Developing Valid and Reliable Scenario-Based Assessments

New York State Family and Consumer Sciences
1998–2002
Dear Colleagues:

For the last four years, members of our Center for Education, Employment and Community team at EDC have collaborated with Family and Consumer Sciences (FACS) teachers and administrators in New York State on the Goals 2000 project to bring scenario-based assessments to the field. What began as an innovative strategy to focus learning on standards, resulted in a state-wide initiative supported and owned by FACS teachers and administrators, and institutionalized within the state’s learning and assessment system.

We have appreciated the opportunity to work with New York State educators on this important and groundbreaking effort. It is a wonderful collaboration that brings research and practice together in ways that make a difference for young people. We hope that this report will stimulate ideas for everyone who has been involved in the FACS project and others around the country who care deeply about high quality, authentic assessments that tell us how our young people are achieving, and help to design curricula that matches student needs.

On behalf of the CEEC team working on this project, Clifton Chow, Kerean Grant, Rachel Kimboko, Mya Nelson, we thank the New York State FACS teachers for the opportunity to share this experience and congratulate them on their success.

Yours truly,

Joyce Malyn-Smith
Senior Project Director
Center for Education, Employment and Community
Education Development Center, Inc.
Dear Colleagues:

In 1998, the New York State Education Department (SED) awarded a Statewide Goals 2000 grant to the North Rose Wolcott CSD for the development of intermediate assessments in Home and Career Skills. These assessments were designed to measure student progress toward achieving the learning standards in Family and Consumer Sciences and Career Development and Occupational Studies. During the four years of the grant, scenarios and test questions were written by teachers, tried out on students, and scored by teachers. This report includes a summary of the activities carried out under the grant and information on lessons learned from this project. A sample scenario with questions and scoring guide is also included in this report.

Sincerely,

Marilyn Kucera, NYS FACS Specialist

Mary Oliver, NYS Assessment Advisor
DEVELOPING VALID AND RELIABLE SCENARIO-BASED ASSESSMENTS

New York State Family and Consumer Sciences
1998–2002

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This report traces the story of a group of New York State Family and Consumer Sciences (FACS) educators who examined scenario-based assessment that benchmarked the attainment of the New York State Learning Standards for FACS and the Career Development and Occupational Studies (CDOS). It describes the process of assessment development and provides a detailed glimpse of the rigor required to develop valid and reliable tests. It also chronicles the process by which a group of classroom teachers became a disciplined test development team. This project has demonstrated that with appropriate support, teachers can develop and implement strong and reliable assessments that stand up to the rigor required by test development experts.

The project's goals were as follows:

- Build the capacity of New York State FACS teachers to develop and implement valid and reliable scenario based assessments.
- Develop valid and reliable scenario-based assessments.
- Evaluate these assessments to determine whether they could be an appropriate assessment vehicle.

Project partners, roles, and contributions were as follows:

- New York State Office of Workforce Preparation and Continuing Education: responsible for overall project leadership, contributed content expertise, participated in the National FACS standards initiative, recruited a core group of FACS test item developers, and developed a state-wide network of FACS teachers and sites.
- New York State Office of State Assessment: responsible for all statewide testing and contributed expertise and support in developing and implementing statewide assessments.
- North Rose Wolcott School District: responsible for project administration and budget and contributed project coordination and content expertise.
- Education Development Center, Inc.: responsible for scenario assessment conceptualization and design and contributed project planning, initial training and assessment design/review, and validity/reliability analyses.
- New York State FACS teachers: developed scenarios, test questions and scoring guides and helped pretest questions and score student papers.

The Goals 2000 Statewide Family and Consumer Sciences Project was funded by the U.S. Office of Education.
Selecting Participants

In the spring of 1998, the project coordinator selected teachers from fifteen middle schools to participate in this project. Selection criteria included the breadth and depth of Home and Career Skills program activities, technology readiness, in-service network support capability, and administrative commitment to the initiative. In each participating school, the FACS teacher made a commitment to participate in training and write scenario assessments. These teachers came from schools that represented the geographic, cultural, and socioeconomic diversity of the state.

Content Validity Matrix

In order to ensure that assessment products reflected both the New York State Learning Standards and the content of the National FACS Standards, experienced FACS teachers developed a matrix that identified points of intersection between the two sets of expectations.

Developing Capacity

In 1998 the FACS teachers participated in summer institutes. They became acquainted with the concept of scenario-based assessment and they learned to write and edit scenarios. They identified content topics that reflected both their interests and lessons usually taught in their classrooms. They drafted work plans that identified goals and timelines for their assessment writing assignments.

In order to build their capacity as a “learning community,” the geographically separated team of teacher writers shared a “virtual workplace” called DocuShare. All participating educators and staff were trained at Wayne Finger-Lakes BOCES in the DocuShare system (a secure Internet site) and received staff development training at Ziff Davis in Rochester, New York. Teachers posted their scenario drafts in a series of electronic folders on

Lesson Learned:

It takes a team of people with different strengths to make an idea reality.

Lesson Learned:

Strong assessments require conscious focus on the standards.
Selecting Scenarios to Be Piloted as Assessments

The process of identifying which scenario assessments were to be pilot-tested took place over a four-month period in the fall of 1998. The 25 draft assessments were ranked according to how well they met the established criteria for validity and the extent to which they contained technically strong assessment questions and answers. For all the draft-scenario assessments, the State Education Department worked with experienced teachers to suggest specific and detailed changes to align the assessments more closely with the criteria.

Establishing Systemic Validity

Systemic validity provided the means of evaluating both the process by which the New York State FACS scenarios were developed and piloted and the extent to which their content reflected the standards as outlined in the standards matrix. Systemic validity takes into account the scope of the scenarios, their directness in measuring the cognitive skills in the standards and criteria used in scoring, and the extent to which the cognitive levels measured in the scenarios reflect the curriculum and teaching.

Choosing Assessments for the Validation Study

Using the principles and guidelines for evaluating systemic validity, EDC and the State Education Department identified 10 scenarios for inclusion in the validation study. These 10 scenarios were developed by teachers who also served as pretesters of scenarios, informing us about issues relating to both process and content validation. Additional considerations included the following: (1) each scenario represented a distinct FACS topical area; and (2) the 10 scenarios were pretested at regions throughout the state of New York.

General Validation Strategies

EDC performed a gap analysis on each of the 10 scenarios, evaluating the presence or absence of the appropriate FACS standard the scenario was designed to measure. Teachers who developed and pretested many of the scenarios included in this report participated in a focus group and a conference call. Their views fed directly into the process validation and supported the content validation. Where appropriate, EDC analyzed documents from the New York State Education Department to understand and validate the process by which the scenarios were developed and piloted.

For me, the biggest challenges that first year were developing an understanding that the whole scenario assessment process has great value, and realizing it is something that we can adopt and learn to do well.
Analyzing Systemic Validity

Analysis of the systemic validity of the New York State FACS scenario initiative looked at content validity and process validity. Content area validation refers to a direct evaluation of the presence of competencies and standards from the New York State FACS and National FACS in the scenario instruments. Process area validation refers to a direct assessment of the development of the scenarios and how these scenarios were piloted. An evaluation of 10 scenarios representing 10 distinct FACS topical areas found that the assessments had systemic validity:

- A majority (6 of 10) of the scenarios examined did not contain any gaps with respect to the standards matrix.
- A majority of the questions reflected the standards they were designed to measure. Most of the problems centered around the clarity of the questions.
- Evidence indicated that the scenarios were driven by the FACS curriculum.

Findings about the validity of the scenario development and administration procedures were summarized through focus group meetings and phone interviews. The results were as follows:

- All scenario developers followed the standards matrix as closely as possible, often returning to them to double-check that the standards were present in the scenarios.
- No evidence of sample bias was found in the gender composition of student test takers. All middle school grade levels were represented.
- The developers wanted to make a library of exemplars available to teachers. One such exemplary scenario was placed on the World Wide Web.

By the end of Year 1, the project had built a core group of teacher-writers who had developed a strong sense of ownership of both the scenario development process and the assessment products. With a reasonable comfort level based on the experimental work of Year 1, and with the continued support of participating pilot sites and teachers, the project partners embarked on Year 2 of the Goals 2000 Statewide FACS Project.
Year 2 focused on reliability testing, improving the scoring process; expanding professional development, and broadening the test sample to include more communities across the state of New York.

Year 2 began with a summer institute which provided additional training on writing scenarios. This institute expanded the number of writers and deepened the knowledge of first-round writers. They received in-depth instruction on methods for developing scenarios, accompanying questions, and scoring guides. A panel of previously trained peers critiqued the work of new team members. Increased technical assistance and in-service training helped writers make better use of the virtual workplace. This additional assistance helped expedite the work of the writers, editors, and project evaluators.

Lesson Learned:
Scenario assessments help deepen teachers’ understanding of what good instruction and assessment are and how they cannot be separated.

In November, writers continued developing additional scenarios and scoring guides. New York State Education Department personnel shared information about the ongoing work through in-service training sessions and solicited schools to serve as pre-test sites.

Selecting Participating Sites
In December the Assistant Commissioner, Office of Workforce Preparation and Continuing Education sent letters to schools inviting their participation in pretesting of the scenarios. Following New York State assessment procedures, pretest booklets and directions for administering the tests were mailed to 35 schools. More than 1,800 students were involved in the pretesting.

Lesson Learned:
Developing the Scoring Guide is one of the biggest challenges: How to write down in words exactly what is wanted as an answer . . . so other raters understand it.

At first we thought we would have to change the way we teach but we quickly learned that this is something we already do.
Scoring Process and Analysis

After the pretesting of scenarios, a team of raters assembled in March to score the assessment instruments. Two judges rated each scenario pretest instrument; procedures were established to ensure that inter-rater reliability analysis would not be compromised. For example, each rater had no knowledge of the other rater’s scores on the same scenario instrument. All scenarios were rated, and 10 were included for analysis.

EDC analyzed the ratings using standard statistical techniques for reliability assessment, with the following results:

- Demonstrated inter-rater reliability: 9 out of the 10 assessment forms demonstrated strong inter-rater reliability. In most cases, questions of inter-rater agreement arose from selected questions in each form.
- Demonstrated psychometric validity: Items on the whole measured the knowledge and skills they were designed to measure.

Implications for further study include the following:

- Gender differences: Girls consistently outperformed boys in the scenario assessments; in some cases, this difference was statistically significant at the 95 percent confidence level.
- Additional training: There is evidence that raters need additional training to improve reliability in scoring.

By this time, the national FACS community had become aware of the work of New York State in developing a formal scenario-based assessment built on the National FACS standards. Interest grew rapidly. New York State developed a booklet describing the work of the project and reported its progress during the national meeting of the Association for Career and Technical Education in December 1999. More than 200 individuals attended the session. Teachers began to use the New York State Education Department web site as a medium to share information.

Lesson Learned:

- With technical assistance and support, classroom teachers, drawing upon their rich experience and content expertise, can develop valid and reliable scenario-based assessments.
- Innovators have a responsibility to share what they have learned to promote continuous improvement in their field.

Lesson Learned:

With technical assistance and support, classroom teachers, drawing upon their rich experience and content expertise, can develop valid and reliable scenario-based assessments.
Development and Testing of Scenarios and Scoring Guides

Teachers and writers learned more about the importance of developing clear scoring guidelines. In August and September 2000, the teachers met and developed 20 new scenario assessments for pretesting. From the 20, the State Education Department chose 14 scenarios for pretesting, and subsequently selected 13 for analysis.

In December, materials were mailed to 44 schools. In January 2001, 3,300 students took the pretests.

Scoring Process and Analysis

After the pretesting of scenarios, a team of teacher-raters assembled in March 2001 to score the student work. The raters were given scoring protocols and guidelines developed by New York State staff. Two judges rated each student booklet; procedures were established to ensure that inter-rater reliability analysis would not be compromised. As in 2000, raters did not have knowledge of the other raters’ scores on the same scenario instrument. A total of 13 scenarios totaling 2,561 pretest answer sheets were scored.

An analysis team at EDC evaluated the process by which the New York FACS scenarios were administered to examine whether there might be procedural bias that would threaten process validity. They did this by assessing the degree to which the testing environment was similar across sites. The team also examined how closely testing instructions were followed and whether there were disruptions or excessive noise (environmental problems) during testing.

There was no evidence that the testing procedure, as measured by the difficulties instructors and students had in following testing instructions, violated the procedural validity of the assessment. The EDC team concluded that the 2,561 pretest answer sheets included in this analysis met the most rigorous standards of procedural validity.

The EDC team completed an item analysis of 13 scenario assessments administered in January 2001 and found that all 13 met the most rigorous standards of psychometric analysis. They recommended keeping 11 forms, with little or no revision, as an exemplary bank of scenario assessments. On the whole, these 13 instruments indicated...
that the items function very well in discriminating the knowledge level of students and in presenting them with sufficiently challenging exercises. These 13 forms also demonstrated high levels of inter-rater reliability.

Significant differences in the performance of boys and girls were found. In 2000 this difference was attributed in some instances to inter-rater disagreement. The analysis team suggested controlling for inter-rater agreement and further exploring this result. In 2002, New York State controlled not only for inter-rater agreement, but also for differences among schools in rural, urban, and suburban settings; yet the difference remained. Therefore the analysis team concluded that the differences in the performance of boys and girls were genuine and not the function of random statistical sampling.
Institutionalizing the Assessment Process and Product Within the New York State Education Department

FACS tests were not new to the New York State Department Education. The department had previously produced tests aimed at ensuring minimum proficiency in the FACS skills at the secondary level. Thus, many of the New York State FACS teachers had already participated in previous state-led assessment activities and were comfortable and familiar with the process and products.

Lesson Learned:

Without state education department support, a state level test cannot exist.

In New York as in other states, within a state department of education, test initiatives move ahead in a variety of ways. Development of a new test or revision of an old exam is usually initiated by specific fiat of the Board of Regents and filters down through all levels of the bureaucracy. In this case, several factors led to the institutionalization of the scenario-based assessments for FACS.

• Scenario-based assessment was a new approach that was of interest to the New York Office of State Assessment.

• The product developed thus far by the Goals 2000 project was credible.

• Although development of the scenario assessment product would be labor intensive, a core of teachers participating in the test development process was prepared to use this new format because they felt it was worthwhile.

• Because the FACS assessment was driven by state content standards, moving forward with an official effort would continue to encourage schools to pay more attention to learning standards.

During Year 4 the Home and Careers Skills scenario assessments were folded into the ongoing state test-development program. The Office of State Assessment conducted the sample selection; analysis of data, and the editing, duplication, and mailing of test materials. State procedures and protocols were followed for assembling pretest and field-test forms, editing and reviewing items, keyboarding in a standard format, duplicating and shipping the pretest and field test forms in a secure fashion to participating schools, developing auxiliary materials such as answer documents and directions for administering the test, and arranging for the scoring of nonobjective (subjective) questions such as those accompanying the scenario assessment.

Once the assessments were administered and returned to the New York State Education Department Office of State Assessment, they prepared for the...
scoring sessions. Experienced raters who had been involved in Goals 2000 from the beginning and who had been through the previous two scoring session were hired as table leaders. FACS teachers were hired as scorers. The table leaders received two days of training using specific scenarios as prototypes and were assigned to oversee the scoring of three or four scenarios. Experienced raters who had been involved in Goals 2000 from the beginning and who had been through the previous two scoring session were hired as table leaders. FACS teachers were hired as scorers. The table leaders received two days of training using specific scenarios as prototypes and were assigned to oversee the scoring of three or four scenarios.

Lesson Learned:

To maintain a supply of new items, a continuous effort must be made to recruit and train new writers.

At the scoring sessions each table leader guided six to eight scorers through the scoring process. Table leaders resolved scoring difficulties, answered questions, and helped resolve differences in the interpretation of the scoring guide. They randomly “back-scored” tests (scored them a second time) to double-check the results of the scoring at their table. They ensured that all papers were scored and recorded according to the protocols set up by the Office of State Assessment for scoring subjective (nonobjective) test items in all content areas. After the scoring session, table leaders were responsible for revising the scoring guide when they found it to be deficient or incomplete.

Expanding the Pool of Test Writers

During Year 4, the project conducted two new training sessions, expanding the pool of item writers by 40. The sessions focused on prototype scenarios (“The Jeans that Failed Me,” “The Project Box,” “Marco Volunteering”) that had been through field testing analysis, editing and re-editing in Year 2. Training sessions were held in November for 20 teachers and in January for another 20.

Teachers were recruited through regional FACS meetings and through the state professional association. Interested teachers were invited to the item writer training sessions. Potential writers came from various parts of state. All participants clearly understood that they were being trained to write test questions and that they would be assigned items by standard and topic. Each participant made a one year commitment to this process. If their work showed promise and they were interested in continuing as test item writers, some of them would be invited to write more questions, serve on examination committees, review test papers, or become raters.

Ensuring Professional Development for Teachers Through Web-Based Tutorials

FACS teachers involved in this project voiced concern that in order to be familiar and comfortable with using scenarios for both instruction and assessment, teachers would need ongoing professional development and support. The New York State Office of Workforce Preparation and Continuing Education produced an online tutorial for this purpose, through the Goals 2000 project in cooperation with the Project Accelerate Consortium. The tutorial, “Scenario Assessment for Home and Career Skills,” is designed to assist...
intermediate-level teachers by doing the following:

- Reviewing the Intermediate-Level New York State Learning Standards for Family and Consumer Sciences and Career Development and Occupational Studies
- Reviewing the National Standards for Family and Consumer Sciences Education
- Showing the content that should be assessed in the mandated Home and Career Skills program
- Providing guidelines for developing scenario assessments

FACS educators involved in a project focus group reviewed prototype of the tutorial and made revisions. The tutorial will be reviewed again by the FACS state in-service teams. Teachers can access the tutorial through Accelerate U, a Web-based instructional resource center that offers online professional development focusing on New York State Learning Standards to educators, students, and the community in New York State. More than 19 BOCESs, several city schools, and seven partners, such as public television station WXXI, participate in Project Accelerate. This “one-stop” comprehensive New York State K-12 instructional support Web site contains original content, links to Web resources, and news from educators in the field.

The state organization of Family and Consumer Science Educators (FACSE) is publicizing the tutorial, encouraging its membership to view it on the Web site. The free tutorial is available 24 hours a day. FACSE is also using the tutorial to train teachers on this topic. Educators can view the video teaching clips at their leisure.

Lesson Learned:

There is a need to inform FACS professionals of the importance of assessing the state learning standards and to guide them in carrying out effective assessments using standards-driven scenarios.
Sample Scenario:

“The Jeans That Failed Me”
Michelle is a teenager who feels she is old enough to manage the money she earns from her babysitting jobs. Her parents are unsure about this.

1. Identify two ways Michelle could prove to her parents that she can effectively manage her money. *(1 point each for a total of 2 points)*

A. __________________________________________
   __________________________________________

B. __________________________________________
   __________________________________________

After several months of effectively managing her own money, Michelle decides she wants to buy a pair of jeans. She is trying to decide whether to buy a pair of designer jeans which are very expensive, or a pair of non-designer jeans which cost much less.

2. State two reasons why buying a pair of designer jeans might appeal to a teenager. *(1 point each for a total of 2 points)*

A. __________________________________________
   __________________________________________

B. __________________________________________
   __________________________________________
After thinking about which type of jeans to buy, Michelle decided to purchase the designer jeans.

3. List two consumer actions Michelle should take in order to make a wise purchase of the designer jeans.  *(1 point each for a total of 2 points)*

   A. 

   B. 

Michelle purchased the designer jeans at a local department store. She laundered them according to the care instructions but the jeans shrank and no longer fit. Michelle decides to return the jeans and goes to the department store where she bought them.

4. List two steps Michelle needs to follow with the sales clerk once she arrives at the store in order to have a successful return. *(1 point each for a total of 2 points)*

   A. 

   B. 
The sales clerk refuses to take the jeans back. Michelle feels the clerk is being unfair. Michelle decides to pursue the matter further.

5. State an action Michelle could take and explain how the action could lead to a successful return. (2 points)
“The Jeans That Failed Me”

Scenario Scoring Guide
Scoring Guide

“The Jeans That Failed Me”

1
Award one point for each answer that identifies how Michelle could prove to her parents that she can effectively manage her money.

Examples of one-point answers include but are not limited to:
- develop a money management plan with needs and wants
- prepare a budget and keep track of expenses
- open a savings account and only take out money when she really needs it

Award zero points for each answer that is completely incorrect, irrelevant or incoherent.

[1 POINT EACH FOR A TOTAL OF 2 POINTS]

2
Award one point for each answer that states a reason why buying a pair of designer jeans might appeal to a teenager.

Examples of one-point answers include but are not limited to:
- influence of advertising
- peer pressure
- to help meet ego needs
- designer jeans might be of higher quality
- may have better choice of styles/colors

Award zero points for each answer that is completely incorrect, irrelevant or incoherent.

[1 POINT EACH FOR A TOTAL OF 2 POINTS]
Scoring Guide

Award **one point** for each answer that lists a consumer action Michelle should take in order to make a wise purchase of the designer jeans.

*Examples of one-point answers include but are not limited to:*
- compare prices from store to store
- look for sales
- look for quality construction
- compare brands of designer jeans
- try the jeans on in the store to check for proper fit

Award **zero points** for each answer that is completely incorrect, irrelevant or incoherent.

**[1 POINT EACH FOR A TOTAL OF 2 POINTS]**

Award **one point** for each answer that lists a step Michelle should follow with the sales clerk.

*Examples of one-point answers include but are not limited to:*
- approach the clerk in a polite manner
- explain to the clerk the reason for the return
- make sure she brings what she needs (i.e., sales receipt, hang tag)
- inform the clerk what she prefers (to get another pair; refund; credit; or whatever else store policy allows)

Award **zero points** for each answer that is completely incorrect, irrelevant or incoherent.

**[1 POINT EACH FOR A TOTAL OF 2 POINTS]**
Award **two points** for an answer that states an action and describes how it could lead to a successful return.

*Examples of two-point answers include but are not limited to:*

  - Explain her situation to the sales manager. He/she has the authority to override the clerk's refusal and approve the return.
  - Contact the manufacturer. The manufacturer has an interest in seeing that consumers are pleased with their purchases.

Award **one point** for an answer that states an action but does not describe how it could lead to a successful return.

*Examples of one-point answers include but are not limited to:*

  - Talk to the sales manager.
  - Contact the manufacturer.

Award **zero points** for an answer that is completely incorrect, irrelevant or incoherent.

**[TOTAL OF 2 POINTS]**
Excerpts from the Content Topic Matrix for Home and Career Skills Scenario Development
## Excerpts from the Content Topic Matrix for Home and Career Skills Scenario Development

### Home and Career Skills

**Mod 3—Personal and Family Resource Management**

**Topic 1: How Can I Be A Responsible Consumer?**

Performance Objective: Identify various influences on student’s individual or family role as a consumer.

- Distinguish between the influence of different individual and family priorities, needs, wants, values, and lifestyles on consumer decisions
- Identify and describe the influence advertising has on consumer decisionmaking
- Analyze the influence that peers have on consumer decisions at different stages of the life cycle
- Determine the influence that availability of the resources of time, effort, money, and skills have upon consumer decisions

### NYS FACS Standards

**Standard 3—Resource Management**

Students will understand and be able to manage their personal and community resources.

**Intermediate Level Family & Consumer Sciences Key Idea 1**

Students will understand and be able to manage personal resources of talent, time, energy, and money to make effective decisions in order to balance their obligations to work, family, and self. They will nurture and support positive relationships in their homes, workplaces, and communities. They will develop and use their abilities to contribute to society through pursuit of a career and commitment to long-range planning for their personal, professional and academic futures. They will know and access community resources.

**Performance Indicators**

- Understand how the family can provide for the economic, physical, and emotional needs of its members
- Understand the resources available, make informed decisions about the use of those resources and know some ways to expand resources
- Understand how working contributes to a quality living environment

### NYS CDOS Standards

**Standard 3a—Universal Foundation Skills**

Students will demonstrate mastery of the foundation skills and competencies essential for success in the workplace.

**Key Ideas and Intermediate Level Performance Indicators**

- **Basic Skills** include the abilities to read, write, listen, speak and perform arithmetical and mathematical functions.
- **Thinking Skills** lead to problem solving, experimenting, and focused observation and allow the application of knowledge to new and unfamiliar situations.
- **Personal Skills** generally include the qualities of competence in self-management and abilities to plan, organize, and take independent action.
- **Interpersonal Skills** are positive qualities that lead to teamwork and cooperation in large and small groups in family, social, and work situations.
- **Technology** is the process and product of human skill and ingenuity in designing and creating things from available resources to satisfy personal and societal needs and wants.

*continued at right*
The chart below is an excerpt from a larger document prepared by the New York State Education Department. The knowledge gained by students using The Jeans That Failed Me scenario is compared with three sets of relevant standards: the New York State Family and Consumer Sciences (NYS FACS) Standards, the New York State Career Development and Occupational Studies (NYS CDOS) Standards, and the FACS National Standards. The complete matrix is available online in PDF format at the website: <http://www.emsc.nysed.gov/workforce/FACSE2/facse.html>.

- Consider technology in terms of its relation to a product or service and its impact upon consumer decisions
- Consider environmental and social issues that infringe upon the rights of others in the context of consumer decisions

<table>
<thead>
<tr>
<th>NYS CDOS Standards (continued)</th>
<th>FACS National Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information management focuses on the abilities to access and use information obtained from other people, community resources, and computer networks.</td>
<td><strong>Content Standard 2.2</strong> Analyze the relationship of the environment to family and consumer resources.</td>
</tr>
<tr>
<td>Resources management includes the application of financial and human factors, and the elements of time and materials to successfully carry out a planned activity.</td>
<td><strong>Content Competencies</strong> Examine environmental trends and issues affecting families and future generations.</td>
</tr>
<tr>
<td>Systems skills include the understanding of, and ability to work within, natural and constructed systems.</td>
<td></td>
</tr>
</tbody>
</table>