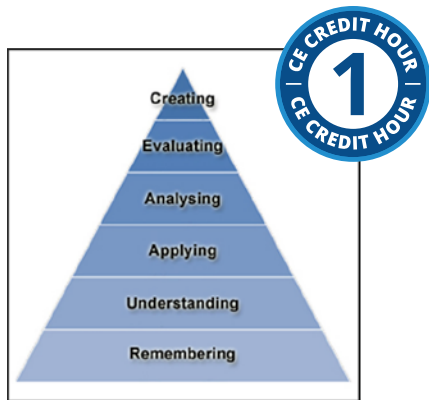


# Strategies for Developing a Quality Course: Teaching Methodologies/ Faculty Development



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**CE Credits:** 1 hours

**Intended Audience:** Dentists, Dental Hygienists, Dental Assistants

**Date Course Online:** 11/20/2012

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**Course Expiration Date:** 04/14/2023

**Cost:** Free

**Method:** Self-instructional

**AGD Subject Code(s):** 149

**Online Course:** [www.dentalcare.com/en-us/professional-education/ce-courses/ce398](http://www.dentalcare.com/en-us/professional-education/ce-courses/ce398)

**Disclaimer:** Participants must always be aware of the hazards of using limited knowledge in integrating new techniques or procedures into their practice. Only sound evidence-based dentistry should be used in patient therapy.

## Conflict of Interest Disclosure Statement

- The author reports no conflicts of interest associated with this course.

## Introduction – Developing a Quality Course

Strategies for Developing a Quality Course: Teaching Methodologies/Faculty Development will introduce participants to the latest strategies for course design with a focus on integration with curriculum and program competencies.

## Course Contents

- Overview
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## 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 as a whole.
- 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.<sup>1-4</sup> 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 member who is 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.

Dental education in the United States participates in professional accreditation through the Commission on Dental Accreditation (CODA). 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.<sup>5</sup> 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 (<http://www.ada.org/100.aspx>). 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.

See Table 2 for an example of a competency document followed by Table 3, a competency document demonstrating the relationship between courses, competencies 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 outlined in a book by Dee Fink titled: *Creating significant learning experiences: an integrated approach to designing college courses*.<sup>9</sup> In his book, Fink speaks of the “Backward Design” where the faculty member starts by thinking about what they would like to see as the end result of a student taking their course (Figure 1). Fink suggests that faculty 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

**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 Document (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					

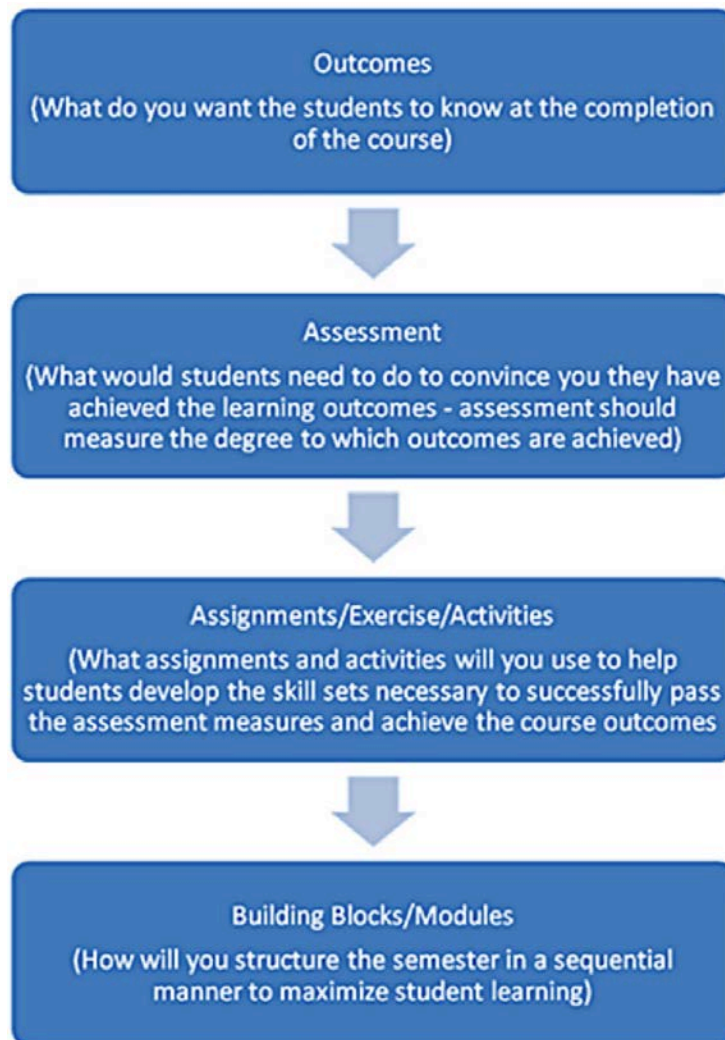
to build a course that will help students gain the knowledge, skills and values necessary to achieve the final result. In building one's course with the intent of creating significant learning experiences, it is instructive to remember the paradigm of student-centered learning, where the focus is on what students need to learn and do, rather than on what faculty need to teach. It is no longer acceptable for a faculty member to stand at the front of the room and lecture for the allotted course 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.<sup>7</sup> Dewey believed education depended on action-knowledge and ideas emerge only in situations where learners have 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

**Table 3. Competency document (demonstrating the relationship between courses, competencies and outcomes assessment).**

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



**Figure 1.** Backward Course Design.<sup>9</sup>

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).<sup>12,15</sup> 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.<sup>2</sup> 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 is new information is easily forgotten and not readily applied to problem-solving situations because it was not connected with concepts already learned. Meaningful learning requires more effort – the student must engage for meaningful learning to occur.



So, with the previous theory as background, let's return to Fink's Backward Design, where we started out by thinking about end points – what is it we want the students to take away from our course (**outcomes**). The answer to this question forms the basis of the learning goals or in Fink's model the outcomes (step one). The second step is to next 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 to which competencies their course is contributing. 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. 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. 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 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 competencies. 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 only includes a multiple-choice midterm and final examination as an assessment strategy, is not likely to achieve this goal. Instead, assignments would be built into the course that would provide students opportunities to build their skills in 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.

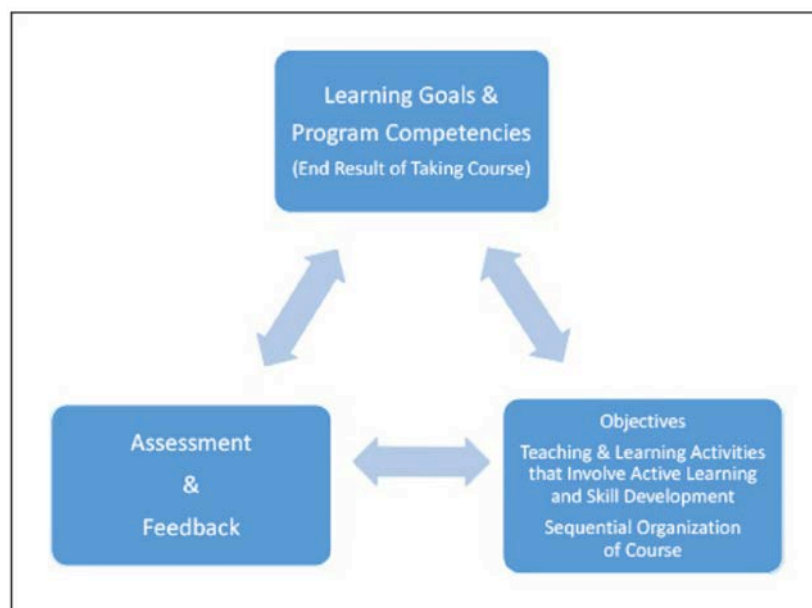


Figure 2. Integrated Course Design.

## Writing Course Objectives

With broad course goals (outcomes) as a starting point, the next step is the development of objectives that are performance based and measureable. 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.

Diamond refers to three basic elements of an objective:

- A verb that describes an observable action
- A description of the conditions under which the action takes place
- The acceptable performance level
  - States, where applicable, the standard for acceptable performance

An example of an objective as describe by Diamond would be:

Assess the need for dental radiographs of a new patient that presents to the dental clinic that follow the standards set by the American Academy of Oral and Maxillofacial Radiology, American Dental Education Association and U.S. Department of Health and Human Services.

In the objective above, “assess” serves as a verb that describes an observable action, “assessing the need for dental radiographs of a new patient;” with “dental clinic” describing the conditions under which the action takes place. The standards of the American Academy

of Oral and Maxillofacial Radiology, American Dental Education Association and U.S. Department of Health and Human Services provide an acceptable performance level.

A strategy for categorizing outcomes and, thereby, providing structure to objective writing is the use of a cognitive taxonomy and one of the best recognized cognitive taxonomies is that of Bloom's. 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).<sup>1</sup> Both the original and the revised taxonomies are shown in Figure 3. Differences to note are the change from nouns to verbs (e.g., Application to Applying) associated with each level. The categories *knowledge*, *comprehension* and *synthesis* from the old version were renamed as *remembering*, *understanding* and *creating*, respectively. Finally, the top two levels were switched, replacing what was *synthesis* in the old version to *creating* in the new version (now found in the new version at the top of the pyramid) and dropping evaluation from the top of the pyramid in the old version, to second from the top in the new version. 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

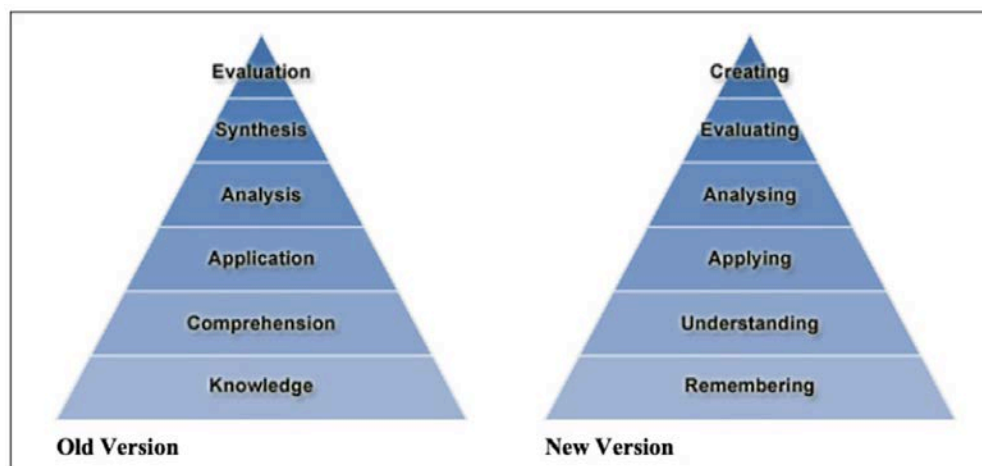


Figure 3. Bloom's Taxonomy of Learning.



**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
<b>Recognizing</b> • identifying  <b>Recalling</b> • retrieving • list	<b>Interpreting</b> • clarifying • paraphrasing • representing • translating  <b>Exemplifying</b> • illustrating • instantiating  <b>Classifying</b> • categorizing • subsuming  <b>Summarizing</b> • abstracting • generalizing  <b>Inferring</b> • concluding • extrapolating • interpolating • predicting  <b>Comparing</b> • contrasting • mapping • matching  <b>Explaining</b> • constructing models	<b>Executing</b> • carrying out  <b>Implementing</b> • using	<b>Differentiating</b> • discriminating • distinguishing • focusing • selecting  <b>Organizing</b> • finding coherence • integrating • outlining • parsing • structuring  <b>Attributing</b> • deconstructing	<b>Checking</b> • coordinating • detecting • monitoring • testing  <b>Critiquing</b> • judging • assessing	<b>Generating</b> • hypothesizing  <b>Planning</b> • designing  <b>Producing</b> • constructing

[\*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). They propose 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<sup>10</sup> 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. 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 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.<sup>6</sup> 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 provided by 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.<sup>13</sup>

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

**Table 5. Content-centered Instruction vs. Learner-centered Instruction.<sup>3</sup>**

The Instruction Paradigm (Content-centered)	The Learning Paradigm (Learner-centered)
<b>Mission and Purposes</b>	<b>Mission and Purposes</b>
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
<b>Criteria for Success</b>	<b>Criteria for Success</b>
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
Quality of faculty, instruction	Quality of students, learning

**Table 5. Continued.**

<b>The Instruction Paradigm (Content-centered)</b>	<b>The Learning Paradigm (Learner-centered)</b>
<b>Teaching/Learning Structures</b>	<b>Teaching/Learning Structures</b>
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
<b>Learning Theory</b>	<b>Learning Theory</b>
Knowledge exists "out there"	Knowledge exists in each person's mind and is shaped by individual experience
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

**Table 5. Continued.**

<b>The Instruction Paradigm (Content-centered)</b>	<b>The Learning Paradigm (Learner-centered)</b>
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
<b>Productivity/Funding</b>	<b>Productivity/Funding</b>
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
<b>Nature of Roles</b>	<b>Nature of Roles</b>
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 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*.

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.

McKeachie outlines nine assertions about assessing student learning that can provide guidance when considering assessment strategies when designing a course. 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 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 courset (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



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

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

venue for assessment strategies that go beyond quizzes and tests.

## 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/professional-education/ce-courses/ce398/test](http://www.dentalcare.com/en-us/professional-education/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 Commission on Change and Innovation
  - B. The American Dental Association Commission on Dental Accreditation
  - C. The Association of American Medical Colleges
  - D. The American Dental Association Joint Commission on National Dental Examinations
4. Order the following elements of course design as defined by Dee Fink 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. Order the following elements of the new version of Bloom's Taxonomy of Learning in sequential order:**
- 1. Applying
  - 2. Creating
  - 3. Understanding
  - 4. Remembering
  - 5. Analyzing
  - 6. Evaluation
- A. 4, 1, 2, 5, 3, 6
  - B. 4, 3, 1, 5, 6, 2
  - C. 3, 4, 1, 5, 2, 6
  - D. 5, 4, 3, 1, 2, 6
- 8. Diamond outlines three basic elements of an objective. They are:**
- 1. A verb that describes an observable action
  - 2. A description of the conditions under which the action takes place
  - 3. A noun that names the object
  - 4. The acceptable performance level
  - 5. Unacceptable performance level
- A. 1, 3, 5
  - B. 2, 3, 4
  - C. 1, 2, 4
  - D. 2, 3, 5
- 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. Dewey
  - C. Skinner
  - D. Maslow
- 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. Research has shown that teacher-made tests typically measure lower level learning, e.g., factual and recall.
- A. True  
B. False

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## Internet Resources

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4. Iowa State University Center for Excellence in Learning and Teaching – A Model of Learning Objectives. Accessed April 2, 2020.
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## Additional Resources

- No Additional Resources Available.

## About the Author

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