Competency-Based Education: A Framework for Measuring Quality Courses

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Abstract

The growth of competency-based education in an online environment requires the development and measurement of quality competency-based courses. While quality measures for online courses have been developed and standardized, they do not directly align with emerging best practices and principles in the design of quality competency-based online courses. The purpose of this paper is to provide background and research for a proposed rubric to measure quality in competency-based online courses.

Background

The impetus for this paper was a decision by the Information Technology and Administrative Management Department at Central Washington University to begin offering a competency-based program called FlexIT. As Central Washington University's first competency-based program, FlexIT required the translation of existing learning objectives into competency-based courses to be delivered online in a self-paced format with project-based assessments. The program remains course-based with credit equivalent to in-person and online courses offered by the department. When reviewing online competency-based courses, the authors discovered the absence of specific rubrics to measure quality in these types of courses.

Online is the fastest growing sector of higher education (Means, Toyama, Murphy, Bakia, & Jones, 2010). Online learning affords additional opportunities for demonstrating learning and achievement that go beyond those possible in a face-to-face setting. One such opportunity is that of competency-based education. Competency based education (CBE) seeks to evaluate a student's understanding of a topic through demonstrated mastery of the specific skills or learning outcomes related to the topic (U. S. Department of Education, n.d.). CBE allows students to master skills at their own pace and provides for a variety of methods of demonstration of skill mastery. Often demonstration is project-based, where students demonstrate mastery of a subject through the execution of high-level projects that test understanding on the subject at advanced levels. Technology plays a significant role in CBE by providing students with a platform that supports multiple learning tools and assessment opportunities.

Evaluation of student learning is a requirement for accreditation (The Higher Learning Commission, 2014). Continuous improvement efforts suggest that institutions evaluate their programs on a regular basis and make improvements as necessary. This evaluation includes a critical review of measurements intended to assure that students are achieving the stated learning outcomes. There are significant resources and requirements for evaluating student learning outcomes both face-to-face and online. Indeed, methods of evaluating student outcomes in competency-based education are often similar to those of evaluating student learning outcomes in traditional face-to-face or online modalities. Such measures include written papers, tests, and projects, to name a few. As important as it is to assess student learning outcomes, it is equally important to assess the design and delivery of courses to students intended to achieve these learning outcomes. This paper seeks to identify the differences associated with the evaluation of competency-based versus online course design and proposes a rubric that addresses the need for a different critical lens in this evaluation.

Problem Statement

The problem to be addressed in this paper is that while there are existing standards for evaluating the quality of online course design and delivery, there are no defined standards that directly address quality of competency-based courses. This problem is exacerbated because competency-based programs are often self-paced, requiring students to be more self-sufficient and self-directed than in instructor-led courses. Traditional online courses rely on student-to-student and student-to-faculty interactions through both synchronous and asynchronous methods. Competency-based courses often do not include such direct interactions, instead emphasizing self-paced learning and guided facilitation by a faculty mentor. High quality learning resources and learning activities, as well as rigorous assessments, are needed to assure these students successfully achieve mastery of the course competencies. With the growing popularity of competency-based course offerings, it is imperative to assure that these courses are designed to meet the needs of the students and the competency-based learning outcomes.

Existing Quality Assessment Programs

Numerous rubrics and tools exist for assessing quality online courses. These programs focus on course assessment using a variety of criteria. Some of these assessment programs look at quality as a continuous improvement process. Others focus on online course delivery (teaching), organization, and ease of use.

The University of Illinois, through its Illinois Online Network (ION) has developed a program for online course evaluation called the Quality Online Course Initiative. The purpose of this program is to improve the quality of online courses through an evaluation rubric, best practices, and faculty training programs (Illinois Online Network, 2010). The rubric measures online course quality across six categories: 1) instructional design; 2) communication, interaction and collaboration; 3) student evaluation and assessment; 4) learner support and resources; 5) web design; and 6) course evaluation. The full rubric can be found online at http://www.ion.uillinois.edu/initiatives/qoci/rubric.asp and is readily available to all universities interested in improving their online courses through evaluation and assessment.

The Quality Matters (QM) rubric is a proprietary tool that is used to measure the quality of online courses and outcomes (Quality Matters, 2014). The rubric developed from a FIPSE grant (Fund for Improvement in Post-Secondary Education) which began in 2003. Quality Matters became a self-supporting organization after the grant funds were exceeded. The fifth edition of the Quality Matters Rubric was released in 2014. There are two unique elements of the QM rubric. First, the focus of the process is on continuous improvement. Throughout the evaluation cycle, the opportunity for course revisions based on feedback is encouraged. Second, the rubric seeks to evaluate the alignment of course components such as learning objectives, assessments and measurement, instructional materials, learning activities/learner interactions, and course technology to assure that all work together to support learning outcomes (Quality Matters, 2014). The QM rubric is available for review and download at https://www.qualitymatters.org/node/2305/download/QM%20Standards%20with%20Point%20Values%20Fifth%20Edition.pdf. However this download is intended to be used as a one-time evaluation and is not to support ongoing course evaluations within the university.? In addition, to download the file, one must create an account with Quality Matters.. Individuals are encouraged to contact Quality Matters for information regarding the continued use of this tool. At present, Quality Matters offers assessment through a team of evaluators certified in QM principles and evaluation techniques. Although Quality Matters has announced a study to determine if a new rubric should be developed or if the existing QM rubric could be used to evaluate direct assessment or competency-based courses, no such determination has yet been made.

In 2002, California State University, Chico formed a committee to explore the need for "for demonstrating quality in online instruction" (California State University Chico, n. d., para. 1). As a result of the committee's efforts, guidelines were established for developing online courses which led to the Rubric for Online Instruction (ROI). The rubric can be used to design or evaluate either fully online or blended classes. The ROI helps evaluate online courses against six areas: 1) learner support resources; 2) online organization and design; 3) instructional design and delivery; 4) assessment and evaluation of student learning; 5) innovative teaching with technology; and 6) faculty use of student feedback (California State University Chico, 2014). The ROI is available through the Creative Commons license and can be adapted as needed.

There are many academic institutions that have developed their own assessment criteria and made these tools available for use by other institutions. These tools are often self-assessment tools to be used by the course developer or faculty. The Central Michigan University Quality Assurance Checklist is one such tool. Intended to be used by faculty to evaluate their online courses, the checklist helps faculty examine course structure, syllabus, content, usability, and learning community (Central Michigan University's Global Campus, n.d.). The University of Southern Mississippi Learning Enhancement Center offers faculty a tool for evaluating online courses based on established best practices (University of Southern Mississippi Learning Enhancement Center, n.d.). Finally, the Michigan Community College Association Virtual Learning Collaborative (2014) has developed a set of guidelines and an online rubric tool for use in evaluating online courses. These guidelines have been developed as a result of a review of documents from various accreditation commissions. Users self-assess in the areas of outcomes, construction, interaction, assessment, technologies, resources, maintenance, and development and support. The tool provides descriptive narrative criteria to help evaluators assess their level from beginning through exemplary.

The Need for a Different Rubric

Significant research exists to support the importance of student interactions in online courses (Ascough, 2002; Rhode, 2009). As a result, rubrics that assess the quality of an online course include an evaluation of the various dimensions of student interactions (University of Vermont, Center for Teaching and Learning, n.d.; TSU Online Course Evaluation Criteria, n.d.; Central Michigan University's Global Campus, n.d.). This measurement is not relevant in self-paced competency-based courses, as students do not engage in interactions with other students as a means of obtaining learning or transferring knowledge. Instead, the engagement is often one-on-one with a faculty-mentor and may occur outside of the online classroom environment. Additionally, existing rubrics address syllabus clarity and construction, course organization, aesthetics, and consistency (TSU Online Course Evaluation Criteria, n.d.). Although important to an online course, these measures are inconsistent with self-paced learning. In self-paced courses, students may skip around the course structure to obtain the learning resources they need As a result, addressing course organization from a structured, linear perspective is inappropriate for CBE courses as well. Finally, existing evaluation rubrics focus on instruction rather than outcomes (University of Vermont, Center for Teaching and Learning, n.d.; Central Michigan University's Global Campus, n.d.). Competency-based courses are focused on the demonstration of competency rather than assessment of learning. As a result, instructional effectiveness as a criteria is inappropriate for evaluation rubrics that assess competency-based courses.

The authors feel that existing rubric criteria for online courses that align well with competency-based course design

evaluation include the need for clear instructions for student success. This is even more important in courses where faculty do not maintain a regular presence or provide guidance for student learning and as a result, the student is expected to proceed through the course in a self-sufficient manner. This is especially true in the instructions students receive for demonstration assessments (Quality Matters, 2014). Because of the need for strong course design, as addressed in the literature review, the authors feel a new rubric should be proposed for evaluation of competency-based online courses.

Assessment of Quality in Competency-Based Education

As addressed above, there are a number of existing tools which provide information on how quality is measured in online courses. While these tools are helpful in ensuring consistency and best practices in online courses, they do not fully address quality in competency-based courses, which can be quite different than instructor-led and term-paced courses. Since learning outcomes are the foundation of all types of educational programs, and essential for competency-based programs, it is important to look at how student outcomes are developed and measured. In a report and survey by the Association for Governing Boards, 77% of organizations have a statement of expectations for what undergraduate students should learn (AGB, 2010). These statements provide a requirement for meaningful assessment of learning and provide standards to measure student performance (AGB, 2010).

The Council for Adult and Experiential Learning (CAEL), a nonprofit organization dedicated to helping people gain access to higher education, states that competency-based programs "are designed to improve the quality of higher education by putting the focus squarely on demonstrated learning outcomes." ("CAEL - Competency-Based Education," 2014, para. 4). In fact, Tucker, Neely, and Belcher (2013) suggest that the approach to creating a competency-based program starts with defining the competencies first, then the learning objectives, followed by the assessments for measuring the objectives as a means of assuring the emphasis always remains on demonstration of the competency. With this backwards-design approach to creating the learning environment, developers of CBE courses are far less focused on creating the learning content than on developing valid outcomes and reliable assessments. CBE focuses on the "learning, rather than on time spent in class or on materials" (Competency-Based Education Network, 2014, para. 1).

Figure 1: Hierarchy of Post-secondary outcomes (Jones et al, 2002)
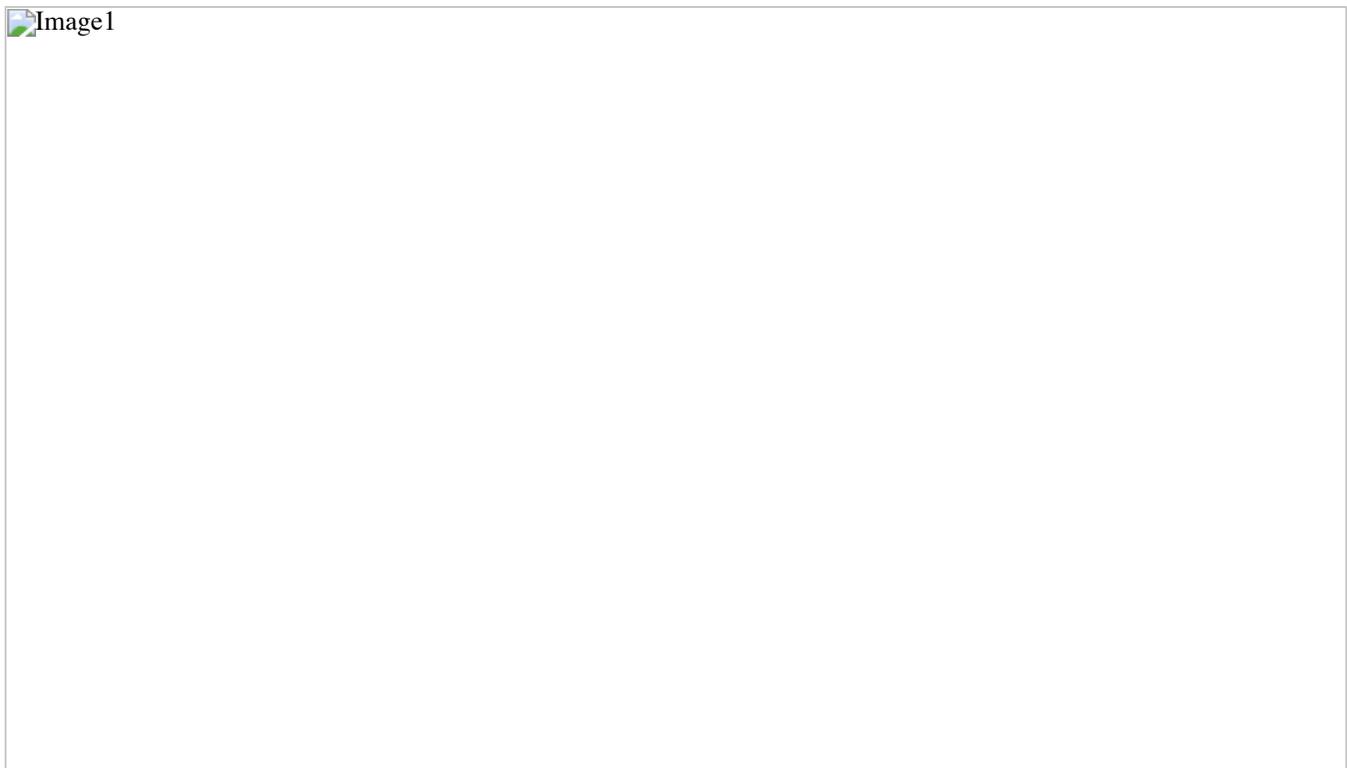
In the hierarchy of post-secondary outcomes (Jones et al, 2002), traits and characteristics of individual learners form the foundation of learning. As Soares (2012) explains this conceptual learning model, through the learning process students develop skills, abilities, and knowledge, the outcome of that process is the attainment of competencies, demonstrations result from the application of the competencies, and assessment takes place at all stages. Competency-based education programs have competencies and demonstrations as core components, and summative assessments of those components, but they may not provide measures on skills, abilities, and knowledge. This is where the gap in learning outcomes might be found in competency-based courses: we can measure competencies and see demonstration of that competency, but ongoing assessment is required to know if skills, abilities, and knowledge have been gained to complete the upper levels successfully.

In a competency-based environment, learning outcomes are paramount to creating quality programs and courses.

However, before we can begin measuring learning outcomes through assessments, we must ensure competency-based education "courses" provide all of the necessary tools to ensure the learning outcomes can be met. In other words, course developers must provide a quality competency-based course, learning resources, and learner support to ensure students are able to demonstrate their learning. Learning outcomes are only one part of the larger competency-based education puzzle. Because of this, the focus of this paper and the proposed rubric will be on evaluation of competency-based course design, rather than evaluation of course delivery and assessment of learning outcomes.

What Makes a Quality Competency-Based Course?

Now that we have addressed the hierarchy of post-secondary outcomes, we can begin to develop a framework to answer the question, what makes a quality competency-based course?

A number of principles distinguish competency-based education programs from in-person classes or online courses. These principles are important to consider when reviewing competency based programs and courses for quality. Competency-based programs and courses affirm:

- The student's ability to not only "know" but "do" (Adelman, 2013)
- Competency-based assessment validates learning (Klein-Collins, 2013)
- Competency-based programs focus on learning rather than time spent (LeBlanc, 2013)
- Learning is student-centered in terms of flexibility and personalization (Klein-Collins, 2013)
- Students are able to learn at a variable pace and are supported in their learning (Johnstone & Soares, 2014)
- Use of technology for teaching and learning (Mendenhall, 2012)
- Effective learning resources are available anytime and are reusable (Johnstone & Soares, 2014)
- The faculty role changes (Mendenhall, 2012)
- Valid, reliable assessments are a key component (Mendenhall, 2012)

Because of these principles, the rubric used to determine the quality of a competency-based course will necessarily be different than one used to measure instructor-led and term-paced online courses. Because competency-based courses are often self-directed and self-paced, there are no requirements for introductions, class communications, and direct instruction. Instead, the faculty role in competency-based courses is often disaggregated into course developer, mentor, and evaluator, so these roles need to be disaggregated on the quality measurement rubric as well, with the course developer involved in selection of learning resources and creation of assessments, the mentor providing instructional support and ongoing feedback during the learning process, and the evaluator completing the assessment of competency achievement. Interaction takes place between learner and content, through learning activities that support active learning, rather than between learner and peers or learner and instructor. Competencies and learning objectives take priority in the course design and must identify measurable knowledge, skills, and abilities to be demonstrated by learners. Learning activities must support the achievement of those competencies. Assessments must be rigorous and valid measures of the learner's mastery of competencies and learning objectives, with rubrics that provide detailed criteria for evaluation and requirements to achieve mastery-level. Assessment of competencies usually take place through summative project-based assignments or a portfolio of student work; however, there should also be opportunities for ongoing, formative assessment and practice by the learner prior to the final evaluation in order to track progress towards achievement of competencies and learning objectives. Learning resources should support achievement of the competencies and be flexibly available any time learners need them. Technology tools and media should support personalized learning pathways towards the attainment of required knowledge, skills, and abilities. As with all online courses, competency-based online courses need to provide technical, accessibility, and academic support for learners. Likewise, competency-based online courses must demonstrate a commitment to accessibility and usability for all students and comply with institutional polices.

Proposed CBE Rubric

Based on the literature review and principles outlined above, the authors propose a quality measurement rubric designed to meet the specific requirements of competency-based programs and courses. This proposed rubric will be utilized to evaluate new competency-based courses at Central Washington University, and quantitative data will be gathered for a future research study on the applicability of this rubric.

The authors believe that by using this rubric, colleges and universities can measure the quality of CBE programs, taking into account the differences between instructor-led and term-paced online courses and online courses which are competency-based. This proposed rubric (figure 2) aligns with best practices in both online education and competency-based education, based on the following major rubric headings:

- Competencies & Learning Activities
- Assessment & Evaluation
- Learning Resources
- Technology & Navigation
- Learner Support
- Accessibility
- Policy Compliance

Figure 2: Proposed CBE Rubric

1. Competencies & Learning Activities
Competencies and learning objectives are measurable and aligned with learning activities.

IM = Improvement Needed EF = Effective, EX = Exemplary	IM	EF	EX	Notes/Recommendations
1. Competencies and learning objectives identify measurable knowledge, skills, and abilities to be demonstrated by learners				
2. Learning activities support achievement of competencies and learning objectives				
3. Instructions on how to complete learning activities and meet competencies are clear				
4. Learning activities provide opportunities for interaction with content for active learning				

2. Assessment & Evaluation

Assessments measure mastery of competencies with specific evaluation criteria.

IM = Improvement Needed EF = Effective, EX = Exemplary	IM	EF	EX	Notes/Recommendations
5. Assessments are rigorous and valid measures of learners' mastery of competencies				
6. Requirements are clearly stated for achieving mastery-level on competencies				
7. Assessment rubrics provide detailed and specific guidelines and criteria for evaluation				
8. Learners have opportunities for ongoing assessment and practice with mentor feedback				
9. Expectations for evaluator's response time and feedback on assessments are clearly stated				

3. Learning Resources

Learning resources support achievement of competencies and learning activities.

IM = Improvement Needed EF = Effective, EX = Exemplary	IM	EF	EX	Notes/Recommendations
10. Learning resources support achievement of competencies and learning objectives				
11. Use of learning resources (required and optional) for learning activities is clearly explained				
12. Learning resources are current, flexibly available, and appropriately cited				

4. Technology & Navigation

Course technology and navigation support personalized learning pathways.

IM = Improvement Needed EF = Effective, EX = Exemplary	IM	EF	EX	Notes/Recommendations
13. Tools and media support personalized learning pathways to attain required knowledge, skills, and abilities				
14. Navigational structure of course is explained, logical, consistent, and				

efficient				
15. Students can readily access technologies required in the course with instructions provided				
16. Minimum technology requirements and technical skills are clearly stated				

5. Learner Support
Course facilitates access to support services essential to student success.

IM = Improvement Needed EF = Effective, EX = Exemplary	IM	EF	EX	Notes/Recommendations
17. Instructions are provided on how to access technical support services				
18. Instructions are provided on how to obtain accessibility support services				
19. Instructions are provided on how to access academic support services (e.g., Library, Writing Center, Tutoring)				
20. Instructions are provided on how and when to contact mentor for instructional support				

6. Accessibility
Course demonstrates a commitment to accessibility and usability for all students.

IM = Improvement Needed EF = Effective, EX = Exemplary	IM	EF	EX	Notes/Recommendations
21. The course provides learning resources in alternative formats for diverse learners				
22. The course follows universal design principles for usability				
23. The course design accommodates the use of assistive technologies				

7. Policy Compliance
Course complies with institutional policies.

IM = Improvement Needed EF = Effective, EX = Exemplary	IM	EF	EX	Notes/Recommendations
24. The course materials comply with Copyright Policy				
25. The course complies with Intellectual Property Policy				
26. The course complies with FERPA Policy				

Conclusion

Preliminary implementation of the proposed rubric for quality assurance review of competency-based courses in the FlexIT program at Central Washington University revealed a number of areas for improvement in initial course design. First, many of the existing learning objectives needed to be rewritten for competency-based courses so that they were specific and measurable to identify how the learner would demonstrate that a given competency had been mastered. Second, particularly for courses with project-based final assessments, scaffolding activities and milestones needed to be identified for submission of preliminary project drafts to provide opportunities for learner practice and feedback from the mentor. Third, in self-paced courses where learning activities and resources are optional for learners to access based on their needs, additional information needed to be provided on how the activities and resources would help learners master the required competencies. Finally, some courses needed to more clearly align the evaluation criteria on the final assessment rubric with the competency learning objectives and make the criteria more specific with a range of

evaluation to measure competency mastery. The proposed rubric thus provided clear guidance for course developers and peer reviewers to address the specific requirements of competency-based course design.

From the perspective of a competency-based program administrators, this preliminary research is important for several reasons. First, the design of competency-based courses is key to success of the program. Without good course design, students may struggle with the course content. For example, upon initial implementation, it was found some of the final assessments did not completely reflect the course materials provided; therefore, additional materials needed to be added on specific topics. A rubric geared specifically to address the different student needs in a competency-based program is necessary to create quality courses. Second, understanding the best practices in developing competency-based courses can assist those leading a competency-based program initiative in addressing the differences between a competency based "course" and a traditional course with faculty mentors, especially during the initial phases of program adoption. For example, sharing a sample course with faculty and mentors allowed them to have greater understanding of what is expected in both mentoring and course development. It also allowed them to see how a student might progress through the course. Quality course design assists in the effort of greater understanding by those involved in any type of course development and mentoring. Finally, such a rubric allows faculty course developers to understand the expectations (and differences) in design of competency based, self-paced courses. For example, we found some faculty were utilizing "somewhat real time" assessments, such as discussion boards and lab assignments, which understandably does not meet the objectives of a self-paced, competency-based program. Training and checking for understanding from faculty who will be developing courses will saves time and money for the department.

While there are many rubrics and tools available for quality assessment of online courses, this paper presented an option for quality assessment of competency-based online courses. Based on the growth of competency-based education and the importance of assessing quality in competency-based courses, the authors suggest that a quality measurement instrument is needed that is different from those used for instructor-led and term-paced online courses. This paper provided a proposed rubric to measure quality in competency-based online courses in order to address this need.

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