctoral, graduate and undergraduate. Dr. Amyot has received numerous distinguished teaching awards from the School of Dentistry and was the recipient of the university wide Elmer Pierson Outstanding Teaching Award. She was awarded the Pfizer/ADHA Award for Excellence in Dental Hygiene in 2004, and named the recipient of the 2007 ADEA/William J. Gies Foundation Education Fellowship. Dr. Amyot is the recipient of the 2014 Alfred C. Fones Award, a national award recognizing outstanding achievement and dedication to the profession of dental hygiene. In 2020 she was awarded the American Dental Education Association (ADEA) Gies Award for Innovation – Dental Educator.
In 2025 Dr. Amyot was the receipient of the ADEA Chair of the Board of Directors Citation for her work on the International Women's Leadership Conference (ADEA IWLC).

Email: AmyotC@umkc.edu