

Student and Program Assessment: Assessment Literacy, the Basis for Student Assessment

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Assessment is a crucial component of the teaching-learning process and national standards are creating the need for teachers who possess assessment literacy. Although possessing knowledge and skills for both student and program assessment are a requisite for effective teaching, the focus of this article is student assessment. Assessment literacy includes knowing how often to assess, what to assess, and how to prepare students to conduct the assessment. Therefore, family and consumer sciences teacher candidates need to exit their programs exhibiting assessment literacy. The first goal of this article is to examine selected assessment literacy expectations of four national entities. The other three goals are to review strategies for nurturing assessment literacy, propose an assessment literacy model, and examine supporting assessment competencies and standards from randomly selected states' Departments of Education. The need for assessment literacy was emphasized by Heritage (2007), who stated, "Teachers learn how to teach without learning much about how to assess" (p. 141).

Introduction

Teacher candidates' ability to assess student learning will have a profound impact on how well their students succeed. After reviewing a number of empirical studies, Black and Wiliam (1998) concluded that regularly conducted classroom assessment, when done using sound practices, had a positive outcome on student achievement and self-worth. They summarized their review by stating, "There is a body of firm evidence that formative assessment is an essential component of classroom work and that its development can raise standards of achievement" (p. 148).

Assessment for learning has been defined by Black, Harrison, Lee, Marshall, and Wiliam (2004) as "any assessment for which the first priority in its design and practice is to serve the purpose of promoting students' learning" (p. 10). According to Stiggins (2004) one-fourth to one-third of a teacher's time is used for assessment related-activities. Stiggins further noted that "teachers need to know and understand the principles of sound assessment" (p. 26). Further justification for teacher assessment literacy is that schools can use a combination of both state and local assessments to satisfy annual testing requirements of the No Child Left Behind Act (Olson, 2002).

During the 2005 National Association of Teacher Educators for Family and Consumer Sciences Teachers Education Conference, attendees created Expectation Statements for each of the ten *National Standards for Teachers of Family and Consumer Sciences* (National Association of Teacher Educators for Family and Consumer Sciences [NATEFACS], 2004). Recognizing the previously noted needs, four expectation statements were developed for Standard 9: Student and Program Assessment which states that beginning family and consumer sciences (FCS) teachers

should be able to “assess, evaluate, and improve student learning and programs in family and consumer sciences using appropriate criteria, standards, and processes” (NATEFACS). It is expected that pre-service teachers should be able to:

- Interpret criteria, standards, and processes used to evaluate student learning and programs in FCS.
- Integrate a variety of evaluation techniques (eg. authentic and performance assessments) to gather evidence regarding student learning and program performance.
- Justify decisions about teaching practices and program design based on data-driven evidence.
- Modify one’s teaching practices based on personal reflection and evidence from a variety of other sources.

A cohesive teacher education program will prepare teacher candidates to meet Standard 9 through development of assessment literacy. In addition to content area and pedagogy courses, knowledge and skills in cognitive psychology, including critical thinking and reflective judgment, will contribute.

Assessment Expectations

Expectations for assessment literacy from several sources are examined in the following segment of this paper. Assessment standards from the National Council for Accreditation of Teacher Education (NCATE) and the Association of Teacher Educators’ (ATE) *Background and Purpose Position Framework: ATE* (n.d.) were reviewed. The presence of assessment competencies in the American Association of Family and Consumer Sciences Certification Exam and Praxis I, II, and III were also examined.

Review of the *Professional Standards for the Accreditation of Schools, Colleges, and Departments of Education* published by NCATE (2006), revealed three competency levels described for each standard: unacceptable, acceptable, and target. One statement within Standard 1 which focuses on candidate knowledge, skills, and dispositions is related to assessment literacy in the preparation of teachers. To be considered at the acceptable level when assessing student learning, teacher candidates must “focus on student learning as shown in their assessment of student learning, use of assessments in instruction, and development of meaningful learning experiences for students based on their developmental levels and prior experience” (NCATE, p. 16). To attain the target level, teacher candidates must “accurately assess and analyze student learning, make appropriate adjustments to instruction, monitor student learning, and have a positive effect on learning for all students” (NCATE, p. 16). Assessment mechanisms teacher candidates are expected to use in data collection include case studies, work samples, and field and other experiences. Additionally they are expected to reflect on practice and act on feedback gained from the assessment process.

Because these standards are new Wise and Leibbrand (2000) asserted that states need to create meaningful professional development opportunities. King and Newmann (2000) and Heritage (2007) noted that if student achievement is to improve, in-service professional development is needed for teachers to enhance their knowledge, skills, and dispositions related to the standards.

Throughout the years, beginning in 1980, the ATE has developed an ATE Position Framework. The framework is based upon their mission statement, purposes, and corporate bylaws, and has come from the resolutions proposed by that committee. One of the components

of the mission is the development of quality programs that prepare teachers. An action item within the quality programs component is to “advocate for reliable, valid, and reasonable assessment requirements, instruments, and processes for pre-service and in-service teachers, as well as for p-12 students” (n.d., p. 4). In 1993 ATE passed a resolution that “...opposed the use of standardized exams as the sole or primary criteria for assessment of students at the p-12 and college levels” (*Background and purpose position framework: ATE*, n.d., p. 4). Additionally ATE supports the preparation of teachers in a strong and balanced manner that includes sound pedagogical practice throughout their professional lives. Therefore, if assessment is to be based on methods other than the use of standardized exams and teachers are to be grounded in sound pedagogical practice, teacher candidates need to be literate in assessment methods. Heritage (2007) noted that teacher educators have a crucial role to perform in equipping their students to integrate assessment into their classrooms.

Review of the two exams currently being used to assess family and consumer sciences teachers candidates’ competencies for pedagogy and subject content revealed little or no inclusion of assessment literacy concepts. One of these exams is the American Association of Family and Consumer Sciences’ (AAFCS) Certification Examination that was developed and validated in 2004. The Family and Consumer Sciences Composite Examination is comprised of questions related to Integration of Foundations and family and consumer sciences content. The only two assessment-related competencies included are the ability to assess leadership and teamwork skills that contribute to effectiveness in family, work, and community settings and to use multiple viewpoints and perspectives to appraise instructional content and activities. This 150-item exam allots 5% or approximately eight of its questions to the Integration of Foundations component of the test.

The second exam is the PRAXIS II Family and Consumer Sciences test that is designated for prospective teachers of family and consumer sciences who teach from middle through senior high school students. Approximately 23 of the 120 questions on the exam are devoted to FCS education concepts. One of the three conceptual areas within this concept category is planning, implementation, and evaluation. That category is divided among seven categories, the final of which is using appropriate assessment techniques such as observation and quality checklists in laboratory settings. A mathematical breakdown suggests that at most one or two questions related to assessment literacy would be included on the exam (*The Praxis series: Family and consumer sciences, 0120*, 2005).

Murphy (2006) noted that standards for teacher certification are state specific and based upon each state’s understanding of what is most important in education. Assessment standards for teachers of family and consumer sciences vary from state-to-state as do the attitudes of FCS teacher educators and in-service FCS teachers regarding assessment literacy of teacher candidates. Yahnke and Love (1997) found a discrepancy between these two groups regarding the importance of assessment literacy in the survey they conducted to examine the critical teaching competencies needed by beginning family and consumer sciences teachers. The teacher educators, over half of whom had been teaching pre-service FCS teacher education for 16 to 30 years, ranked the competency, “The teacher uses a variety of assessment tools and strategies to evaluate the continuous intellectual, social, and physical development of the learner” (Yahnke & Love, p. 52) significantly higher than the teachers’ ranked it. It is possible that the in-service teachers ranked this competency lower because they did not feel literate in this area.

In one state the *Advancing Student Learning – Assessment Standard* stated, the FCS teacher “understands and uses a variety of assessment and evaluation strategies to assist learners

in their intellectual, social, and physical development” (*Standards for teachers of family and consumer sciences*, n.d., p. 7). Performance expectations for the teacher include refining the instructional process through use of varied methods of assessment and involving learners in self-assessment. The teacher is expected to know how to use varied methods to evaluate learner progress through use of data and to provide learners with methods for self-assessment. Methods to be used include but are not limited to tests, projects, observations, portfolios, and task evaluation. Dispositions include valuing appropriate assessment tools and methods and the importance of using self-assessment data in setting goals for lifelong learning.

Nurturing Assessment Literacy

The ability to assess one’s self and others requires critical thinking and reflective judgment. King and Kitchener (1994) when stating the difference between critical thinking and reflective judgment noted that critical thinking focuses on inductive or deductive logic, while reflective judgment focuses on assumptions about knowledge that relate to a problematic situation. Perkins (1987) described critical thinking as better thinking. Using this description, Bruning, Schraw, and Ronning (1999) interpreted critical thinking to mean “... that learning to think critically will improve our ability to gather, interpret, evaluate, and select information for the purpose of making informed choices” (p. 201). It requires critical thinking to know how to assess, when to assess, and how to prepare students to be assessed. Teacher educators who responded to a study conducted by Yahnke and Love (1997) that examined critical thinking competencies needed by beginning family and consumer sciences teachers, ranked a teacher’s ability to facilitate student development of critical thinking and problem solving higher than the teachers ranked this skill.

According to Angelo (1995) there is strong evidence that critical thinking skills do not result due to maturation and that it is challenging to teach and help university students develop these skills. Angelo emphasized that “...learners need regular practice in assessment to become self-monitoring and independent” (p. 6). Winn (2004) noted that teachers “... must instill in students a familiarity with – and even a love of – critical thinking” (p. 497).

Ennis (2000) defined critical thinking as “... reasonable and reflective thinking focused on deciding what to believe or do” (p. 1). Ideal critical thinkers were described as having a set of dispositions and abilities that can be applied as a set of goals when developing and assessing a critical thinking curriculum. Among the dispositions, Ennis stated that critical thinkers care about the truthfulness and rightness of their beliefs, honesty and clarity in the presentation of their positions, and the dignity and worth of each individual. Additionally, it was stated that critical thinkers have the ability to clarify, make decisions and derive conclusions based upon information, use suppositional thinking and integration, and “... do these things with dispatch, sensitivity, and rhetorical skill” (p. 2).

There are a variety of approaches that can be used to nurture critical thinking. Learning to think critically requires practice beyond preparing to take midterm and final exams. McKeachine, Pintrich, Lin, and Smith (1986) did a review of research literature on teaching and learning in the college classroom. Through their review they found three basic strategies that were used to stimulate students’ critical thinking. These strategies were class discussion, a direct approach to problem solving, and verbally expressing metacognitive strategies. Angelo stated that “...when linked closely to instruction, classroom assessment can be a powerful means of developing critical thinking” (p. 7).

Bruning et al. (1999) described using either embedded or stand-alone programs for guiding students in developing critical-thinking skills. Improving thinking skills within a specific content area such as family and consumer sciences is an example of an embedded program, while independently developing thinking skills is the emphasis of a stand-alone program. They noted that teachers need to use a variety of classroom activities to help students learn to "... identify position or idea, analyze competing views, weight competing evidence, and gather information" (p. 207). Among the activities mentioned were class discussions, journaling, and thinking-aloud exercises allowing students to explain the skill as they perform it. Varied types of practice are required to create learners who automatically use critical thinking skills.

According to King (1992), the core of the intellectual process includes thinking, reasoning, and judging. King noted that "...learning to think reflectively occurs within the context of an intellectual community" (p. 7). Family and consumer sciences teacher educators recognized this when they ranked being a reflective learner and actively seeking out opportunities for professional growth as the most important competency for beginning FCS teachers among the eleven surveyed by Yahnke and Love (1997). Teacher candidates use judgment when assessing their students. Therefore, how does one learn to become a reflective thinker and to make reflective judgments and how do teacher educators facilitate this process that we have agreed is important? A review of the Reflective Judgment Model (RJM) developed by King and Kitchener during 25 years of research provided information about how people learn to make judgments related to controversial or ill-structured issues (King & Kitchener, 2004). They defined controversial problems as those "... about which 'reasonable people reasonably disagree'" (King & Kitchener, p. 5).

The RJM model describes the development of reflective thinking that occurs from late adolescence through adulthood. The seven stage model is divided among three categories that are pre-reflective thinking, quasi-reflective thinking, and reflective thinking. Throughout the stages the learners progress from believing that a single correct answer exists for all questions to using reason and evidence to support their thinking and the development of well thought-out positions. King and Kitchener (2004) noted that brain development occurring in late adolescence and early adulthood appeared to affect the manifestation of abstract and reflective thinking. When validating the developmental sequence of reflective judgment the data suggested that "... reflective thinking evolves slowly and steadily, even among those engaged in postsecondary education" (King & Kitchener, p. 14). King and Kitchener indicated that data from cross-sectional studies offered evidence that "development in reflective thinking is associated with participation in educational programs" (p. 15). Bruning et al. (1999) stated in order for students to become reflective thinkers they have to be engaged in classroom discourse that is authentic, respects their viewpoints, and has continuity, and there is a partnership between the teacher and students.

Bruning et al. (1999) and King and Kitchener (1994) recommended a variety of strategies for creating a classroom atmosphere that nurtures the development of reflective judgment. These recommendations included coaching, scaffolding, modeling, guided practice, encouragement, and feedback. Activities to enhance reflective judgment might include classroom discussions on controversial issues; having a debate defending either norm-referenced or criterion-referenced assessment with preparation to support either side; writing a journal to practice reflective thinking while at practicum sites, participating in student organizations, and student teaching; and gathering, assessing, evaluating, and making interpretive judgments on data such as pre- and

post-test scores on a family and consumer science unit that has been taught. As teacher candidates' learn to think, reflect, and self-assess they are developing assessment literacy skills.

Assessment Literacy

As noted in the Executive Summary of *Tech Tally: Approaches to Assessing Technological Literacy*, Gamire and Pearson (2006) stated that the ability to assess included three components. These components were knowledge about assessment, critical thinking and reflective judgment skills, and capabilities in the use of content knowledge to solve practical problems. The Executive Summary stated that an individual's level of literacy could be determined by whether or not their knowledge about assessment was limited or extensive, their critical thinking skills were poorly or highly developed, and their content capabilities were low or high. Pickard (2007) stated, "The intersection of the cognitive process dimensions and the knowledge dimensions can facilitate instructional planning and assessment" (p. 50). These components of assessment literacy reinforce the expectations for teacher candidates as stated in FCS Standard 9 for which beginning teachers should be able to assess, evaluate, and improve student learning.

Curtz (2007) suggested that in order to assess others, one needs the ability to self-assess or self-reflect. Curtz also noted that one value of teaching self-assessment is mutuality in providing an environment in which everyone is judged and everyone judges. According to Angelo (1995), learners need regular and guided practice to develop self-assessment skills. This practice needs to occur routinely during each semester through collecting data on students' learning. Curtz stated that at several universities in the state of Washington students write self-assessment and teacher-assessment narratives. The faculty did this as well, and during faculty-student conferences these assessments were discussed making this a mutual process thus enhancing the students' assessment skills. Other self-assessment strategies include small-group or whole-class discussions, reflection logs, weekly self-evaluations, and self-assessment checklists and inventories (Angelo; Curtz).

Guiding teacher candidates in developing critical thinking and reflective judgment skills along with self-assessment abilities helps prepare them to develop assessment literacy skills and to assess their own students. Where, when, and from whom do they obtain their knowledge about assessment after they have acquired content knowledge and critical thinking skills and how are they expected to use this knowledge? Because one of the two foci of Family and Consumer Sciences Teacher Education Standard 9 is student assessment, it is expected students have acquired assessment literacy from their family and consumer sciences teacher educators. What should they be taught and how is their assessment literacy being evaluated in regard to the expectation statements related to Standard 9? They are expected to integrate a variety of evaluation techniques to gather evidence regarding student learning and be able to interpret the data to determine the level of competency their students have attained and whether or not there is a need to change teaching practices.

Obtaining an answer to the question of what teacher candidates should be taught to be considered literate in assessment is complex because expectations vary from state-to-state. In an attempt to answer that question, thirteen states, which have a total of 73 family and consumer sciences education programs, were randomly selected and the states' competencies related to assessment literacy and self-assessment were examined. These states' Department of Education Web sites provided the source of information. One state did not have any assessment competencies listed for teacher licensure.

Knowledge and skill in using multiple methods for measuring student growth and understanding and the ability to identify strategies for providing students with accurate, timely, and relevant feedback to guide their learning were competency expectations for nine states. Four of these state Web sites noted specifically the need for teachers to be able to explain student performance to parents.

Six of the thirteen states expect teachers to exhibit competence in recognizing and interpreting various types of assessment information for curriculum and instructional planning and to guide their decisions. This included the ability to modify lesson plans and adapt instruction to ensure students' success in learning. Three other states expect teachers to be able to design appropriate assessment plans for students and involve students in their self-assessment.

Specifically including competencies that addressed diversity and the teachers' skill in modifying assessments for students with various needs and exceptionalities was noted for three states. Aspects of diversity included social, cultural, and physical.

Assessment literacy for two states included more technical aspects than simply using multiple types of assessment measures. They expect their teachers to be able to identify the measurement concepts, characteristics, and uses of norm-referenced, criterion-referenced, and performance- and product-referenced assessments. Additionally, teachers are expected to recognize central concepts in assessment such as reliability, validity, and bias. The concepts included in this array of states' assessment competencies relate to but expand those specified in the Family and Consumer Sciences Education Standard 9. No specific state rubrics for evaluating these competencies were discovered. The majority of states indicated the use of the PRAXIS examination to assess the competency of teacher candidates.

How teacher candidates' assessment literacy is being evaluated will vary according to their teacher educators and their teacher education programs. In 1996 Loyd listed a variety of assessment instruments that family and consumer sciences teachers need to have skill in using. These measures included conventional tests and product, performance, and process assessments. More recently White and Loyd (2000) stated that the national standards will require new forms of assessment that will enable teachers to measure what students know and are able to do as the result of the process-oriented curriculum. They recommended using assessment measures that included portfolio assessments, exhibits, demonstrations, authentic assessments, and performance testing. Kucera and Perkins (2000) recommended the use of scenario assessment "... to measure students' ability to apply knowledge and skills in real-life situations that address the learning standards" (p. 233). The scenarios allow students to use knowledge and cognitive process dimensions described by Pickard (2007) that are related to the revisions of Bloom's Taxonomy (Anderson & Krathwohl, 2001). These measures modeled by teacher educators also are appropriate for teacher candidates.

Another means for teacher candidates to determine their level of assessment literacy is through self-assessment. Eleven of the thirteen states whose standards were reviewed included a specific statement related to self-assessment. Both in-service and teacher candidates are expected to critically examine, evaluate, and regularly reflect on their teaching practices. They are to do this through obtaining feedback from peers, administrators, students, and parents. As the outcome of the self-assessments, they are to create and follow professional development plans for lifetime learning. In the National Board for Professional Teaching Standards (NBPTS, 2000) *Career and Technical Education Standards*, it was noted that reflection on teaching practices is a hallmark of accomplished teachers and one of their responsibilities as professionals.

Assessment is central to creating a student-centered and performance-based learning environment. Pickard (2007) emphasized this when she noted that teaching is more effective when standards are aligned with instruction, and assessment creates the need to focus on instruction. She stated that the revised Bloom's Taxonomy is a tool that can be used to align instruction and assessment. Pickard concluded that "...family and consumer sciences professionals should become familiar with the new model used for designing, teaching, and assessing education to determine its application for their work" (p. 45). Bobbitt and Youatt (2000) emphasized that "teacher education is an essential partner in fostering change related to standards at the pre-service, in-service, and graduate study levels" (p. 257).

Assessment and accountability have become an increasingly necessary component in the array of expectations for all educators. According to Vail (2000), "Our credibility in the educational community is tied to our ability to assess meaningful learning within family and consumer sciences education" (p. 276). This means that we must prepare teachers who have assessment literacy and the ability to demonstrate these competencies to their students and parents, administrators, and their communities.

Recommendations

Developing assessment literacy requires knowledge about the numerous facets of assessment coupled with critical thinking and reflective judgment skills and content knowledge. There is a need to know the level of assessment literacy exhibited by pre-service and in-service teachers. The following are recommendations to enhance and measure assessment competencies.

1. Require more course work in cognitive psychology. Falk (2002) noted that pre-service teachers need to know how people learn.
2. Require a course or specific standards in curriculum that relate to assessment literacy.
3. Provide practice in creating and/or adapting effective assessment instruments and strategies.
4. Examine and report assessment concepts that are taught in family and consumer sciences education programs as well as the method of delivery.
5. Develop an instrument for assessing family and consumer sciences education students' assessment literacy.
6. Develop a rubric to assess teacher candidates' attainment level of the expectation statements related to Standard 9.
7. Implement new opportunities for educators' professional development to enhance their assessment literacy skills.

Summary and Conclusions

As expectations for educational accountability have increased at local, state, and national levels the need for educators to be assessment literate has been magnified. In recognition of this need, FCS teacher educators created four expectation statements related to Standard 9, which focus on student and program assessment, to be used as guidelines in teacher education programs.

NCATE and ATE assessment standards and expectations were reviewed. Teacher candidates were expected to have assessment skills utilizing case studies, work samples, and field experiences. Testing for teacher candidates' assessment literacy is done primarily through Praxis II or the Family and Consumer Sciences Composite Examination; each of which contains few or no assessment related questions based on a review of each test's Table of Specifications.

Several authors including Bruning et al. (1999) suggested the importance of critical thinking and reflective thought in gathering, analyzing, and using data when assessing student learning. The seven-stage Reflective Judgment Model (King & Kitchener, 2004) described the development of reflective thinking that can lead learners, including pre-service teachers, to think, reflect, and self-assess, all competencies needed in developing assessment literacy. The three components needed for an assessment literacy model noted by Gamire and Pearson (2006) were knowledge about assessment, critical thinking and reflective judgment, and content knowledge in the field.

The review of selected state assessment standards illustrated variety in evaluation techniques pre-service teachers are expected to integrate as they gather evidence regarding student learning. Those listed included the ability to interpret criteria, standards, and procedures. Another central theme in the thirteen states' standards is self-assessment and the ability to think critically and reflectively as a basis for lifelong professional development.

The *National Standards for Family and Consumer Sciences Education* are symbols of priorities, legitimacy, authority, commitment, and hope (Vail, 2000). Teacher educators who provide the tools for pre-service teachers to develop and practice assessment literacy will set the stage for influencing their success as teachers, the success of their students, and the future impact of the family and consumer sciences teacher education discipline.

Annotated References

Bruning, R. H., Schraw, G. J., & Ronning, R. R. (1999). *Cognitive psychology and instruction* (3rd ed.). Upper Saddle River, NJ: Merrill, an imprint of Prentice Hall.

Authors present theory and beliefs about cognition and strategies for fostering cognitive growth through problem solving and critical and reflective thinking. Discussions and applications of cognition in the classroom conclude the book.

Chamberlain, V., & Cummings, M. (2003). *Creative instructional methods for family and consumer sciences, nutrition and wellness*. New York: Glencoe/McGraw-Hill.

The authors explain how to write assessment plans that relate to the assessment process. A broad view of evaluation and assessment is presented along with a variety of current examples.

Curtz, T. (2007). *Teaching self-assessment*. Retrieved May 23, 2007, from <http://www.evergreen.edu/washcenter/resources/acl/el.html>.

Curtz explains the value of guiding students in the process of self-assessment and provides guidelines used at one university for doing so.

Davis, B. G. (1993). *Tools for teaching*. San Francisco, CA: Josey-Bass.

Davis provides classroom-tested strategies designed for improving teaching. Examples of formative techniques to assess student learning and self-assessment of one's own teaching are supplied.

Easton, L. B. (2007). Walking our talk about standards. *Phi Delta Kappan*, 88, 391-394.

Easton focuses on the use of rubrics co-developed with students, which help them analyze quality of work and themselves as learners while documenting mastery. Goal is to decrease testing as evidence of mastery.

- Ennis, R. H. (2000). *A super-streamlined conception of critical thinking*. Retrieved February 23, 2007, from <http://www.criticalthinking.net/SSConcCTApr3.html>
A list of dispositions and abilities for critical thinkers is presented as an outline by the author. A Web site is presented where more elaboration can be found.
- Elliott, D. E. (2005). *Teaching on target: Models, strategies and methods that work*. Thousand Oaks, CA: Corwin Press.
Author presents examples for student assessment and grading to include guidance in developing a personal philosophy, types of tests, traditional grading systems, authentic assessment, portfolio assessment grading with rubrics, and use of taxonomies to measure outcomes.
- Family and Consumer Sciences Educators: Texas Tech University, Iowa State University, University of Wisconsin-Stout, United States Department of Agriculture Cooperative State Research, Education and Extension Service Higher Education Challenge Grant Program. (2001). *Assessment strategies for family and consumer sciences food and nutrition national standards*. Lubbock, TX: Texas Tech University Curriculum Center.
Authors provide examples of performance based assessments including checklists for evaluating scenarios and rubrics, action-based learning research projects, and objective test banks for comprehensive standards. The standards addressed are food production and services, food sciences, dietetics and nutrition, and nutrition and wellness.
- Harmin, M. (1994). *Inspiring active learning*. Alexandria, VA: Association for Supervision and Curriculum Development.
Examples of strategies for putting more emphasis on learning and stimulating student thinking are presented. Methods to assess student progress are provided.
- Heritage, M. (2007). Formative assessments: What do teachers need to know and do? *Phi Delta Kappan*, 89, 140-145.
Heritage emphasizes the importance of formative assessment in the interaction between teaching and learning. The author includes its definition, elements, the four-basic knowledge categories, and the skills teachers need to implement this type of assessment.
- Hitch, E. J., & Youatt, J. P. (2002). *Communicating family and consumer sciences: A guidebook for professionals*. South Holland, IL: Goodheart-Wilcox Co.
Authors discuss an array of topics measuring learner outcomes and program evaluation. Included is information on using the family and consumer sciences standards frameworks for program planning and action-oriented learning strategies to teach critical thinking.
- Linn, R. L., Miller, M. D., & Gronlund, N. E. (2005). *Measurement and assessment in teaching* (9th ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.
This text provides extensive discussion and examples in three parts that include (a) the measurement and assessment process, (b) classroom tests and assessment instruments, and (c) selecting and using published tests. Standard criterion such as validity, reliability, and usability for formative and summative assessment instruments are presented.
- Lowe, V., & Howell, L. (1994). *How do we know they know?* Gainesville, FL: Home Economics Education Association.

Authors provide techniques for evaluating student mastery of competencies and assessment by students demonstrating the ability to use knowledge and skills in life settings. Innovative techniques are illustrated to increase student motivation.

McMillan, J. H. (2007). *Classroom assessment: Principles and practice for effective standards-based instruction* (4th ed.). Boston, MA: Pearson.

The role of assessment in teaching and learning presents targets and standards as first steps to determining essentials of high quality classroom assessments. Formative and product assessment is explained with examples illustrating objective, selected response, short answer, and essay items. Performance assessment for deep understanding and reasoning skills includes criteria for rubrics, portfolios, and grading and reporting student progress to various constituents including parents. Also included is a discussion on the scope of a teacher's professional role and responsibilities for student assessment.

Popham, W. J. (2005). *Classroom assessment: What teachers need to know* (5th ed.). New York: Pearson, Allyn and Bacon.

Author provides instruction on how to write different types of tests with variation in selected response test item construction. Suggestions are given on how to grade exams and how to develop case studies that apply content-specific information. Explanation of uses of test results to enhance student achievement is included.

Quina, J. (1989). *Effective secondary teaching: Going beyond the bell curve*. New York: Harper & Row.

Quina provides examples of instructional testing and evaluation including test development, use of domains, table of specifications, and objective item types including supply and completion.

Torres, V., & Baxter Margolda, M. (2004). Reconstructing Latino identity: The influence of cognitive development on the ethnic identity process of Latino students. *Journal of College Student Development*, 45(3), 333-347.

Authors explore development of cognition and reflective thinking as it relates to reconstructing ethnic identity. The concepts gained from this article can broaden approaches to self-assessment and the comprehension of student cognition.

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Components of the standards include areas of study, comprehensive standards, content standards, competencies, academic proficiencies, process questions, and scenarios. The process questions engage student thinking to include reasoning and reflection of specific contextual problems. Scenarios are authentic life and work situations presenting a problem to be solved by performance and demonstration.

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