

Grading Rigor in Counselor Education: A Specifications Grading Framework

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According to accreditation and professional bodies, evaluation and grading are a high priority in counselor education. Specifications grading, an evaluative tool, can be used to increase grading rigor. This article describes the components of specifications grading and applies the framework of specifications grading to a counseling theories course.

Regarding didactic and clinical experiences, evaluation and grading are important areas of curriculum in counselor education. The American Counseling Association's (ACA, 2014) *ACA Code of Ethics* dictates that counselor educators provide students with "the levels of competency expected, appraisal methods, and timing of evaluations for both didactic and clinical competencies" (Standard F.9.a.). The Council of Accreditation for Counseling and Related Educational Programs (CACREP, 2016) agrees in stating that course syllabi must contain student evaluation criteria and procedures for grading. Further, CACREP (2016) provides guidelines for programs to teach doctoral students about "instructional and curriculum design, delivery, and evaluation methods relevant to counselor education evaluation methods pertaining to counselor education" (Section 6.B.3.d.).

CACREP (2016) standards provide guidelines in the eight areas of counseling competence which are: professional counseling orientation and ethical practice, social and cultural diversity, human growth and development, career development, counseling and helping relationships, group counseling and group work, assessment and testing, research and program evaluation.

However, these guidelines offer very little direction to counselor educators on how to evaluate knowledge and skill outcomes. CACREP (2016) asserts that individual counselor education programs should ultimately decide on how they want to meet the standards.

Despite emphasis on evaluation, McAuliffe and Eriksen (2011) state there has not been much formal training concerning teaching for faculty. Even though counselor educators spend inordinate amounts of time grading; grading rigor in counselor education has not been addressed. Other fields have similar problems in the training of faculty, evaluation, and grading rigor. With little research on grading in counselor education, many counselor educators follow the assumptions of traditional systems of grading.

One assumption of the traditional grading system is that there is a strong correlation between grades and student learning outcomes. Institutions of higher learning and employers tend to agree with the correlation of grades, student learning outcomes, and assessment (Nilson, 2015). Employers have historically thought grades correlated with job performance, but Samson, Graue, Weinstein, and Walberg (1984) have shown that GPAs were only responsible for 2.4% variance in career success. In higher learning, one would assume that the bestowal of academic diploma would demonstrate that students have mastered all the competencies in their fields of study. However, the American Institute of Research (2006) noted that fewer than 50% of four year graduates and less than 25% of two year graduates demonstrated literary proficiency. Additionally, between the 1980's and 2000's, GPAs have increased significantly while studying time has decreased by 50% (Babcock, 2010). During the late 1990's, law schools were so skeptical of grades that many depended

heavily on standardized tests rather than grades for admission (Wongsurawat, 2009).

Lack of academic rigor by faculty has been cited as a major reason for grades not representing competence (Gordon & Palmon, 2010; Schnee, 2008). Passing grades do not necessarily mean students have achieved learning outcomes because faculty may give students passing but lower grades because students have not achieved learning outcomes. (Nilson, 2015). Nilson (2015) has proposed specifications grading which is a precise evaluative tool constructed to increase grading rigor. The purpose of this paper is to explain the components of specifications grading and to demonstrate how specifications grading can be utilized in counselor education.

Specifications Grading

Specifications grading is a grading procedure which requires students to fulfill certain requirements for an assignment to be acceptable. Specifications grading seeks to improve rigor, reduce grade inflation, and save instructors time in grading (Nilson, 2015). The underlying framework for specifications grading is backward course design. Backward course design involves a three step process: identifying desired results, determining acceptable evidence, and planning learning experiences (Wiggins & MaTighe, 2005). First, instructors must identify student learning outcomes and what instructors desire in student learning and performing by the end of the course (Anderson & Tredway, 2009; Cobia, Carney, & Shannon, 2011; Daugherty, 2006; Davidovitch, Yavich, & Keller, 2014). Second, the evidence for student knowledge would be demonstrated by the instructor choosing assessments and learning activities (Anderson & Treadway, 2009; Daugherty, 2006; Davidovitch, Yavich, & Keller, 2014). Third, instructors would plan learning experiences and

instructional methods that support learning outcomes. (Anderson & Treadway, 2009; Daugherty, 2006; Davidovitch, Yavich, & Keller, 2014).

Using backward course design, elementary preservice teachers have reported feeling more prepared, producing clearer instruction, and attaining higher performance in designing plans connected with learning experiences than teachers who utilized traditional course design (Graff, 2011; Kelting-Gibson, 2005). Additionally, pre service teachers exposed to backward course design have demonstrated higher levels of performance in content knowledge, connection of content between various disciplines, and higher awareness of resources (Kelting-Gibson, 2005). Nursing students provided high ratings for teachers and positivity toward backward design (Bennett, Kennedy, & Donato, 2011).

The underlying frameworks of specifications grading which support specifications grading are student learning outcomes, pedagogy, mastery learning, assessments, competency-based grading, and contract grading. An understanding of each of these elements is necessary in employing specifications grading.

Student Learning Outcomes

Student learning outcomes are the measureable behaviors which students should be able to perform by the end of the course. In basic course design, communication of clear student learning outcomes is a necessity (Fox, 2010). Nilson (2015) states the best words to use for outcomes are not internal words like understand, know, or learn, but words such as reproduce, explain, apply, analyze, or synthesize. Therefore, student learning outcomes are not based on simply what students will be doing, but how they will be performing the outcomes. Mastery learning, competency-based grading, and contract grading all utilize detailed student learning outcomes as a starting point for course design

(Cooperman, 2011; Diegelman-Parente, 2011). In the development of student learning outcomes, instructors need to employ a sound pedagogy to design effective courses.

Pedagogy

For many college professors, one neglected area in teaching is having a sound pedagogy to implement. Nilson (2015) promoted four cognitive based frameworks: Perry, Bloom, Anderson and Krathwohl's Revision of Bloom's Taxonomy, and Wolcott and Lynch. These four models provide theories behind the development of student learning outcomes. By no means are these models exhaustive, because there are many models of teaching and learning, but the main focus is that instructors should be operating from a theoretical pedagogy. The four models mentioned are suggestions for instructors to consider.

The Perry model involves four epistemological stages of learning which are: dualism, multiplicity, relativism, and commitment (Perry, 1999). Dualism can be defined as thinking that education simply involves recalling facts, figures, and memorization of vocabulary words. Multiplicity is having uncertainty about the answers to problems, but the problems are solvable and experts just have not found the answers. Relativism is the idea everyone has their own opinion so there is not really a right or wrong because all opinions are limited. The stage of commitment is the learner making a commitment to a position after reviewing the pros and cons of different points of view.

Since the field of counseling might be new to students; their learning curve may begin with dualism and progress to commitment as they acquire more experience in the field (Granello, 2002, 2010). Instructors can construct learning outcomes and assessments consistent with the epistemological level of students for maximum acquisition of knowledge and skill development. Whereas Perry's model

focuses on how people think; Bloom, Anderson, and Krathwohl emphasize the performance of people in their stages of learning.

Bloom (1956) proposed six levels of thinking which are: knowledge, comprehension, application, analysis, synthesis, and evaluation. The task of knowledge is the ability to memorize and recall facts. Comprehension is being able to summarize or discuss topics in one's own words. Application involves solving, applying, or utilizing information to provide solutions for problems. Analysis is the ability to dissect components of a subject matter and draw conclusions. Synthesis is the task of finding relationship between components of a subject. Evaluation is judging or assessing information against criteria. Anderson and Krathwohl (2000) modified Bloom's taxonomy with actions rather than nouns with the levels of remembering, understanding, applying, analyzing, evaluating, and creating. Instead of evaluation being the highest level, they named creating as the highest level of thinking and omitted synthesis. Creating involves constructing a new structure or deriving new meaning. Whereas, Wolcott's framework incorporates the thinking levels of Bloom's or Anderson and Krathwohl, Wolcott (2003) describes the higher levels of evaluating and creating in more detail.

The Wolcott (2003) framework contains four steps; which demonstrate how information is handled: identifying, interpreting, prioritizing, and re-visioning. Identifying information involves describing information and proceeding as if there is only one correct answer. Exploring information encompasses analyzing, synthesizing, and evaluating data. In contrast to Bloom or Anderson and Krathwohl, the Wolcott framework views the higher thinking levels like analyzing, synthesizing and evaluating as elementary (Nilson, 2015). The third level, prioritizing, includes providing informed conclusions, assessing risks, constructing policy, and

implementing plans. Re-visioning is future oriented and involves processes of program evaluation and monitoring, recognizing restrictions, and developing plans for the future. Again, these cognitive frameworks can be the basis for the creation of measureable student learning outcomes.

There are some commonalities between the activities of these four frameworks which can be helpful in understanding the trajectory of student learning. The first area of commonality is the idea of students believing there is one correct answer which is indicated in the dualism and multiplicity of Perry, knowledge and comprehension in Bloom or Anderson and Krathwohl, and identifying in Wolcott. A second area of similarity is students seeing correct answers as situational which are shown in the relativism of Perry, higher order thinking (applying, analyzing, and synthesizing) of Bloom or Anderson and Krathwohl, and exploring in Wolcott (Nilson, 2015). Another level of student epistemology is drawing conclusions which are demonstrated in commitment by Perry, evaluating in Bloom or Anderson and Krathwohl, and prioritizing in Wolcott. These commonalities, though not exhaustive, provide a broad view of how instructors can evaluate student levels of learning and develop learning outcomes which are consistent with pedagogy. Once there are measureable student learning outcomes, these outcomes can be connected with assessments.

Assessments

In course design, following the identification of student outcomes, assessments would be added as a demonstration of student achievement. There are two different types of assessments: formative assessments and summative assessments (Perara-Diltz & Moe, 2014). Formative assessments are continuous assessments given during the semester; summative assessments are the end product of a

semester like a final exam or project. Fox (2010) asserts students may wonder why they are doing certain assignments and sometimes students see tasks as “busy work.” Therefore it is essential to connect assessments and activities to student learning outcomes (Cobia, Carney, & Shannon, 2011). Chun (2010) adds teaching and assessments should align with one another therefore teachers should teach to the student outcomes. Mastery learning is a method of instruction which can be utilized in specifications grading and it connects teaching, assessment, and student learning outcomes (Nilson, 2015).

Mastery Learning

The basis of mastery learning is all students can learn even though they may learn at different rates; instruction is highly individualized (Cooperman, 2011; Guskey, 1980, 2010; Melton, 2008). Mastery learning promotes the idea that students learn best through sequentially mastering course concepts and material is broken into units to assess the effectiveness of group instruction and student learning (Block, 1980; Diegelman-Parente, 2011). Increased achievement among fields such as mathematics, chemistry, physics, and business can be attributed to the utilization of mastery learning (Hoon, Chong, & Ngah, 2010; Lamadi, Olyelekan, & Olurundare, 2015; Melton, 2008; Wambugu & Johnson, 2008). Elements of mastery learning include the following: group instruction, formative assessments, and corrective activities. The process of mastery learning begins with giving students an initial assessment to evaluate how well students know concepts (Guskey, 1980, 2010). Following the initial assessment, the instructor can use group instruction, lecturing, presentations, or student centered team building to address the deficits in knowledge of course concepts. After students have experienced group instruction they demonstrate their mastery of content through formative

assessments. From this second assessment, instructors provide students with corrective feedback to show if students have mastered the material. If students master the material, they can progress to more enrichment, but if students do not master material, they should retest. While mastery learning is an underlying instructional method, competency-based grading is the evaluative tool in specifications grading (Diegelman-Parente, 2011; Nilson, 2015).

Competency-Based Grading

Competency-based grading is an evaluative tool in which the instructor determines the acquired skills, knowledge, and abilities students must attain to pass a course (Diegelman-Parente, 2011; Vorhees, 2001). Vorhees (2001) describes the elements of competency-based grading as: traits and characteristics, skills, knowledge, ability, competence, and demonstration. Traits and characteristics are the endowed qualities students possess prior to entering a course. Skills, knowledge, and abilities are what students develop during pedagogy and the learning process through participation and work. After being exposed to skills, knowledge, and abilities, students acquire competence through integrative learning experiences (Vorhees, 2001). The apex of competency-based grading is the application and demonstration of the acquired competencies. Through competency-based grading, a minimal competence is determined by the instructor; competency-based grading can provide and empower students with clear standards concerning satisfactory performance. Students may choose to work at the minimal level or strive for higher proficiency to obtain higher grades.

Bundling assignments is a method used in competency-based grading. To bundle assignments means instructors put assignments together that indicate learning outcomes. These learning outcomes are also associated with grades. One way to employ bundling is by having A-bundles,

B-bundles, or C-bundles; each bundle becomes more highly complex in association with a grade (Reed, 1979). A C-bundle may simply want students to have knowledge and comprehension of a subject; a B-bundle desires students would be able to apply and analyze knowledge; an A-bundle would require students to synthesize and evaluate knowledge. These bundles are graded on a pass-fail basis and students can choose the bundle they want to pursue. Students do not have to inform instructors about their bundle; their work will show their choice.

Students have demonstrated positive reactions to competency based grading in the ability to choose grades, standards, and to gain as little or much proficiency as they wanted from a course (Reed 1979). Some teachers have expressed reservations about competency based grading and have doubts, while other faculty found competency grading quite effective (Chambers, 1999; Richards, 2014). Since students have the ability to choose how much proficiency or competence they desire from a course, elements of contract grading are prominent in competency based grading.

Contract Grading

Contract grading is a form of evaluation where the instructor defines the standards for levels of grades and students sign contracts stating they will meet the standards (Boe, 2010). Contract grading has been theorized to give students responsibility, increase motivation, and effort (Polczynski & Shirland, 1977). The choice helps students to focus on learning, the grading process, and connecting grading to critical thinking and students have shown a preference for contract grading in comparison to traditional grading (Brubaker, 2010; Hiller & Hietapelto, 2001).

Specifications Grading Summary

Course grades should be indicators of the quantity and/or quality of learning outcomes students have attained in a given course and specifications grading provides rigor in connecting assessments to learning outcomes. Specifications grading contains elements of competency-based grading, contract grading, mastery learning, and emphasis on learning outcomes. The relationship between competency based grading and specifications grading is that competency-based grading includes minimal competencies for the entire course, while specifications grading refers to competencies for individual assessments.

The process of specifications grading is that instructors evaluate the work of students based on requirements constructed for assessments. The element of competency-based grading within the assessment is that students must meet criteria for a given grade. Contract grading is also related to specifications grading because in an assessment, students can choose what grade they desire by the amount of work they perform. Mastery learning is an optimal teaching method in specifications grading because its emphasis on assessment. Learning outcomes are the foundation of the evaluative tools of contract grading and competency-based grading, and the method of instruction which is mastery learning. Teaching philosophies and accreditation standards are blueprints for outcome creation. The following example will demonstrate an application of specifications to a counseling theories course.

Building a Counseling Theories Course Utilizing Specifications Grading

A specifications grading course is relatively simple to construct in counselor education and the syllabus provides the framework. CACREP (2016) standards dictate syllabi

should include: 1) content area 2) knowledge and skill outcomes 3) methods of instruction 4) texts/materials 5) evaluation criteria and procedures and 6) disability accommodations policy. For the purposes of demonstrating specifications, Nilson (2015) asserts a backward course design that involves the following order: student learning outcomes, assessments, methods of instruction, and evaluation procedures. The application of specifications grading in this example will involve a counseling theories course which comprises teaching students about models and theories of counseling.

Student Learning Outcomes

The first step in creating a specifications grading course is creating student learning outcomes. CACREP standards provide general guidelines for knowledge and skill outcomes (Cobia, Carney, & Shannon, 2011). In choosing outcomes for a counseling theories course, there are certain guidelines which were selected. These guidelines include students possessing knowledge and skills in the following three areas: theories and models of counseling, evidence-based counseling strategies and techniques for prevention and intervention, and the development of a personal model of counseling (CACREP, 2016).

From these guidelines, the teaching philosophy of Bloom's Taxonomy is utilized with the operative word being students have knowledge and skills in the three areas. Knowledge and skills are vague words, so the instructors' tasks are to show how students will demonstrate knowledge and skills. Regarding having knowledge of counseling theories, students will need to recognize and reproduce these concepts; therefore, the learning outcome would involve reproducing and memorizing concepts. For the guideline of students having knowledge and skills involving evidence-based strategies for intervention and prevention with clients,

students can apply theories to simulated or real life problems. One learning outcome from this guideline would be that students would apply theories to a variety of circumstances in counseling.

The guideline which includes students developing their own personal theories of counseling can include the creation of their own counseling theory. There are a few tasks students need to perform in order to create their own theory which includes: memorizing, comprehending, applying, analyzing, synthesizing, and creating.

Assessment

After selecting student learning outcomes, assessments can be connected to measure the learning outcomes. The outcome of students memorizing and recognize counseling theory concepts can be linked to quizzes, a mid-term, or a final exam. Students being able to apply techniques and strategies of counseling theories to different clinical situations can be measured by case studies and problem-solving activities. In developing their own personal models of counseling the assessment measure could be a paper which demonstrates understanding, application, analysis, synthesis, and creation of one's own counseling theory.

Method of Instruction

After adding the assessments to the outcomes, the teaching moves and instructional methods can be developed to complement outcomes. The teaching move which is promoted for specifications grading is mastery learning. With the outcome of reproducing and memorizing concepts, students could play games in class where they must remember concepts of theories. Another method which could be used is students listening to a lecture and writing a one-minute paper on their understanding of the lecture concerning a theory. After the paper, there could be a discussion on what they

understood or did not understand. There are a variety of ways students can demonstrate that they have understood course content.

Application of techniques for prevention and intervention can be demonstrated through teaching moves which include students solving case studies together. Instructors can facilitate the discussions about the case studies. Another way to show application is by students trying to use a theory on a mock client. Analyzing and synthesizing can be demonstrated by students writing reflection papers and being triggered by questions in class in order for students to discuss their worldviews and views of human nature. These are a few examples of how the methods of instruction in mastery learning can complement the student learning outcomes.

Evaluation Procedures and Criteria

Competency-based grading evaluates the entire course to assess if a student has met all the necessary competencies to receive a passing grade in a course. For the theories course, the student must be able to reproduce theoretical models of counseling, apply these theoretical models to clinical situations, and develop their own theory of counseling. Competency-based grading demonstrates the acceptable level at which students must perform and this could be attached to a grade, for example a student may need to receive an average of 80% on all quizzes to pass the course to show knowledge of a theory. For application, the student needs to pass all of their case studies and follow all directions. Regarding the development of their own theory, students need to perform acceptably on their term paper.

While competency-based grading assesses how students perform as a whole in passing a course, specifications grading incorporates what students need to do on each individual assignment. Percentages on quizzes, mid-

terms, and final exams are self-explanatory, but case studies require a bit more detail. When students review case studies, instructors can provide word count guidelines, depth of answers for detail, and grammar instructions. If students do not fulfill all instructions or specifications, they do not get credit for the assignment. Specifications grading as a division of competency-based grading shows students the exact procedures for how they will be graded.

Nilson (2015) also discusses how students can be graded according to bundles. Bundling is when similar assignments regarding outcomes are grouped together. For example, assignments involving reproducing, recognizing, and memorizing information are bundled together in obtaining a certain level of knowledge on assessments like quizzes. There could be a group of case studies which can be bundled together for application and students have to achieve a certain level according to specifications. Students might have the choice to perform all these assignments at one time if the assignments are not sequential. If assignments are in modules, student may have to master a group of assignments before moving to the next module which is the mastery learning concept of bundling or grouping outcome measures.

Recommendations for Future Research

Since there is virtually no research on grading rigor in counselor education, there are many areas concerning pedagogy which can be explored. Areas which merit investigation are descriptive studies which involve the pedagogies of counselor educators, methods of instructions employed in courses, assessment to demonstrate mastery of course content, and evaluative tools such as rubrics. These areas can be examined through the lens of the courses counselor educators teach. Another area of inquiry could be students' attitudes, achievement, and motivation toward the evaluation process. Courses can be compared with traditional

grading and specifications grading to examine if students' motivation, achievement, or attitudes are different in comparing the specifications grading model and the traditional grading model

Conclusions

In conclusion, specifications grading and its underlying components of learning outcomes, pedagogy, assessment, mastery learning, competency based grading, and contract grading have been summarized. This article has demonstrated the application of specifications grading to a counseling theories course. Specifications grading can be used as an evaluative tool to increase grading rigor in counselor education and its underlying components are adaptable to areas of in counselor education syllabi like learning outcomes, methods of instruction, and evaluation procedures. The learning outcomes of specifications grading are synonymous with the knowledge and skill outcomes of CACREP syllabi. Mastery learning, an instructional method, can be employed in counselor education because of its emphasis on group instruction, assessment, and corrective feedback. ACA (2014) asserts counselor educators should provide students with consistent and ongoing feedback.

Grading according to minimal standards which is supported by specifications grading and its underlying components is consistent with minimal standards for practice being met in the field of counseling. In order to practice in the field, counselors have to be licensed and/or certified. Many state licensing boards require prospective counselors to take exams demonstrating minimal competence which should be reflected in course work. The elegance of specifications grading is that it links assessment, methods of instruction, and grades explicitly to student learning outcomes. This can result in more precise grading, students being motivated to achieve, and less time-consuming grading activities for

instructors. Future research needs to investigate the efficacy of specifications grading and its impact on motivation, student achievement, and overall grading rigor.

References

- American Counseling Association. (2014). *ACA code of ethics*. Retrieved from <http://www.counseling.org/resources/aca-code-of-ethics.pdf>
- American Institutes for Research. (2006). *The literacy of America's college students*. Washington, DC: Author.
- Anderson, G. L., & Tredway, C. A. (2009). Transforming the nursing curriculum to promote critical thinking online. *Journal of Nursing Education* 48(2), 111-114. doi:10.3928/01484834-20090201-01
- Anderson, L. W. & Krathwohl, D. R. (2000). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Boston, MA: Allyn & Bacon.
- Babcock, P. (2010). Real costs from nominal grade inflation? New evidence from student course evaluations. *Economic Inquiry*, 48, 983-996. doi: 10.1111/ j.1465-7295.2009.00245.x
- Bennett, C., Kennedy, S., & Donato, A. S. (2011). Preparing NPs for primary care: Unraveling complexity with unfolding cases. *Journal of Nursing Education*, 50(6), 328-331. doi: 0.3928/01484834-20110228-05
- Boe, J. (2010). What the fl. *Writing on the Edge* 20(1), 5 – 7. Retrieved from <http://woe.ucdavis.edu/>
- Block, J. H. (1980). Promoting excellence through mastery learning. *Theory Into Practice*, 19(1), 66-74. doi: 10.1080/00405848009542874
- Bloom, B., & Associates. (1956). *Taxonomy of educational objectives*. New York, NY: David McKay.
- Brubaker, N. D. (2010). Negotiating authority by designing individualized grading contracts. *Journal of Self-Study of*

- Teacher Education Practices*, 6, 257 – 267. doi: 10.1080/17425964.2010.518667
- Chambers, D. W. (1999). Faculty ratings as part of a competency-based evaluation clinic grading system. *Evaluation and the Health Professions*, 22(1), 86-106. doi: 10.1177/01632789922034185
- Chun, M. (2010). Taking teaching to (performance) task: Linking pedagogical and assessment practices. *Change*, 42(2), 22-29. doi: 10.1080/00091381003590795
- Cobia, D. C., Carney, J. S., & Shannon, D. M. (2011). What do the students know and what can they do?. In G. J. McAuliffe & K. P. Eriksen (Eds.), *Handbook of counselor preparation: Constructivist, developmental, and experiential approaches* (pp. 367 – 376). Thousand Oaks, CA: Sage.
- Cooperman, R. (2011). Mastery learning in the adult classroom. *T+D* 65(6), 52-57. Retrieved from <https://www.td.org/Publications/Magazines/TD/TD-Archive/2011/06/Mastery-Learning-in-the-Adult-Classroom>
- Council for Accreditation for Counseling, Related Educational Programs. (2016). *CACREP accreditation standards and procedures manual*. Alexandria, VA: Author. Retrieved from <http://www.cacrep.org/wp-content/uploads/2015/05/2016-CACREP-Standards.pdf>
- Daugherty, K. (2006). Backward course design: Making the end the beginning. *American Journal of Pharmaceutical Education*, 70(6), 1-5. Retrieved from <http://www.ajpe.org/doi/pdf/10.5688/aj7006135>
- Davidovitch, N., Yavich, R., Keller, N. (2014). Mathematics and experiential learning-are they compatible. *Journal of College Teaching & Learning* 11, 135-138. Retrieved from www.cluteinstitute.com/ojs/index.php/TLC/article/view/8759/8734

- Dawson, M.E. (2005). Are they really learning what we're teaching? *Journal of College Science Teaching* 34(5): 32–33. Retrieved from <http://www.nsta.org>
- Diegelman-Parente, A. (2011). The use of mastery learning with competency-based grading in an organic chemistry course. *Journal of College Science Teaching*, 40(5), 50-58. Retrieved from <http://www.nsta.org>
- Fox, J. (2010). Establishing relevance. *The Teaching Professor* 24(5), 1. Retrieved from <http://www.facultyfocus.com/articles/effective-teaching-strategies/why-are-we-doing-this-establishing-relevance-to-enhance-student-learning/>
- Garver, K. 1998. A computerized approach to mastery learning. *Journal of College Science Teaching* 28 (2), 94–96. Retrieved from <http://search.proquest.com/docview/200351899?accountid=13505>
- Gordon, M. E., & Palmon, O. (2010). Spare the rigor, spoil the learning. *Academe*, 96(4), 25-27.
- Graff, N. (2011). An effective and agonizing way to learn: Backwards design and new teachers' preparation for planning curriculum. *Teacher Education Quarterly*, 38, 151-166. Retrieved from <http://files.eric.ed.gov/fulltext/EJ940642.pdf>
- Granello, D. H. (2002). Assessing the cognitive development in counseling students: Changes in epistemological assumptions. *Counselor Education & Supervision*, 41, 279-293. doi: 10.1002/j.1556-6978.2002.tb01291.x
- Granello, D. H. (2010). Cognitive complexity among practicing counselors: How thinking changes with experience. *Journal of Counseling & Development* 88, 92-100. doi: 10.1002/j.1556-6678.2010.tb00155.x
- Guskey, T. R. (1980). Mastery learning: Applying the theory. *Theory Into Practice*, 19(2), 104-111. Retrieved from <http://www.jstor.org/stable/1477165>

- Gusky, T. R. (2010). Lessons of mastery learning. *Educational Leadership*, 68(2), 52-57. Retrieved from <http://www.ascd.org/publications/educational-leadership/oct10/vol68/num02/Lessons-of-Mastery-Learning.aspx>
- Hiller, T. B. & Hietapelto, A. B. (2001). Contract grading: Encouraging commitment to the learning process through voice in the evaluation process. *Journal of Management* 25, 660-683. doi: 10.1177/ 105256290102500605
- Hoon, T. S., Chong, T. S., Ngah, N. A. B. (2010). Effect of an interactive courseware in learning matrices. *Educational Technology*, 13(1), 121-132. Retrieved from <http://www.ifets.info/>
- Kelting-Gibson, L. M. (2005). Comparison of curriculum development practices. *Educational Research Quarterly*, 29(1), 26-36. Retrieved from <http://files.eric.ed.gov/fulltext/EJ718116.pdf>
- Lamadi, B. T., Oyelekan, O. S., & Olurundare, A. S., (2015). Effects of mastery learning instructional strategy on senior school students' achievement in mole concept. *Electronic Journal of Science Education*, 19(5), 1-20. Retrieved from <http://ejse.southwestern.edu/article/view/14594/9806>
- Melton, K. I. (2008). Using modified mastery assignments to increase learning in business statistics. *Decision Sciences Journal of Innovative Education*, 6(2), 205-207.
- McAuliffe, G. J., & Eriksen, K. P., (Eds.). (2011). *Handbook of counselor preparation: Constructivist, developmental, and experiential approaches*. Thousand Oaks, CA: Sage.
- Nilson, L.B. (2015). *Specifications grading*. Sterling, VA: Stylus.
- Perera-Diltz, D. & Moe, J. (2014). Formative and summative assessment in online education. *Journal of Research in Innovative Teaching* 7(1), 130-142. Retrieved from <http://www.nu.edu/OurPrograms/ResearchCouncil/>

The-Journal-of-Research-in-Innovative-Teaching
.html

- Perry, W. G. (1999). *Forms of ethical and intellectual development in the college years: A scheme*. San Francisco, CA: Jossey-Bass.
- Polczynski, J. J., & Shirland, L. E. (1977). Expectancy theory and contract grading combined as an effective motivational force for college students. *Journal of Educational Research*, 40, 238-241. doi:10.1080/00220671.1977.10884996
- Reed, J. B. (1979). A competency based method for the marketing principles course. *Journal of Marketing Education*, 1(1), 45-51. doi: 10.1177/ 027347537900100109
- Richards, J. (2014). An old chestnut revisited: Teachers' opinions and attitudes toward grading within a competency based framework. *Journal of Training Research*, 12, 182-191. doi: 10.1080/ 14480220.2014.11082040
- Samson, G. E., Graue, M. E., Weinstein, T., Walberg, H. J. (1984). Academic and occupational performance: A quantitative synthesis. *American Educational Research Journal*, 21, 311 – 312. doi: 10.3102/ 00028312021002311
- Schnee, E. (2008). In a real world no one drops their standards for you: Academic rigor in a college worker education program. *Equity & Excellence in Education*, 41(1), 62-80. doi: 10.1080/10665680701764502
- Voorhees, R. A. (2001). Competency based learning models: A necessary future. *New Directions for Institutional Research*, 110, 5–13. doi: 10.1002/ir.7
- Wambugu, P. W. & Johnson, C. M. (2008). Effects of mastery learning approach on secondary students' physics achievement. *Eurasia Journal of Mathematics, Science & Technology Education*, 4, 293-302. Retrieved

from http://www.ejmste.com/v4n3/EURASIA_v4n3_Wagbugu.pdf

- Wiggins, G., & MaTighe, J. (2005). *Understanding by design* (2nd ed.) . Alexandria, VA: Association for Supervision and Curriculum Development.
- Wolcott, S. K., (2003). *Steps for better thinking rubric*. Retrieved from <http://www.gvsu.edu/cms3/assets/D653A93F-9F2D-583F-8CCB806937FE8384/Assessment/Assessment%20Rubrics.pdf>
- Wongsurawat, W. (2009). Does grade inflation affect the credibility of grades?. *Education Economics*, 17, 523-534. doi: 10.1080/09645290802470061