1998

Assessing Higher-Level Thinking Skills, Federation Schools of Accountancy Accounting Pedagogical Resource Series

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Accounting Pedagogical Resource Series

ASSESSING
HIGHER-LEVEL THINKING

1998-1

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Edited by

Billie Cunningham
The mission of the Federation of Schools of Accountancy (FSA) is to encourage, promote, assist, and support the development of high quality accredited programs of education for the accounting profession that lead to a master's degree. One of the strategies for accomplishing this mission is to assist member schools in dealing with curricular matters and with faculty development.

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Thomas P. Howard
1998 FSA President
A CATALOG OF RESOURCE MATERIALS
FOR ASSESSING STUDENTS' HIGHER-LEVEL
THINKING SKILLS

Authors:
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Prepared for
THE PEDAGOGICAL RESOURCES COMMITTEE
of the
FEDERATION OF SCHOOLS OF ACCOUNTANCY
1998
INTRODUCTION

What this series is about: This resource catalog is one of a series prepared for the Pedagogical Resources Committee of the Federation of Schools of Accountancy. The aim of the resource catalog series is to provide background information for instructors interested in enhancing classroom pedagogy. Each resource catalog focuses on a single pedagogical issue or approach. The catalogs are authored by educators who are familiar with the issue or approach in both their classroom efforts and research writings.

Organization of the resource catalog: Each catalog in the series begins with a topical overview, followed by a brief annotated bibliography covering some key articles the authors think would be of particular interest to educators. The remainder of the catalog is devoted to descriptions of particular resources available to educators. These resources are grouped into categories including: bibliographies, books, cases, classroom exercises, conferences, journals, newsletters, organizations, software, and videos. Each resource description includes a brief synopsis and information on how to obtain the resource.

Titles available in the series: The following resource catalogs, available through the Federation of Schools of Accountancy, have been published as of this writing:

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Editor: Karen Pincus, University of Southern California

A CATALOG OF RESOURCE MATERIALS FOR TEACHING ACCOUNTING STUDENTS CRITICAL THINKING (1995)
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A CATALOG OF RESOURCE MATERIALS FOR HELPING ACCOUNTING STUDENTS DEVELOP ETHICAL BEHAVIOR (1996)
Authors: Barney Cargile, University of Alabama; John Engstrom, Northern Illinois University; Cynthia Jeffrey, Iowa State University; David Lavin, Florida International University
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A CATALOG OF RESOURCE MATERIALS FOR HELPING ACCOUNTING FACULTY DEVELOP TESTING SKILLS (1996)
Authors: Tom Edmonds, University of Alabama at Birmingham; Philip Olds, Virginia Commonwealth University; Sue Ravenscroft, Eastern Michigan University; Douglas Rusth, University of Houston at Clear Lake
Editor: Billie Cunningham, University of Missouri-Columbia

A CATALOG OF RESOURCE MATERIALS FOR USING TEAMS IN TEACHING ACCOUNTING (1998)
Authors: Sue Ravenscroft, Eastern Michigan University; Robert Cluskey, Bradley University; Norma Holter, Towson State University; Pam Smith, Northern Illinois University
Editor: Billie Cunningham, University of Missouri-Columbia

A CATALOG OF RESOURCE MATERIALS FOR ASSESSING STUDENTS' HIGHER LEVEL THINKING (1998)
Authors: Carol Lynn Johnson, California Lutheran University; Charles P. Baril, James Madison University; Sakthi Mahenthiran, Butler University; Mostafa Sarhan, University of Akron; Gerald Weinstein, John Carroll University
Editor: Billie Cunningham, University of Missouri-Columbia
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OVERVIEW: 
ASSESSING STUDENTS' HIGHER-LEVEL THINKING SKILLS

One of the difficulties we incur, as educators, is choosing appropriate assessment methods for the assignments we develop for students. We have choices, not only of the assignments we give, but also the type of feedback we provide our students. This section of the FSA catalog is devoted to the exploration of assessing students' higher level thinking skills: critical thinking and moral reasoning. The following definitions for "critical thinking" and "moral reasoning" may be altered and expanded for the reader's purpose. The exact definitions are not at issue. They are provided as a starting point as we launch a discussion of assessing students in their ability to think at a higher level. We want to learn to better measure capabilities; thinking, reasoning and decision-making.

Critical Thinking: Critical thinking is a rational response to questions that cannot be answered definitively and for which all the relevant information may not be available. It is defined here as an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it that integrates all available information and that can therefore be convincingly justified.

Moral Reasoning: Part of the decision-making process which draws from innumerable variables present in culture, experience and ethics training. It is the application of one's own value-system and as such, influences choice among available alternatives.

With these definitions as a basis for understanding what is to be assessed, the challenge is to find how these higher-level thinking skills can best be evaluated. Further, the assessment methods chosen need to provide the student with feedback from which to develop skills for life-long learning. When assessing higher-level thinking skills, we go far beyond the concept of "a grade for an assignment within a course; a course grade for a transcript; a transcript for a degree." Because assessment of critical thinking and moral reasoning skills is dangerously close to judging personality traits, great care and considerable caution must be exercised in designing assessment schemes.

Many educators are familiar with Benjamin Bloom’s Taxonomy, developed in 1956 which classifies levels of intellectual behavior. Those levels of learning (in ascending order) are 1) knowledge, 2) comprehension, 3) application, 4) analysis, 5) synthesis, and 6) evaluation. While some may argue that "higher level thinking skills" may include the third level, "application," there is little controversy that the higher intellectual activities do include "analysis," and certainly "synthesis" and "evaluation" as described by Bloom. Assessment of students’ ability to appraise, compare, contrast, criticize, discriminate, question, test (analyze), or to arrange, compose, design, manage, plan, propose (synthesize), or to argue, assess, defend, judge, predict, support, value (evaluate) provides challenges not present in testing for rote (surface) learning. For that reason, and to provide some efficiency to those wishing to take on that challenge, this essay and
LEARNING AND ASSESSMENT

Assessment effects the way a student learns. When a student anticipates being tested or graded on the ability to reproduce information or to perform certain calculations, that is the level at which they will learn. To aspire to higher levels of learning, students must see value in moving beyond the rudimentary and place a premium on deeper understanding. Paul Ramsden [1992] refers to levels of learning as "deep and surface learning." These terms are used without prejudice for one form of learning over the other. Both deep and surface learning are necessary and have their place. However, each requires different methods of assessment in order to evaluate learning. The educator needs to be familiar with types of assessment and the appropriateness of each in given conditions. It is also imperative that the methods of assessment match the learning objectives of the assignments and/or the course.

Assessment can be described as "summative" or "formative." Summative assessment measures the ability of a student at a given point before then moving on to another topic. It is an evaluation of achievement at the end of a course or course of study. It serves as a summary of the degree to which a student has met objectives as they were originally set forth. Formative assessment comes in the form of feedback and is delivered throughout an assignment or course. The feedback is designed to give guidance as students move through the learning process. The feedback, ideally, is incorporated into the learning process. The objective of such feedback is a superior, refined outcome. Assessment schemes for any given assignment or course can be a mix of summative and formative assessment. The use of a strictly summative assessment design precludes the use of formative assessment. However, the use of formative assessment methods does not preclude summative methods to attribute to an assignment or course a "final" level of achievement. While summative assessment is usually structured and formal, formative evaluation can take many forms, and can be quite unstructured and informal. For example, a student "running an idea" by a teacher and eliciting an opinion can be considered formative feedback or assessment.

Assessment schemes for assignments and whole courses may include, in varying combinations and weights:

- Learner self-assessment
- Group self-assessment
- Peer assessment
- Teacher-of-group assessment
- Teacher-of-individual assessment

1 The most common form of assessment and often absent of any other method.
Where bibliographical citations treat any of these specific areas, it will be so noted. In addition, a sample of an assessment scheme using a combination of "group-on-group, peer and teacher-on-group assessment" is included in Appendix A.

THE USES OF ASSESSMENT

When planning a course, a written syllabus should reveal learning objectives. Those objectives become the basis for assignments or projects. In turn, those activities become the basis for assessment. The way a student approaches a course or an assignment will depend directly upon how the course outline design serves the goal of that student. What is important to the instructor or important within the institutional curriculum must become important to the student. As a result, care must be taken to achieve that goal congruence through assignment/assessment coordination. What students are able to do (and want to do) can be manipulated to some degree by how they are taught and graded. It takes care and attention to balance students’ need for achievement with the work they must do to meet educational goals. When assessing higher-level skills we face an added issue; balancing innate skills (even personality traits) and the mastery of learning objectives through study and achievement.

Teaching higher-level thinking skills requires stepped-up involvement by both student and educator. How students best learn is another topic, altogether. But what we need to address under the topic of assessment is the goal of each student: to earn a grade; to pass a course. Many students scan every syllabus to count the exams, the papers, the homework assignments and the perceived work load of the class. The weight of the individual course tasks helps the student determine the approximate time to be allotted to each. Knowing what we know about this “scanning” technique, assessment schemes must communicate to students the importance we feel for each of the course objectives. We need to move from the "Will it be on the test?" mentality. We need to use assessment as a tool which creates satisfaction from "knowing and understanding” and which moves the student away from the need to find "the right answer.” Eventually, they will need to feel challenged by chaos (in their careers), and not overwhelmed by unstructured assignments (in school).

Students are assessed, ultimately, as a record of how well they did and what can be expected of them in their careers. Assessment is used both as report and predictor. The message, as it pertains to higher-level thinking skills, is an opinion on the degree to which a student has been prepared for life-long learning. For that reason, the verbs we need to use to describe achievement must include cross-curriculum capabilities. Students must graduate with a measured ability to create, design, develop, formulate, manage, organize, plan, propose, select, judge, analyze, appraise, experiment, test, compare and contrast, conclude and recommend. Students should develop critical thinking and moral reasoning skills; coping tools regardless of any issues they are challenged to resolve.

Once students are employed, they face ongoing assessment. That assessment can come in the form of self-assessment, peer assessment, top-down employer assessment, bottom-up subordinate
assessment and/or any combination of the foregoing. On the job, such assessment is used as a
determinant of success and potential promotion. This evaluation often influences pay rates. As
educators, we serve students well to prepare them for career-related assessment. Job based
evaluation forms provide good models for assessment in course work. They are usually made
available upon request by local employers in the area.

To change how students learn, we must change how we assess.

MATCHING LEARNING OBJECTIVES, ASSIGNMENTS, ASSESSMENT

Cases

Cases (simulations) are heavily used in higher education as a teaching/learning tool. The main
objective for their use is to teach/practice higher-level thinking skills. As with other categories
of assessed coursework, problems arise when students take a limited (constrained) approach to
"finding the right answer" to the case. This approach takes the case out of the category of a
"simulation" and puts the teaching/learning tool back into the category of a word problem, for
which exists a correct answer and (importantly) a learned method or model by which to find it.
This (typical) student mindset defeats the purpose of the case approach, and the student slips
into the trap of trying to guess what the instructor is "looking for," and avoids a true exploration
of the experience described within the scenario.

The constraints imposed by students are, typically:

1. Time - due to other coursework commitments and procrastination
2. Thought processes - looking for "the right answer" (fitting the case into a known model)
and taking a singular approach (i.e., accounting or marketing or conflict resolution, etc.)
rather than a holistic view
3. Lack of incentive - for reasons known to the student, there is little reason to use the case
for its intended purpose
   a. low weight in the overall grade scheme for the course
   b. cost/benefit trade-off for doing the work involved
   c. dependency on the group to carry the workload (if a group assignment)

Appendix B contains a recommended student approach to a case assignment. The proposed
case approach is designed to overcome the obstacles listed and described. It is a two-pronged
approach. The system deals with both assessment issues and the process of completing the
simulation exercise. This approach can be used whether the case is assigned for individuals or
as a group endeavor. Appendix C contains an annotated bibliography of critical thinking cases
which lend themselves to this approach.
Setting Criteria for Assessment

It is recommended that students become a part of the assessment design process. A typical method which accomplishes this goal follows.

1. In a lecture session, begin the introduction to the exercise with a discussion of grades and assessment. Students should be taught something about assessment issues and are particularly interested when they feel that they have some ownership of the design of the grading criteria. This lecture/discussion session should lay the groundwork to help students see the case as a simulation of a life situation, similar to one they may face as consultants in the business environment. As discussion leader, refer to the subject of the case as the "client(s)" and to the characters by name. Continually refer to the assessment as the "compensation" for the consulting services. The students should be reminded that they are the experts.

2. Once the groundwork is laid, without yet distributing the case to the students, the class can be led into a discussion of assessment criteria.

Engage the students in a discussion of what should be considered in evaluating performance and earning a "fee." (One student should be taking notes from the board as the discussion develops so that a record is available from which to construct the assessment rubric that results from student input.) Students often begin with "typing the final report" and "making the overheads or handouts for the presentation." They are right that these can be given weight. This discussion needs to be guided, and students need to be reminded of the objectives of case studies as a teaching/learning tool. Assessment must be closely linked to those objectives. As the group recognizes this, the weighting for a summary grade begins to shift from the rudimentary tasks which support the process toward the thinking and communication skills involved in completing the consulting task.

Eventually, out of the discussion, a grading scheme will emerge which has been constructed by the students themselves. (This scheme is usually very close to, if not an improvement over a grading scheme which would have otherwise have been imposed.) As a result of the group effort, "ownership" of a resulting grade seems to tie in with a commitment to the case project.

Responsibility for Assessment

3. Once the grading criteria has been established, the next part of the discussion should cover the sources of the assessment for each item; self, group (if a group project) and instructor. Usually there is a clear authority for each of the assessment criterion. For example, the individual or group members can assess the features of the process. The instructor is not privy to that information. The "process" contains many learning objectives of the assignment. If assessable by more that a single "player," responsibility for the assessment criteria and corresponding weight can be shared.
4. From the discussion and the decisions regarding ultimate responsibility and weight, forms can be designed to embody the resulting assessment scheme. There should be one form for each assessing source. (If it is a group project, and the group is to assess itself, as a group, a rubric [form] should be designed specifically for that purpose.) These forms should provide a list of the criteria, the weight for each, and a brief reference to a range from "unacceptable" to "perfect." That brief reference would include summary characteristics within the breakdown within each range. Refer to Appendix A for sample assessment forms for a group case project.

It is helpful if the instructor's assessment criteria include the quality of the assessment done by individuals and/or groups.

5. It is further recommended that all grading criteria (including the instructor's) be published and included in the other case materials.

The description of the assessment package for a case assignment sounds complicated. In fact, it is initially a cumbersome task, but becomes easy with practice. A simple spreadsheet file can be used to design and track the grading scheme. Templates can be used and re-used as the grading criteria patterns emerge among groups, from term to term. After initial design and implementation, minor adjustments customize the rubric for subsequent assignments.

**Research Projects**

Incorporating research projects into class room assessments can be done at a various levels. While it is more widely used in seminars and case teaching approaches this method is also incorporated into basic courses with the objective of improving students' basic writing and communication skills. Research projects are an assessment technique that addresses two of the four important dimensions of student learning. These four dimensions are: (i) declarative learning (learning what), (ii) procedural learning (learning how), (iii) conditional learning (learning when and where), and (iv) reflective learning (learning why) [Angelo, 1991]. The two learning dimensions that research projects help are procedural and conditional learning. In procedural learning, students learn how to do things, the processes and procedures involved. Thus, research projects designed for general introductory courses help students improve their skills in thinking, speaking, and writing clearly. However, in addition, each discipline in a College or University will have its own particular skill set it wants to impart. For example, prospective accountants must learn to present and understand information in spreadsheets. The development of a mix of these general and specific skills is the target of most research projects.

The second dimension of learning in a research project assignment is to help improve conditional learning. This dimension is less often explicitly taught than procedural learning (Angelo, 1991). Conditional learning is learning good judgment in a particular field. According to Angelo "(It) is knowing when and where to use what you know to the greatest advantage." One example is
learning to write. Students who have not developed the judgment needed to decide whether to make a formal or informal tone are not yet good writers. Another example in accounting is accounting majors learning to make materiality judgments in auditing. The case-method and clinical instructions are the two teaching methods widely used in professional education programs to develop the conditional learning experience of students. While much has been written about the case method of teaching, this section and Appendix B draw heavily on an assessment criteria (and assessment rubric) for an equivalence of clinical instructional method in accounting, namely, the Cooperative Education Program that is in place at Butler University College of Business Administration.

Research papers can be evaluated along three broad groups, which can be loosely identified as (i) skill sets emphasized in a particular course or program, (ii) dimensions that must be present in a good research paper, and (iii) some general characteristics such as the use of visual material, presentations, and the substance of the research paper. In setting the assessment criteria to evaluate research papers and oral presentations, it is best to base it on the learning objectives and skills sets intended to be emphasized by the particular course or program. For example, the AASCB [1995] encourages a focus on the use of technology, ethics, and cultural diversity to be emphasized across the curriculum. Each College or University would have its own means of implementing these requirements. The areas chosen by the College of Business Administration at Butler University are shown in Exhibit 1.

For the second group, the dimensions that must be present in a good research paper can be divided into two areas: the content of the paper and the presentation of the material in the paper. The content area of the paper may consist of the following:

1. The Problem Statement: as soon as possible the problem statement or an opportunity for improving the decision must be clearly identified in the research paper. Preferably this should be accompanied by sufficient background information so that a reader gains an adequate understanding of the issues raised in the research project.

2. An Analysis of the Problem: it is often useful to begin with the significance of the issues in the research project. Then, a paper should proceed to describe the methods and tools used for analyzing the issues raised in the research paper.

3. Recommendations and Conclusions: any recommendation must logically follow from the analysis and must be well-specified. While an ideal and complete solution may not be possible, a research paper must, at minimum, describe the results one can expect to obtain if the recommendations in the paper are followed.

4. It may be good to ask a student to cite the research project's academic relevance. This would make students value their academic experience.
In addition to the above content areas of a research paper, it is best to develop assessment criteria for the presentation of the material in the paper. Four of the relevant dimensions to look for in assessing the presentations in a research paper are:

1. Structure and Organization: the more detailed information you provide to your students on how the research paper should be structured and organized, the greater
the consistency in students' research papers. Good paper structure greatly helps students organize their thoughts which consequently enables them to get across their ideas effectively.

2. The Writing Style: good attributes of formal writing should be encouraged. For example, the use of personal pronouns should be minimized. Before a research paper is assigned, details such as whether the paper should be double/single spaced and the font size that is acceptable should be made clear to students. If these details are omitted one can expect students to manipulate their writing styles to influence the grader's perceptions about the content of the paper. Students may believe that this can be done and that it works to their advantage.

3. Spelling and Grammar: spelling and grammar checking facilities have greatly helped in improving concerns in this area. However, questions about the use of proper spelling and grammar can still be a major issue. It is best to encourage students to use a manual such as "A Pocket Style Manual" by Diana Hacker. The more widely such practices are enforced in classes, the fewer problems a College would have in students' use of inappropriate grammar.

4. The provision of adequate support materials and visuals: these accompaniments to a research paper should be emphasized not only for clarifying the content of the research paper, but also for encouraging ethical and moral reasoning among students. The need for adequately referencing others' work is one such example.

In group three, for deciding on the assessment criteria for oral presentations, the factors considered under the content of a research paper should serve as a guideline. Additional criteria such as the appearance of the presenter and the use of hand-outs or visual aids should be emphasized. For an accounting major, a business-like appearance coupled with an assertive and helpful attitude can be a job clincher at an interview. These skills are best developed in formal presentations by requiring a student to present his or her research paper to an audience.

**Portfolios**

Portfolios (or journals) are student-generated writings which document the process of learning. These packages often become a graded assignment, assessed separately or in conjunction with the assignment or course to which they refer. If portfolios are used to document the process of completing a specific assignment, they are often a "daily diary" of the approach to the project. If used as a record of the work of an entire course, they become a major project which reflects a students growth and progress during the term. Portfolios are used as a form of student self-assessment. Each portfolio assignment must have requirements clearly stated. Each must also have the assessment criteria published and weighted as a guide to the preparer. This method of involving the student in documentation of the learning process is an "active learning" tool. Suggested assessment criteria include:
1. Frequent maintenance and review of the portfolio
2. Professionalism in the presentation of the portfolio
3. Demonstration of response to formative assessment
4. Thoroughness
5. Timeliness

For structuring assessment based upon a portfolio, a rubric model is useful and efficient. The student should be provided with a copy of the assessment model to facilitate completion of the portfolio at a standard of their own choice. (Refer to Appendix C for a discussion and demonstration of the construction of an assessment rubric.)

SUMMARY

This section of the catalog has been written and compiled to help educators solve assessment issues as they pertain to higher-level thinking skills. There is, in current literature, an abundance of information available, covering:

- Definitions and descriptions of higher-level thinking skills
- Appropriate assignments for specific course objectives
- Assessment methods
- Setting assessment criteria
- Managing assessment issues

In this overview, some of the topics with which we have had experience, are presented to assist others; to provide some shortcuts. We would like to think that our documented experiences result in colleagues not having to re-invent wheels that we have struggled to shape in our years of work. We have found samples of literature that have been useful to us and have provided a bibliography of some cases, a list of articles, and books.

An additional resource is the Internet. Discussion groups, newsgroups, papers and other current work is published on the "web" and can be found by using search strings that are specific to a research topic. As an example, a search for "deep and surface learning" (in Yahoo) yields lists of current work as well as references of previously published materials. Similarly, current material on specific assessment topics can be found. Website addresses are often listed in periodical articles. Those addresses are often linked to other related sites. Since there is so much available on the Internet, it would have been an overwhelming task to include a bibliographical listing of what is "out there." Many of the bibliographical references we have provided, books and articles, can be obtained through resources on the Internet.

SUMMARY OF MATERIALS PROVIDED

Appendix A contains a sample assessment scheme that is useful for case projects. Appendix B
contains a step-by-step approach to working a case. Appendix C contains an annotated bibliography of critical thinking cases. Appendix D contains a sample of an assessment method which helps produce consistency in grading. Appendix E provides an annotated bibliography of articles on various aspects of assessment. The resource catalog following the overview provides individual entries for books, along with descriptions and ordering information.

REFERENCES


APPENDIX A:
SAMPLE ASSESSMENT SCHEME

A sample assessment scheme is illustrated on the following pages. To understand the context of the design, the following assumptions must be communicated to the reader:

The assessment criteria and weights were negotiated by the students with the instructor.

The assignment point-value is 100, in total.

The students have assumed responsibility for 50 points.

The students have negotiated for the right to adjust the score of individual members, though, without that adjustment, each member of the group will receive the same grade for their contribution to the project. The maximum points that any member of the group can get from the group is 50. (The minimum is 0.)

The instructor is responsible for the remaining 50 points.

The assessment grids are distributed to the students with the assignment.

The assignment is a case (simulation).

The students have, at least, one week to complete the assignment.
### Case Study: Instructor-on-Group Assessment Sheet

(To be completed by the instructor. One assessment sheet will be completed for each group. The score from this assessment summary will be combined with the other element(s) of the assessment package for this case project.)

<table>
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<tr>
<th>Range of Values:</th>
<th>Very Professional to Above Average</th>
<th>Average Range</th>
<th>Below Average Range</th>
<th>Incomplete</th>
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<td>If out of 20</td>
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<td>18</td>
<td>16</td>
<td>15</td>
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<tr>
<td>or</td>
<td></td>
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<td>12</td>
<td>8</td>
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<tr>
<td>If out of 10</td>
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<tr>
<td>Group grade as assessed by Instructor</td>
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</table>

### Assessed Criteria:

#### Oral Presentation:
- Demonstration of familiarity with the case and the relevant issues therein
- Communication skills

(10 points possible)

#### Content:
- Appropriate analysis
- Logical conclusions

(10 points possible)

#### Group Dynamics
- Demonstration of teamwork
- Interdependence
- Mutual respect
- Enthusiasm

(10 points possible)

#### Portfolio:
- Diary properly maintained and complete
- Presentation and sequencing as required
- Quality of peer assessment

(20 points possible)

Out of a possible 50 points: Total: 

13
Case Study: Group-on-Group Assessment Sheet

(To be completed by the group and on the group, as a whole. One assessment sheet will be completed for each group. The score from this assessment summary will be combined with the other element[s] of the assessment package for this case project.)

<table>
<thead>
<tr>
<th>Description:</th>
<th>Superior</th>
<th>Excellent</th>
<th>Average Range</th>
<th>Below Average</th>
<th>Unacceptable</th>
<th>Assessed Grade per criteria</th>
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<tr>
<td>Range Values:</td>
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<tr>
<td>If out of 10 possible or 5 possible</td>
<td>10 or 5</td>
<td>9 or 4</td>
<td>8 or 3.8</td>
<td>7 or 2</td>
<td>5 or 1</td>
<td>2 or 0</td>
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<td>Assessed Criteria:</td>
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<tr>
<td>Individual participation by group members (10 points possible)</td>
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<tr>
<td>Teamwork (as evidenced by attendance and discussion at group meetings) (10 points possible)</td>
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<tr>
<td>Diary was maintained for all steps in the case analysis process (5 points possible)</td>
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<tr>
<td>Portfolio (10 points possible)</td>
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<tr>
<td>Presentation - written or oral (5 points possible)</td>
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<tr>
<td>Satisfaction with case assignment outcomes - overall (10 points possible)</td>
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<tr>
<td>Out of a possible 50 points - Total:</td>
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</table>
### Assessment Summary - Group Case Project

<table>
<thead>
<tr>
<th>Student name:</th>
<th>Instructor-on-Group</th>
<th>Group-on-Group</th>
<th>Adjustments (+ and/or -) for contribution as assessed by peers</th>
<th>Total score (per individual group member)</th>
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</thead>
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</table>

Features of this sample assessment scheme:

1. There was group-on-group assessment
2. The group had negotiated the authority to adjust individual members’ score
3. The instructor graded the product of the group assignment
4. Criteria and weights of each were known to the students while completing the assignment
APPENDIX B:
APPROACHING THE CASE PROJECT - A RECOMMENDED STEP-BY-STEP APPROACH TO WORKING A CASE

One of the weaknesses of an unstructured approach to a case project is that students do not see the importance of assimilation of the material over a period of time. The student-centered goal is to get the assignment completed with as little effort as possible. This is an impediment to the usefulness of cases as a learning tool. This "quickie" approach is the reason students grab their calculators and lapse into finding "an answer" based on some model for which they see enough data to apply. This is not the objective nor the approach we, as educators have in mind.

Each student (or group) should be required to maintain a "diary" on which to build a case portfolio. This portfolio should be available for review at least once during the term of the case assignment. (After the steps of Day 3, there is enough data to give helpful guidance for continuing the case project.) The deadline date for the interim review should be announced at the beginning of the case assignment. At the conclusion of the assignment, each student (or group) would submit the completed portfolio for assessment purposes. The completed portfolio contains the proper assessment form(s). If a group project, individual student assessment forms could be submitted separately to protect any confidentiality.

It is imperative that the students have at least a week to complete the case assignment. The following series of steps is recommended for finding "solutions" to cases:

Day 1:  Read the case.
         No notes or highlighting.

         At least an hour after the first reading:
         Read the case for a second time.
         Highlight interesting points ONLY.

Day 2:  Read the case for a third time.
        Look for goals, aims and objectives, only. Write them down as you find them.
        (Keep this tentative list for the diary and portfolio)

        Read the case for a fourth time.
        Now begin to make notes (for the diary and portfolio):
        Strengths? Weaknesses? Why certain points were found "interesting" from Day 1 reading.

1For time-management purposes, days 2, 3, 5, and 6 are the longest. Days 3, 5, and 6 may require outside research, depending upon the case.
If a conflict resolution case: make notes of areas of agreement and
disagreement and points of indifference or irrelevance.
Try to see issues from at least two perspectives and do not take sides
or draw conclusions.
It is in this session that some financial analysis may be helpful

Day 3:  
Read the case for the fifth time.
This reading is check that you have considered all relevant factors
within the case. It is helpful to make a list of these factors as you
re-read, without referring to previously generated lists. (Retain this list
for your diary and portfolio.)

Read the case for a sixth time.
Look for areas that could be affected by factors in the external
environment of the subject of the case.
List any external "threats" and/or "opportunities." Explain why
you found them to be so. (Retain these notes for the diary and
portfolio.)

Without reading the case again, begin to pull together lists and notes.

Day 4:  
From your lists and notes you should be able to see possibilities for
recommendations to emerge. Choose 3 alternatives. Make notes about each
alternative, explaining briefly why you see it as a viable alternative. (Retain these
notes for the diary and portfolio.)

Day 5:  
For each of the three alternatives listed, examine and note:
Short-term consequences or results from making that choice
Mid-term consequences or results, and
Long-term consequences or results.
(Retain these notes for your diary and portfolio.)

Read the case again, checking to see that all three alternatives make sense.

Day 6:  
From the three alternatives you have listed, choose the one you recommend.
For your recommended alternative, explain what steps need to be
taken, when they should be taken, and how they should be implemented.

Day 6 can be divided into more than one day for the word-processing, proof reading, design of
supporting documents. These tasks vary in duration, student to student and according to the
output requirements of the initial assignment.
Compile your written case study. (Include information from lists and notes as the case study was developed. Provide an explanation of alternatives explored. Explain the reasons why some alternatives have been rejected. Detail the chosen alternative, explaining why it is the superior choice. Include an implementation plan for the recommended action.)
Create any charts, graphs and illustrations. (Make overheads and handouts.)
Write a brief outline of an oral presentation, if it is required.
Complete your self-assessment, if it is required.
Complete your diary/portfolio.

Summary of this approach to cases

When reviewing cases for an assignment, notice that most come with questions. It is appropriate to simply remove the questions from the case prior to distribution to students. Specific questions may be supplied after the student has become familiar with the case. Most cases, however, lead the reader to points or issues within the simulation. The trap that is set by asking specific questions is avoidable. By deleting questions, students do not immediately narrow their approach to the case by calculating "the right answer" or by limiting their analysis to the issue posed. The questions are there to serve as prompts for analyzing a case. Too often those same questions are seen as the requirements of the assignment and the case analysis is then limited by the questions, not enhanced by them.

Teaching thinking is time-consuming. Taking this scheduled approach, students learn the value of assimilation of information over a period of time. It takes practice to see cases (simulations) from a holistic view.

If students are new to the use of cases in coursework, it may be helpful to give case assignments and ask for Days 1 through 3 or 4, only. Using the gradual introduction to case analysis impresses the student with the importance of considering all factors, of allowing an appropriate amount of time for each stage of case development, and (importantly) to look beyond the trap of "a right answer."
APPENDIX C:
SELECTED BIBLIOGRAPHY OF CRITICAL THINKING CASES IN ACCOUNTING LITERATURE

These cases were originally published in one of the three journals: Journal of Accounting Education, Issues in Accounting Education, and Accounting Educators' Journal. The presentation style is that each contains a scenario which provides students the opportunity to use critical thinking skills. Although many crossover into other areas of accounting, they have been classified on the basis of the course for which they are likely most suited.

ACCOUNTING INFORMATION SYSTEMS

Author(s): Christiensen, A., and M. Eining
Title: Software Piracy - Who Does It Impact?
Journal: Issues in Accounting Education
Pages: 151-159
Volume: 9.1
Year: 1994
Other use: Auditing
Annotation: Case deals with the cost, legal and ethical aspects of software piracy. Role playing is involved.

Author(s): Maurice I. Hirsch, Jr, and M. Bernstein
Title: The Repertory Theatre of St. Louis
Journal: Journal of Accounting Education
Pages: 153-182
Volume: 8.1
Year: 1990
Annotation: Presents a nontraditional set of information used in a non-profit organization, including revenue allocation issues. Student must devise a usable information system.

ADVANCED FINANCIAL

Author(s): Adhikari, Ajay
Title: Autotex, Inc.
Journal: Journal of Accounting Education
Pages: 211-225
Volume: 12.3
Year: 1994
Annotation: Deals with foreign currency translation. SFAS #52 criteria for determination of the functional currency are not definitive and leave room...
for judgment. The case points out the possibility of arriving at different decisions as a result of the flexibility permitted in the statement.

Author(s): Bushong, J.G., and D.W. Cornell
Title: The Case of the Small Business Client
Journal: Issues in Accounting Education
Pages: 181-190
Volume: 10.1
Year: 1995
Annotation: Student must write letter to client explaining the rationale for a usage of GAAP. Requires student to integrate knowledge of various technical courses and demonstrate communication skills.

Author(s): Cenker, William, and R. Bloom.
Title: The Valuation of an Accounting Practice and Goodwill
Journal: Journal of Accounting Education
Pages: 311-319
Volume: 8.2
Year: 1990
Annotation: Students must determine a value to assign to goodwill. Quality of analysis is the emphasis, with no single correct answer offered.

Author(s): Mills, Patti A.
Title: Milianaw University: An Instructional Case in Internal Control and Ethics
Journal: Issues in Accounting Education
Pages: 377-387
Volume: 10.2
Year: 1995
Annotation: Emphasizes the importance of internal control issues and ethical conduct in a non-profit environment.

Author(s): Ricci, Phillip, L.J. Hanouille, and G.A. Jarrell
Title: Valuing American Pharmaceuticals, Inc.
Journal: Issues in Accounting Education
Pages: 139-168
Volume: 8.1
Year: 1993
Annotation: Teamwork project which provides experience in solving unstructured problems, determining fair value of a business, and negotiating.

Author(s): Weinstein, G.P.
Title: The Concord Food Cooperative
Journal: Accounting Educators' Journal
AUDITING

Author(s): Albin, M.J.
Title: Pasco Construction Company
Journal: Journal of Accounting Education
Pages: 349-355
Volume: 10.2
Year: 1992
Other use: Controllership
Annotation: A small but rapidly growing retail business faces several important issues. Students see the CPA in a broader, consultant-type role.

Author(s): Arnold, Vicky, P. McKenzie, and S. Sutton.
Title: Arkansas Solar Heating Corporation
Journal: Issues in Accounting Education
Pages: 353-365
Volume: 9.2
Year: 1994
 Annotation: An auditor is forced to come to grips with ethical issues when he acquires a client which is owned by members of his family.

Author(s): Arnold, Vicky, P. McKenzie, and S. Sutton.
Title: Instructional Case: Rock Star Promotions, Inc.
Journal: Journal of Accounting Education
Pages: 241-257
Volume: 13.2
Year: 1995
Other use: Business Law
Annotation: Multifaceted case, one objective of which is to expose the student to the difficulties of applying GAAP in a real-world situation.

Author(s): Green, Brian, and T. Calderon.
Title: Using Real World Cases to Illustrate the Power of Analytical Procedures
Journal: Journal of Accounting Education
Pages: 245-268
Students use data from multiple real-world sources, exercise judgment, and evaluate risks.

Tidrick, Donald E.
"You’re in Charge"
Issues in Accounting Education
85-96
Volume: 6.1
Year: 1991
Annotation: Provides students with insights about auditing from the perspective of a fairly junior auditor. Illustrates technical, ethical, interpersonal, and administrative considerations.

COST/ MANAGERIAL

Anderson, James. A.
Sourcing Surfacants
Journal of Accounting Education
357-374
Volume: 10.2
Year: 1992
Annotation: Student must confront limited information, nonstandardized report formats, a short time frame, several decision perspectives, and quality concerns in deciding the best source for a key production input. Ethical and environmental considerations are also involved.

Main Line vs. Basinger: A Case in Relevant Costs and Incremental Analysis
Issues in Accounting Education
163-174
Volume: 11.1
Year: 1996
Annotation: Student must assess reliability and reasonableness of numbers used in computing lost profit. Alternative assumptions must be considered and the student is asked to prepare his/her own computation of lost profit.

Bloom, Robert, and J. Kantor
CBS News: Should Television Network News Divisions be Profit Centers?
Deals with distinction between a cost center and a profit center. No single “correct” answer.

Capettini, Robert, C.W. Chow, and J.E. Williamson
Title: The Proper Use of Feedback Information
Journal: Issues in Accounting Education
Pages: 37-56
Volume: 7.1
Year: 1992
Annotation: Actually two mini-cases, each dealing with aspects of bias in feedback information.

Chow, Chee, W.
Title: Vincent's Cappuccino Express - A Teaching Case to Help Students Master Basic Cost Terms and Concepts Through Interactive Learning
Journal: Issues in Accounting Education
Pages: 174-180
Volume: 10.1
Year: 1995
Annotation: Limited technical data provided; emphasis on fostering an interactive/intuitive learning experience through a very basic problem.

Chow, Chee W., Y. Hwang, and D.F. Togo.
Title: ACE Company: A Case for Incorporating Competitive Considerations into the Teaching of Capital Budgeting
Journal: Issues in Accounting Education
Pages: 389-401
Volume: 10.2
Year: 1995
Annotation: New product development is used to introduce a strategic dimension to capital budgeting. Students must look into factors including the cannibalization of existing products and the deterrence of competitors’ entry into the market.

Costigan, Michael, and M. Hirsch.
Title: Home Builders Association vs. St. Louis County Water Company A Cost Allocation Case
Journal: Journal of Accounting Education
Pages: 151-175
Students evaluate alternative cost allocation schemes in a regulated environment and make a resolution of the issues.

Haka, Susan F., B. Lamberton, and H. Sollenberger
Performance Evaluation: The Case of Ameripill Company
Issues in Accounting Education
Pages: 168-190
Volume: 9.1
Year: 1994
Annotation: Illustrates some of the complex issues involved in evaluating international subsidiary performance. Students are asked to evaluate and make specific recommendations.

Hartley, Ronald V.
Cost Prediction and Allocation: An Incident Process Case
Issues in Accounting Education
Pages: 141-151
Volume: 2.1
Year: 1987
Annotation: Helps students identify the right questions to ask in approaching and solving a problem.

Moon, Phillip
Competitive Tendering and under-Capacity: An Incident Process Case
Issues in Accounting Education
Pages: 445-452
Volume: 3.2
Year: 1988
Annotation: Students must determine whether additional information (available at a "cost" from the instructor) is valuable. No single correct answer.

Ruhl, Jack, and B. Hartman.
Linkages Between Organizational Goals, Strategies, and the Budget Process
Journal of Accounting Education
Pages: 227-244
Volume: 12.3
Year: 1994
Annotation: Integrates topics studied in management or organizational behavior courses (goals and strategies) with accounting issues (budgeting, feedback,
and variance analysis). Source of issues is a company experiencing rapid growth.

ETHICS

Author(s): Smith, Malcolm
Title: SLI Holdings: A Case Study in Accounting Ethics
Journal: Journal of Accounting Education
Pages: 99-110
Volume: 13.1
Year: 1995
Annotation: Requires the student to consider the ethical aspects of an individual's actions.

INTERMEDIATE

Author(s): Ahadiat, Nasrollah, and R.I. Brueggermann.
Title: Evaluating an Investment Proposal
Journal: Journal of Accounting Education
Pages: 299-310
Volume: 8.2
Year: 1990
Other use: Managerial
Annotation: Student must weigh a great deal of information in determining whether an investment should be made in a cable television franchise. Nonquantitative items must be evaluated. [Note: Solution not provided.]

Author(s): Busta, B., and P.D. Kimmel
Title: Exploring the Impact of Information on the Stock Market
Journal: Issues in Accounting Education
Pages: 378-390
Volume: 8.2
Year: 1993
Other use: Post-Intermediate
Annotation: This business game simulates the stock market allowing students to appreciate the uses and limitations of accounting information.

Author(s): Ferris, Kenneth
Title: Cannon Group, Inc.
Journal: Issues in Accounting Education
Pages: 179-192
Volume: 4.1
Year: 1989
Students must assess whether a set of financial disclosures are misleading.

Libby, Patricia A., and V. Bernard
The Yeager Tool Company
Issues in Accounting Education
335-357
8.2
1993
Students must consider interpretation of ratios in light of alternative accounting methods and objections to augmenting or replacing managers' judgments with statistical models.

Merchant, Kenneth A.
Bedlington Federal Savings
Issues in Accounting Education
359-374
4.2
1989
Students must discuss ethical issues in the context of the organization.

Miller, T.
Central Coast Savings
Issues in Accounting Education
358-377
8.2
1993
Advanced Financial
By studying a savings and loan acquisition that took place prior to SFAS No. 72, students see why prior GAAP did not accurately reflect economic events.

Whittred, Greg
Tully Pty Ltd
Issues in Accounting Education
160-167
9.1
1994
Controllership
Shows how a firm's operating and accounting decisions can interact. Students discover that proposed changes in accounting standards can affect loan covenants and thus lead to incentives to "manage" the accounting numbers.
Students must use limited information to reconstruct financial statements for a company about to go public and then infer the reason for a change from the completed contract method to the percentage of completion method.

**PRINCIPLES/INTRODUCTION TO FINANCIAL/INTRODUCTION TO MANAGERIAL**

**Author(s):** Anderson, James A.
**Title:** A Multifaceted Case for Varied Levels of Financial Accounting
**Journal:** Journal of Accounting Education
**Pages:** 301-307
**Volume:** 7.2
**Year:** 1989
**Other use:** Intermediate or Advanced Financial
**Annotation:** Student is presented with a balance sheet and some notes and must answer questions based on the available information. Instructor can select level of detail appropriate to the specific class.

**Author(s):** Carlson, Marvin L., J.W. Higgins, and V.L. Lewis.
**Title:** Introducing Accounting - A Comprehensive Case Approach
**Journal:** Journal of Accounting Education
**Pages:** 215-233
**Volume:** 10.1
**Year:** 1992
**Annotation:** Financial accounting is introduced to the student by downplaying the numerical analysis in favor of a participative, intuitive approach.

**Author(s):** Lovata, Linda M.
**Title:** Experiential Process Costing Project
**Journal:** Issues in Accounting Education
**Pages:** 148-152
**Volume:** 1.1
**Year:** 1986
**Annotation:** A hands-on classroom project which promotes student understanding of process costing.
Author(s): Sullivan, Edward, J.
Title: Teaching Financial Statement Analysis: A Cooperative Learning Approach
Journal: Journal of Accounting Education
Pages: 107-111
Volume: 14.1
Year: 1996
Annotation: Uses cooperative learning techniques to teach financial statement analysis and develop critical thinking skills through student team work.
APPENDIX D:
SAMPLE OF AN ASSESSMENT METHOD -- ASSESSMENT RUBRIC

The assessment rubric is designed to produce consistency in grading through clearly specifying characteristics associated with each of the five possible ratings. This rubric is being used at Butler University College of Business Administration to assess the students’ Cooperative Education training experiences. This experience is an integral part of the College of Business curriculum for all business majors. Research papers produced as a result of their work experience are evaluated for the following items which can be loosely thought of in three groups: four skills (creative problem solving and critical thinking, communications, information management, and collaboration), five of the dimensions for evaluating research papers (problem statement, analysis, academic relevance, contribution to employer, and conclusions and recommendations), and two general characteristics (substance of project, and overall evaluation). Some of the items belong to more than one group such as the use of visual aids.

The scale of 1 to 5 represents:

1. extremely poor or unacceptable
2. poor but above unacceptable
3. average
4. above average but not excellent
5. excellent

In evaluating research papers and presentations one has to evaluate, evidence of these three groups of items being met. The assessment rubric that follows attempts to clearly specify such evidence for each rating level.
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APPENDIX E: ANNOTATED BIBLIOGRAPHY OF ARTICLES


**Self-Assessment:** (Annotation provided by Sheffield-Hallam University, Learning and Teaching Resource Center) A number of case studies in education show that self-assessment is possible and is a potentially valuable aid in teaching and learning. However, many of these case studies seem to be dealing with small groups of advanced and fairly well motivated students and so do not necessarily apply to large groups sizes and lower levels of higher education. This paper looks at the case for self-assessment and argues that self-assessment is a valuable teaching and learning aid, but that students need to develop skills in self-assessment. The paper discusses some learning tasks which may develop this skill and argues that these need to be put into a coordinated framework. The paper also examines some of the problems of self-assessment. This paper was produced as a result of trying to introduce an element of self-assessment in a level 1 math and statistics unit for an HND in business and finance. (This abstract was originally printed in the journal article.)


**Assessment of competencies:** National Vocational Qualifications provide the impetus for this exploration of assessment in higher education. Tying "the purpose of higher education" with assessment issues, the article concludes with recommendations for taking action on assessment at national, institutional, departmental and individual levels.


**Critical Thinking Skills and Related Testing:** Reference source: A catalog of resource materials for teaching accounting students critical thinking, edited by Karen Pincus and prepared for the Pedagogical Resources Committee of the Federation of Schools of Accountancy. This paper examines ways in which the teaching of critical thinking skills at the college level have been evaluated. Several methods for the assessment of critical thinking skills are outlined.

Self-Assessment: (Abstract provided by the Sheffield-Hallam University TLRC (Teaching and Learning Resource center). Self assessment is described as, "students taking responsibility for monitoring and making judgments about aspects of their own learning." This booklet presents a brief background and history of this form of student assessment, discusses the implications for teachers and examines some key issues. Five case studies in a range of subject areas illustrate the application of self assessment in undergraduate courses.


Self-Assessment: While the educational benefits of student self-assessment are being increasingly recognized and self-assessment procedures introduced into post-secondary courses of many different kinds, the use of self-assessment for grading purposes is a more controversial matter. Is there a role for student self-assessment in formal assessment proceedings? If there is to be a role, what should it be? This paper focuses on these questions and examines why a marking role for self-assessment should be considered and what evidence is available on the reliability of student-generated marks. The implications of these findings are considered and strategies are proposed to improve student markers reliability and to incorporate self-assessment indirectly into the formal assessment process. (Abstract taken from journal article.)


Assessing Higher-Level Thinking Skills: The author addresses ten indicators of intellectual growth in a student. A critical characteristic of intellectual ability is not only having information, but knowing how to act on it. Because many standardized tests do not recognize this fact, using some other form of assessment such as observing the ten indicators is necessary in curriculums which stress critical thinking.

Peer Assessment: The authors review some of the literature pertaining to peer assessment. Classroom performance studies focus on interpersonal skills and group dynamics. Peer assessment was found to be beneficial and a reliable, useful exercise. There was a close correlation between peer and instructor grades.


Self and Peer Assessment: The article describes, in great detail, the process of involving students in the assessment process. A statistical study of assessment results is also provided.


Assessing Higher-Level Thinking Skills: Assessment for student learning and of student performance, formative and summative, is a crucial quality issue and the paper discusses principles and procedures of taxonomies for good practice in regard to assessment. Five taxonomies with some variations, are described; exhibits are used to present details. The implications of a taxonomic approach to assessment are profound in that the use of taxonomies requires peer discussion and provides a framework for accountability and quality assurance. From a pedagogical point of view, there should be a clear and justifiable link between objectives, assessment and outcomes, with appropriate teaching and assessment methods selected by teachers. From a quality point of view, a taxonomic approach is an indicator of quality assurance. (Abstract taken from journal article.)


Assessing Higher-Level Thinking Skills: [Source of abstract: ERIC] Four presentations from the 1985 Annual Michigan School Testing Conference on "Assessing Higher Order Skills" are offered in this paper, and the chairman of the First General Session provides an introductory section. The papers individually and collectively address the problem of defining higher order thinking skills. A second major question facing those interested in teaching and testing thinking skills involves whether such skills should be taught and tested as a separate subject area or embedded and if used in existing subject matter. The paper by Michael H. Kean offers a concise treatment of the major questions facing those who would embark on the teaching and testing of higher order thinking skills. Edward D. Roeber and Betty L. Stevens describe the activities in Michigan during the planning and development stage for testing higher order skills, and outline the alternative approaches being considered by state-level decision makers. Joan Boykoff Baron's paper provides an analysis of Connecticut's experience in implementing a higher order thinking skills
component in an ongoing assessment program. John Farmer and Mark Daniel provide a recapitulation of problems and prospects through a discussion of several recent developments in the assessment of higher order thinking skills.


*Learning and Assessment:* This paper explores the use of non-conventional assessment methods to improve student learning. Group projects and peer assessment are found to be a reliable indicator of student achievements. Positive effects on learning are revealed through case studies.


*Assessing Higher-Level Thinking Skills:* The author argues that the assessments of student thinking should be based on a core of essential skills that apply to academic, everyday, and novel situations, and should include a variety of test items that require sustained reasoning. He contends that in the future, these tests will define and test what should be accomplished in instruction rather than what is currently addressed. The paper is broken into conceptions of higher-order thinking skills and recommendations for designing higher order thinking skills tests.


*Testing Higher-Level Thinking Skills:* This article provides an overview of research on metacognitive skills and the potential for improving assessment in instruction. The authors identify strengths and weaknesses of current assessment practices. They focus on the cognitive skills necessary for success and skilled performance in professional environments.


*Testing Higher-Level Thinking Skills:* The authors provide an overview of assessment of higher-level thinking skills. They also introduce the reader to some commercially available tests, yet describe the weakness thereof. The authors recognize that skills-
appropriate testing needs to be developed and explain the error in testing for content when we need to begin to test for higher-level cognitive skills.


**Assessment schemes**: The author presents and supports the case for changing assessment methods to this more student centered approach. The link to employer requirements is discussed. Collaboration in assessment breaks from more traditional methods and provides an assessment environment useful to students in a formative sense.


**Peer and Group Assessment**: Because of the kind of learning that peer assessment encourages, it should be developed and used, especially for group projects. The author argues for group assessment of oral presentations by the groups.
RESOURCES
BOOK


SYNOPSIS  Definition resource for "critical thinking" and related topics. Much of the book explores basic theory surrounding the development of critical thinking skills and then suggests the introduction of discipline-specific critical thinking courses. Assessment within critical thinking courses is addressed, briefly. Suggestions for "critical thinking across the curriculum" and some institutional experiences are presented, with a call for additional research and reports on the implementation of outlined concepts. The resource list at the end of the publication is extensive. Updated topical references available through ERIC’s monthly bibliographic journal, Resources in Education (RIE).

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PROVIDER  Copies of referenced papers can be ordered through ERIC Document Reproduction Service, ERIC Clearinghouse on Higher Education, ASHE (Association for the Study of Higher Education)

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<table>
<thead>
<tr>
<th>RESOURCE</th>
<th>Learning from Case Studies, 2nd edition by Geoff Easton, Prentice-Hall Incorporated</th>
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<tr>
<td>SYNOPSIS</td>
<td>For the teacher who is either just beginning to use cases (simulations) as assignments or for those who are frustrated with case assignment outcomes, this book serves as a reference for improving learning. The author addresses issues in the use of cases as coursework assignments and describes a step-by-step approach. The book explains each step, describes rationale, and each step is demonstrated. (214 pages). A list of &quot;further readings&quot; and &quot;other useful books&quot; is included at the end of the text.</td>
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<td>RESOURCE</td>
<td>Teaching Thinking, by Edward De Bono</td>
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<td>SYNOPSIS</td>
<td>While most of the reference throughout this book is to teaching children, rather than adults, the theory is applicable to all teaching levels. De Bono does refer to adult learners in several chapters. Teaching thinking as a skill can be incorporated in coursework throughout the curriculum. This book provides background theory, identifies typical pitfalls to helping students develop thinking skills, and contains results of several studies on the subject. (260 pages)</td>
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**BOOK**

**RESOURCE**  

**SYNOPSIS**  
The author has provided a consolidated summary of teaching theory and practice. This is a sound reference for a teaching professional, either early in his/her career, or as a refresher for the educator who is struggling with the demands of changes in the classroom environment. Major sections of the book cover "learning and teaching," "re-design of existing courses," and "evaluation and improvement in the quality of teaching and learning." The topic of appropriate assessment methods is discussed throughout each section.

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Routledge  
ISBN number: 0-415-06415-5 paperback  
0-415-06414-7 hardbound

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RESOURCE  
*Assessing Student Centered Courses* by Graham Gibbs, The Oxford Centre for Staff Development, 1995

SYNOPSIS  
For teachers who use, or want to use, a variety of assessment methods for coursework, this book offers definitions, theory and the result of case studies for grading schemes. These assessment designs include assessing group work, the use of diaries and journals, and self and peer assessment. The author also addresses learning contracts and negotiated assignments. (151 pages)

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The Oxford Centre for Staff Development, 1995

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The contributors to this book wrote on various assessment topics, including, but not limited to, questions about what should be assessed, the effects of assessment (on students and faculty), and assessment reform. The book consists of 13 papers and a comprehensive list of references. (186 pages)
**BOOK**

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<td>SYNOPSIS</td>
<td>In this handbook, the authors differentiate between testing (summative assessment) and classroom feedback (formative assessment). Various classroom assessment techniques are listed and the appropriateness of each is described. Also provided are recommendations and guidance for interpretation of student work.</td>
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This book contains sections which provide recommended evaluation techniques for each level of "The Cognitive Taxonomy of Educational Objectives." The information in this book is useful for test design. The assessment guidance distinguishes between diagnostic testing, formative feedback and summative evaluation.

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McGraw-Hill

New York, NY

NA

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Begin with a review of "Bloom's Taxonomy of Educational Objectives," this book takes the reader through the educational process, ending with some alternative methods of assessment; peer and self-assessment. It can be described as a step-by-step guide to testing and assessment, with a focus on matching learning objectives to the appropriate assessment.
SYNOPSIS Emphasizes the move from a focus on teaching to a focus on learning. The authors see the needs of the learner changing. There is the added need to match assessment systems with the new educational environment. The five sections of the book contain suggestions for group activities and each has its own annotated bibliography.

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PROVIDER London Kogan Page
ISBN: 0749413018

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<td>SYNOPSIS</td>
<td>The assessment of competence provides special problems. Traditional assessment methods are losing their effectiveness in student learning. Institutions are changing their focus to competencies. Planning must be used to link assessment and accountability.</td>
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This book contains 40 chapters developed from papers presented at the 2nd International Improving Student Learning Symposium... They provide evidence of...attempts to improve the quality of teaching and learning in higher education. This movement is scholarly rather than wholly pragmatic, but ‘applied’ rather than ‘pure,’ and uses theory and research tools to understand and intervene in student learning. Those undertaking the research are often those directly involved in making decisions about course design, teaching methods and, especially, assessment methods: the lecturers themselves. In some cases students are involved too, and examples of both collaborative course design and student research are to be found among these pages. (Synopsis provided by Sheffield-Hallam University, Teaching and Learning Resource Center.)
The Experience of Learning, by F. Marton, D. Hounsell, and N. Entwistle (1984)

SYNOPSIS This book includes chapters on research findings, e.g. how assessment influences deep or surface approaches to learning.

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USE REQUIREMENTS NA

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RESOURCE Assessing Students: How Shall We Know Them? 2nd ed., 1987 by D. Rowntree

SYNOPSIS Working from the view that assessment methods can largely determine what and how students learn, the text examines the nature, purposes and side-effects of assessment, and discusses issues underlying assessment procedures. Five key dimensions of assessment are considered in detail - why assess; what to assess; how to assess; how to interpret; how to respond. The book concludes with proposals for making assessment work in the best interests of students.

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This chapter examines the two most commonly used tests for measuring critical thinking: the Watson-Glazer Critical Thinking Appraisal and the Cornell Critical Thinking Tests. It is argued that neither test in fact measures critical thinking in any reasonable sense. The author contends that our understanding of the concept of critical thinking can be illuminated by examining the precise reasons for these failures.

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St. Martin's Press, Inc

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SYNOPSIS

In this chapter, the authors propose a list of desirable features of a measure of reflective thinking. Then, they examine a range of available measures of critical thinking (broadly defined) and evaluate the extent to which these measures provide information about, reflective reasoning, that is, how people reason about ill-structured problems.

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This chapter discusses the assessment of reflective judgment, reasoning through ill-structured problems. The authors focus on the Reflective Judgment Interview (RJI), developed to elicit information regarding individuals' fundamental assumptions about knowledge and how it is gained. First, the specific structure and process of the RJI are described. Verbatim excerpts from two interviews are included, then the psychometric properties of the RJI are summarized. Finally, the authors describe three alternative approaches to assessing reflective judgment.

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SYNOPSIS
Commissioned by the United States Department of Education, Office of Educational Research and Improvement of the National Center for Education Statistics, this paper presents a model for the national assessment of higher order thinking. In the preface, the authors delineate the problem of lower order learning and summarize the state of research into critical thinking and educational reform. The first section explicates 21 criteria for higher order thinking assessment. To meet these criteria, the authors argue for a rich, substantive concept of critical thinking in the second section. Then, the four domains of critical thinking, elements of thought, abilities, affective dimensions, and intellectual standards are discussed. Then, the authors recommend how to assess the various domains of critical thinking, the test strategies that may be used, the value of the proposed strategy for the reform of education, and the suggested implementation of the proposal.

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PROVIDER The Foundation for Critical Thinking
CONTACT PERSON Richard Paul
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This paper provides the reader with specific examples of applying intellectual criteria and standards to students' reasoning. The authors explain the significance of reasoning having "elements," then the need for standards in assessing reasoning. They take us through each of the elements of reasoning, giving us a general sense of the interface between elements and standards. Finally, they provide a series of charts, characterizing the differences between how good and bad reasoners handle the components of their reasoning. Of practical importance, the authors include examples of feedback which teachers might give to students regarding each of the components of their performance as reasoners.
In this chapter the authors review assessment procedures that can be used in the classroom and on the institutional level to measure critical thinking. Their emphasis is on techniques that can be used across the curriculum. First, the item being measured is defined. Next, different approaches to assess critical thinking are discussed. Finally, the authors provide examples of colleges and universities which are implementing critical thinking assessment into the curriculum.
This chapter focuses on the evaluation of students' levels of proficiency to determine both placement and the extent of their progress in a course. Evaluating homework assignments is the first topic of discussion followed by the evaluation of performance in class discussions. Testing is the last area covered with guidelines and recommendations presented on choosing a commercial test and designing your own test.

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SYNOPSIS
In this chapter, the author considers critical thinking and assessment with the aim of suggesting ways that educators can work within the structures of their institutions to ensure that assessment occurs and that student learning improves. Based on experiences at Alverno College with ability-based education and assessment, the author discusses principles, which help ensure that students do indeed think critically. The author includes a definition of critical thinking, explains the critical thinking curriculum at Alverno College, and justifies why attention to the following ten features enhances the assessment process. Assessment, is an integral part of learning; must involve a range of behavior; must involve application of an ability that represents the expected learning outcomes of a course, program, department, or institution; involves expert judgement based on explicit criteria; incorporates structured feedback; occurs in multiple modes and contexts; incorporates an external dimension; is cumulative; incorporates open-ended possibilities; and of oneself is an essential part of the process.

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This chapter describes a systematic process for planning and conducting more thoughtful and sound classroom assessments. The authors briefly describe assessment methods appropriate for use by classroom teachers, organized in a Framework of Assessment Approaches. They examine principles of sound classroom assessment and present an Assessment Planning Chart. They also illustrate the planning process, framework, planning chart, and seven of the assessment methods in use.

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Skylight Publishing, Inc.

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708-991-6420

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This chapter addresses developing evaluations of thinking skills and dispositions. In the first section four evaluation dimensions are outlined, as well as ten characteristics of effective evaluations. Next, the author explores the teacher as thinking skills evaluator. The teacher is encouraged to: (1) use both a wide-angle and telephoto lens in assessment, (2) evaluate continually, (3) look for sustained effects, transfer, side effects, and metacognition, (4) use a variety of approaches to evaluate thinking including discussions, writing, tests, other performance tasks, and unobtrusive measures, and (5) interpret results. Lastly, the author reviews the role of the school administrator and program developer in evaluating thinking skills.
In this short piece, the author addresses ten indicators of intellectual growth in a student. A critical characteristic of intellectual ability is not only having information, but knowing how to act on it. Because many standardized tests do not recognize this fact, using some other form of assessment such as observing the ten indicators is necessary in curriculums which stress critical thinking.

This is a list of eleven standardized tests that could be called critical thinking tests. This listing is divided into general critical thinking tests, which make an attempt to cover critical thinking as a whole, and aspect-specific critical thinking tests, which focus on one aspect of critical thinking.

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SYNOPSIS

The authors argue that students tend to take seriously only tasks for which teachers hold them accountable through testing. Therefore, students must be held accountable for their performance on the processes, skills, and other aspects of the dimensions of thinking. To this end teachers need to create better classroom tests as magnets for student attention. And, the concept of test must expanded to include the richer, more dynamic aspects of thinking. The authors touch on applying criteria for effective assessments; creating better classroom tests; using performance tasks on large-scale assessments; using classroom-based qualitative evaluation; distinguishing good assessments from good instructional tasks; using standardized, norm-referenced basic skills, and 'teaching to' or 'studying for' the test.

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