Assessment and Evaluation for Distance Learning

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Definitions of assessment and evaluation

- Assessment is a kind of quantitative description to indicate how much a learner achieves his/her educational goal.
- Assessment of student learning is the purposeful elicitation of information from the students, mainly based on their course objectives and usually through some structured inquiry process or tools.
- Evaluation is a systematic decision-making process to judge how much a learner achieves his/her goal quantitatively or qualitatively including its value.

Evaluation = measurement + value judgment
Evaluation = non-measurement + value judgment
9 Principles of Good Practice for Assessing Student Learning

- It begins with educational values.
- It is most effective when it reflects an understanding of learning as multidimensional, integrated process.
- It works best when the programs have clear, explicitly stated purposes.
- It requires attention to outcomes and equally to the experiences that lead to those outcomes.
- It works best when it is ongoing not episodic.
- It fosters wider improvement when representatives from across the educational community are involved.
- It makes a difference when it begins with issues of use and illuminates questions that people really care about.
- It is most likely to lead to improvement when it is part of a larger set of conditions that promote change.
- Through assessment, educators meet responsibilities to students and to the public.
What are assessment functions?

Assessment has three main functions: choose, learn, and qualify.

- "Choose" refers to the act of selecting appropriate course objectives.
- "Learn" covers the use of assessment in support of learning,
- "Qualify" refers to the certification of accomplishment.

From a program perspective, the corresponding terms are: Place (select), monitor, and report.
What is evaluation of student learning?

- Evaluation of student learning is an analysis of the student achievement based on various sources of information accompanied, typically, by some judgments of quantity and quality with respect to one or more aspects.

- The evaluation often employs the results of the assessments described previously along with other measures.
What is distance learning and its family?

- **Related terms:**
  - Distance Education, Distance Learning or Long Distance Learning,
  - Online Education or Online Learning,
  - Distributed Learning,
  - Internet Education,
  - Computer-based Training,
  - Computer-Mediated Communication,
  - Computer-Assisted Instruction,
  - Virtual Education,
  - Cyber-Learning,
  - Asynchronous Learning,
  - Multi-modal Instruction,
  - Flexible learning,
  - e-Learning or Internet-enabled learning
Their differences

The meanings of these terms are starting to converge. They are different in terms of:

- place (same place, any place, on-campus, off-campus);
- time (same time -- synchronous or different time -- asynchronous);
- interaction (learner to computer; learner to instructor; learner to other learners);
- use of the computer (presentation, interactive, collaborative, generative);
- type of technology (text, audio, video, multimedia); and
- absence or presence of face-to-face interaction.
e-Learning vs Distance Learning

- e-Learning is learning through the use of information and communication technologies (ICT), such as PCs, the internet and digital interactive television. e-Learning is sometimes also referred to as "technology-based learning" and it can be either asynchronously or asynchronously or both.

- Distance learning takes place when a teacher and student(s) are separated by physical distance, and technology (i.e., voice, video, data, and print), is used to bridge the instructional gap.
  - Traditional high-end distance learning technologies require special-purpose equipment or services (video-conferencing rooms, satellite uplinks).
  - At the low end, it uses public services designed for one-way broadcast (such as television) or point-to-point connections (the switched telephone network), severely limit the interaction between participants.
A close look at e-Learning

e-Learning is defined by the Open and Distance Learning Quality Council in the UK (http://www.odlqc.org.uk/odlqc/n19-e.htm) as "the effective learning process created by combining digitally delivered content with (learning) support and services." Embedded in this definition are the following important words:

1. **effective** - learning that succeeds
2. **combining** - the combination of ICTs and pedagogy makes the difference (some call it blended learning)
3. **digitally delivered content** - content delivered electronically by CDs, cell phones, the computer, and the Internet
4. **support** - support provided by tutors, facilitators or course coordinators
The readiness model for e-Learning Assessment and Evaluation

- **Psychological readiness**
  - Are you ready to be evaluated?

- **Sociological readiness**
  - Are your colleagues and students ready to be evaluated?

- **Environmental readiness**
  - Are stakeholders ready to be evaluated?

- **Human resource readiness**
  - Are the evaluators available and ready to evaluate?

- **Financial readiness**
  - Do you have enough money?

- **Technological skill readiness**
  - Do you have enough technical competencies?

- **Equipment readiness**
  - Do you have enough equipment?

- **Content readiness**
  - Do you know what to evaluate?
Evaluation Dimensions

- Context (K-12, higher education, corporate, etc.)
- Content (academic, professional training, etc.)
- Technology (network capacity, multimedia resources, etc.)
- Program infrastructure (student community, technical support, etc.)
- Instructional strategy (ISD, use of video, etc.)
- Student characteristics (learning style, motivation, e-learning experience, etc.)
E-Learning and Assessment Tools

- **Formative assessment.** Scoring should be done automatically to provide immediate feedback, e.g.
  - Tests
  - Quizzes
  - Case studies
  - Projects / assignments
  - Presentations
  - Authentic assessment

- **Summative assessment.** The key issue is how to make it valid, secure, and cost-effective, e.g.
  - Tests
  - Presentations
  - Projects / assignments
  - Portfolios
The Process of e-Learning and Assessment

Skills gap analysis

Skills profiling

E-learning

Certification

Self assessment
Assessment Modes for e-Learning

- **CBA**: Computer-Based Assessment is an assessment which is built around the use of a computer as an assessor or so-called on screen presentation of knowledge tests, e.g. a computerized adaptive test.

- **CAA (Computer-Assisted Assessment or Computer-Aided Assessment)** and **CMA (Computer-Mediated Assessment)** are any applications of computers within the assessment process; the role of the computer is merely to facilitate the capture and transfer of responses between students and an assessor.

- **Online Assessment** is an assessment activity which requires the use of the Internet.

- **e-Assessment** is a synonym for CAA and CMA and a generic term to describe the use of computers and information technology within the assessment process.

- **Traditional or paper-based assessment** is an assessment used mainly papers and pencils.
Advantages of e-Assessment

- Make lower long-term costs
- Reduce administrative costs
- Give instant feedback to students
- Provide more interesting and motivational tests and activities
- Has greater flexibility with respect to location and timing
- Has high reliability (machine marking is much more reliable than human marking) and improved validity
- Can assess cognitive and practical abilities
- Provide more variety of tests and activities
- Increase administrative efficiency
Disadvantages of e-Assessment

- e-Assessment systems are expensive to establish and not suitable for every type of assessment, e.g. extended response questions, writing, oral communication.
- The main expense is not technical; it is the cost of producing high quality *assessment items*.
- The creation of a computerized test/item bank is more costly and time consuming than the installation and configuration of the assessment engine.
- Difficult to assess affective abilities.
7 Strengths of e-Learning

1. Flexibility — anywhere, any pace, any time
2. High level of dynamic interaction (high synergy)
3. High quality dialog in asynchronous learning
4. Student-centered
5. Level of anonymity and playing field
6. Access to rich resources
7. Creative teaching and learning
Philosophy of Student-Centeredness

- Students are actively involved and receive feedback.
- Students apply knowledge to enduring and emerging issues and problems.
- Students integrate discipline-based knowledge and general skills.
- Students understand the characteristics of excellent work.
- Students become increasingly sophisticated learners and knowers.
- Instructors coach and facilitate, intertwining teaching and assessing.
- Instructors reveal they are learners, too.
- Learning is interpersonal, and all learners---students and instructors---are respected and valued.
6 Weaknesses of e-Learning

1. Technology
   - Equity and accessibility to technology
   - Facilitators and students’ computer illiteracy
   - Limitations of technology

2. Students
   - The students’ dependency and old learning habits

3. Facilitators
   - Facilitators’ lack of essential online qualities

4. Administrators and faculty staff
   - Negative attitudes towards e-Learning

5. Online environment
   - Low levels of synergy in large classes
   - Inappropriate for some hands-on subjects

6. Curriculum
   - Mismatching between curriculum and learning activities
An e-testing or CBA system

An e-testing system comprises two components:

- an assessment engine; and
- an item/test bank

An *assessment engine* comprises

- the hardware and
- software required to create and deliver a test.

Most e-testing engines run on standard hardware so the key characteristic is the software's functionality. There is a wide range of software packages, e.g. ITBank Pro, MicroCAT. The software does not include the questions themselves; these are provided by an *item/test bank*. Once created, the engine uses the item/test bank to generate a test.
Functions of an e-testing system and instructors

- Online testing can be automated for objective tests, or if open-ended questions are asked, saved in files for instructor critique.

- Assessment of online portfolios and other inquiry-oriented activities in which students are given specific tasks and access the Web to acquire, integrate, extend or refine their knowledge should be done by the instructors.
What should e-Assessment do?

- Provide diagnostic feedback
- Help instructors and assessors set standards
- Evaluate student’s progress
- Relate the results to a student's progress
- Motivate student’s performance
What should the instructor do?

- **Provide Feedback**
  
  Students need clear guidance for doing tasks and clear feedback. Once the tasks are made clear, criteria must be developed. Rubrics are useful in helping students identify and apply the standards of excellence.

- **Provide Enrichment and remediation**
  
  Assessment might lead to remediation in areas where comprehension is lacking or enrichment which extends or applies students' knowledge. Besides tests, assessment can be made more authentic by:
  
  - essays
  - portfolios
  - projects (case studies, journal articles)
  - interviews
  - rubrics
  - performance tasks
  - etc.
Why is e-learning such a hot topic?

- **A flexible approach to learning**
  - e-Learning provides this flexibility by making materials available on corporate networks, the internet and on CD-ROM, individuals can take charge of their own learning -- learning at a pace, place and time of their choice.

- **Saving costs**
  - Once the learning system is established, it can be used over and over again.

- **Enriched learning experiences**
  - e-Learning is interactive and media rich, and is consequently highly motivational. Learners can participate in a wide variety of activities as they learn, supported by text, audio, video and animations.
  - e-Learning provides limitless opportunities for innovation, to create fun, engaging and effective learning experiences.
A Typical e-Learning Course

An e-Learning course is usually divided into small, self-contained chunks, sometimes called 'learning objects'. Each chunk of learning may be comprised of any combination of these components:

- a number of screens or web pages
- texts
- audio and video clips
- animations
- interactive activities
- tests / quizzes / exercises / assignments
Common e-Learning Activities

- Webcast
- Presentation sequences
- Drills and practices
- Scavenger hunts
- Guided research
- Guided analysis
- Team design
- Brainstorming
- Case studies

- Role-playing scenarios
- Group critiques
- Virtual laboratories
- Hands-on activities
- Learning games
- Online discussions / chats
- Bulletin boards
- Collaborative assignments
- Web publications
# Assessment tools and activities

- Online tests / exams / quizzes
- Online discussions / chats
- Bulletin boards
- Collaborative assignments
- Self assessments
- Computer-marked assignments
- Portfolios
- Role-plays
- Simulations
- E-mails
- Web publications
- Web designs and developments
- Workbooks
- Case studies
- Projects / assignments
- Digital imaging
- Videotaped online role-plays
- Workplace simulation
- Problem-solving scenarios
- Work-based activities
- On-the-job demonstration
- Exercises
- Journal writing
- Diary writing / log writing
# Online Assessment Grids

<table>
<thead>
<tr>
<th>e-mail</th>
<th>To receive, track and return reports, assignments and essays. With learner permission, to place them on bulletin board for further discussion or peer review.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online discussion</strong></td>
<td>To set tasks for individuals or teams to discuss and to monitor contributions by learners.</td>
</tr>
<tr>
<td><strong>Bulletin boards</strong></td>
<td>To place topics on bulletin boards as the starting point for online collaborative assignment. To post learner work, with prior consent on bulletin boards</td>
</tr>
<tr>
<td><strong>Collaborative assignment</strong></td>
<td>To set authentic tasks that learners have to investigate and solve.</td>
</tr>
<tr>
<td><strong>Self-assessment</strong></td>
<td>To give instant online feedback through QN, M/C and FAQs.</td>
</tr>
</tbody>
</table>
# Online Assessment Grids

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer review</td>
<td>To allow learners to review each other’s work and to encourage them to share their work to build collective skills and knowledge of the group.</td>
</tr>
<tr>
<td>Participation in online discussion</td>
<td>To make learners to review, assess and critique the work, adding complexity and depth to the original piece of work.</td>
</tr>
<tr>
<td>Online exam</td>
<td>To assess learners’ achievement in summative assessment for a large component with start and stop times, or with login, passwords and timeouts.</td>
</tr>
<tr>
<td>Online quizzes</td>
<td>To assess learners’ achievement in formative assessment for a small component during the course.</td>
</tr>
<tr>
<td>Role play</td>
<td>To allow learners to get into the character of the people they are researching and, with anonymity, to express their ideas freely.</td>
</tr>
</tbody>
</table>
Online Assessment Grids

<table>
<thead>
<tr>
<th>Computer-marked assignments</th>
<th>To give instant feedback to the learners when they take objective exams and quizzes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolios</td>
<td>To store and arrange learners’ materials in a learning management system for instructors to provide feedback, review and monitor their progress.</td>
</tr>
<tr>
<td>Simulations</td>
<td>To give learners a good chance to solve a problem or learn something new in a certain situation.</td>
</tr>
<tr>
<td>Web publication</td>
<td>To encourage learners to write and publish articles and assignments in web-based publications allowing for peer and faculty review.</td>
</tr>
<tr>
<td>Web design and development</td>
<td>To allow learners to self and peer assess its content and design and to take an observer’s critical look at the work.</td>
</tr>
</tbody>
</table>
Types of Assessment Best Used in an Online Environment

- Multiple-choice questions
- Short-answer quiz
- Formative assessment activities
- Simulation
- Discussion/bulletin boards
- Online collaboration
- e-mail submission
- Knowledge checking
- Reflection journals
- Projects
- e-mail games

(Booth and Others, 2003:32)
Popular Types of Online Assessment

- e-mail submission of essay / portfolio
- Multiple-choice, true/false
- Short-answer responses
- Chat room
- Bulletin board / threaded discussion
- Simulation
- Self-assessment

(Booth and Others, 2003: 31)
An example: Journal Writing

Advantages

1. Provides an aid to our memory.
2. Provides a basis for creating new perspectives.
3. Enhances critical thinking skills.
4. Provides psychological/emotional advantages.
5. Offers opportunities to increase empathy for others.
6. Provides a practical way to understand books/articles.
7. Provides support for self-directed learning activities.
Assessment Methods (1)

1. Online Assessment
Assignment questions are sent to students by instructors using e-mail, WWW pages, newsgroups and listserv's. All completed written assignments are e-mailed back to the instructors and must be in an agreed format such as ASCII, HTML or a simple text editor format. All assessment and marking of assignments is done online without the necessity of printing out.

2. Self Assessment
Input forms are created on WWW documents allowing for multiple, dichotomous and other questions. This system facilitates automatic marking of self assessment questions which are immediately responded to. Students therefore receive feedback on that process within a few seconds of submitting a self assessment form. Where appropriate, student marks may be accumulated from the self assessment questionnaires and the database automatically updated.
3. **Computer-aided or Internet-delivered Assessment**

Tests, quizzes and exercises are sent to students by courseware using Internet, LAN, intranet or CAI. All completed tasks are automatically marked by the program and stored in a web server, a computer or a diskette. The program can give them feedback instantly. They can see their progress while learning and the instructors can use their marks for assessment and evaluation later.

4. **Peer Assessment**

Tests, quizzes, exercises and assignments are sent to students by courseware or instructors using Internet, LAN, intranet, CAI or post. All completed tasks are assessed, evaluated and marked by their peers using a set of criteria or rubrics. Teaching assistants or tutors store the marks onto a diskette and send it back to the instructors. They also can give them feedback. The students can see their progress while learning and the instructors can use their marks for assessment and evaluation later.
5. **Online presentation assessment**

A real-time, online presentation can be made using TV conference technology on the objectives outlined in the course. The instructors are able to view the document using a browser while alternatively following a discussion or presentation.

6. **Traditional paper-based assessment**

To control the quality of learning, traditional paper-based assessment can be used at regular intervals, e.g. mid-term exam and final exam.
7. Evidence-based assessment

To assess students’ performance and competence in learning, assessment tasks are based on their demonstrated capability to underpin knowledge. Some tasks can be sent to the students by Internet, e-mail or post and completed tasks are assessed by the instructors, tutors or peers at a learning center. Some can be assessed by the instructors if needed ICT facilities are available.

8. Workplace-based assessment

To make the assessment authentic as much as possible, the instructors may visit the students’ workplace and assess how they perform their tasks specified in course objectives.
9. **Collaborative assessment**

To make the students work together, they are assigned to find ways to solve a problem focusing also on how they are affected and how they have been effective against it. The instructors can send the problem to them by the Internet, e-mail or post but they have to work together in person, through webs, or other electronic means and send their completed assignment back.

10. **Innovative assessment**

It is any form of assessment which involves the application of a whole range of different new and old techniques and methods to improve the quality of student learning. It is not just something which is 'done to' students but also 'done with' and 'done by' students. Its primary goal is about getting to know students and the quality of their learning, e.g. *self-assessment*, *peer assessment*, *portfolios*, *journal writing* and *collaborative assessment*. 
11. **Diagnostic assessment**

To identify the students’ learning needs and their knowledge background of the course, a diagnostic test can be used before the course starts. The results of the test can be used for course placement and course design. *Online assessment, traditional paper-based assessment* and *computer-aided assessment* can be used for such purposes.

12. **Formative assessment**

To accumulate the students’ learning progress and to improve learning activities, various types of assessment such as *online assessment*, *traditional paper-based assessment*, *peer assessment* and *computer-aided assessment* should be used frequently.
13. **Summative assessment**

To measure the students’ overall achievement of the course, many types of assessment such as *online assessment, traditional paper-based assessment, online presentation assessment, evidence-based assessment* and *workplace-based assessment* should be used at regular intervals, e.g. mid-term and final exams.

14. **Authentic assessment**

It is a form of assessment in which students are asked to perform real-world tasks that demonstrate meaningful application of essential knowledge and skills that they have mastered, e.g. *online presentation assessment, peer assessment, portfolios, and journal writing.*
Traditional vs Authentic Assessments

**Traditional**
- Selecting a response
- Contrived
- Recall/Recognition
- Teacher-structured
- Indirect Evidence

**Authentic**
- Performing a task
- Real-life
- Construction/Application
- Student-structured
- Direct Evidence
How to create authentic assessment?

1. What should students know and be able to do?
2. What indicates they have met the standards?
3. What does good performance on this task look like?
4. How well did they perform?
5. Benchmark
6. How well should most of them perform?
7. What do they need to improve upon?
8. Adjust instruction
9. Standards
10. tasks
11. Criteria
12. Rubric
Creating a rubric

A rubric is a scoring scale used to assess student performance along a task-specific set of criteria.

There are 2 types of rubric:

1. Analytic rubric
   A scoring scale that articulates levels of performance for each criteria and performance is judged separately for each criterion.

2. Holistic rubric
   A scoring scale that assigns a level of performance by assessing performance across multiple criteria as a whole.
Five key elements in a rubric

1. **Levels of mastery**
   - Achievement is described according to terms such as excellent, good, needs improvement and unacceptable.

2. **Dimensions of quality**
   - Assessment can address a variety of intellectual or knowledge competencies that target a specific academic discipline.

3. **Organizational groupings**
   - Students are assessed for multidimensional skills such as teamwork involving problem solving techniques.

4. **Commentaries**
   - It provides a detailed description of the defining features that should be found in the work.

5. **Descriptions of consequences**
   - It offers students insight into various lessons of their work in a real life setting.
# A sample of analytic rubric: Oral Presentation

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Never</th>
<th>Rarely</th>
<th>Smtimes</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make eye contact.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Volume is appropriate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enthusiasm is evident.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary is accurate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body language is appropriate.</td>
<td></td>
<td></td>
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</tbody>
</table>

12/16/2010 Suphat Sukamolson
A sample of holistic rubric: Oral Presentation

**Mastery**
- Usually makes eye contact
- Volume is always appropriate
- Enthusiasm present throughout presentation
- Summary is completely accurate
- Always use body language appropriately

**Proficiency**
- Usually makes eye contact
- Volume is always appropriate
- Enthusiasm present in most of presentation
- Only one or two errors in summary
- Usually and appropriately use body language
Steps of Computer-aided or Internet-delivered Assessment

1. Identify the student.
2. Select the appropriate test.
3. Start the test.
4. Carry out the test content.
5. Stop the test after the required time period.
6. Mark the test and place the results securely into the desired location.
Challenges for e-assessment and possible solutions

1. Limited capability to assess performance outcomes
   - Include blended learning.
   - Clarify which type of performance-based outcomes can be assessed.

2. Lack of assessment of higher-level cognitive skills
   - Clarify the roles of formative assessment, self-assessment and knowledge-based testing.
   - Include examples of higher-level cognitive skill tests or tasks and delivery practice.

3. Difficulty of guaranteeing authentication and preventing plagiarism
   - Clarify whether or not these concerns apply to all forms of assessment.
   - Document how instructors rate the students’ authentication risk and what measures they are going to take.
Challenges for e-assessment and possible solutions

4. Difficulty of using constructivist approaches to e-Learning
   - Clarify which learning contexts are appropriate for constructivist approaches to learning and assessment.
   - Gather examples of collaborative assessment and delivery practice.
   - Provide a rich, exploratory information environment, e.g. wide options, learner choices and multiple perspectives.

5. Difficulty adjusting to accessibility standards
   - Use high speed Internet when it is possible.
   - Use LAN, intranet, and computer facilities or even traditional paper-based assessment.

6. Information overload – the uneven quality and reliability of materials
   - Use off-line information.
Assessment and evaluation tools

- Tests
- Questionnaires
- Opinionnaires
- Evaluation forms
- Interviewing
- Observation forms
- Tasks
- All the tools and learning activities for e-Learning
## Typical Characteristics of Various Tests

<table>
<thead>
<tr>
<th>No.</th>
<th>Types</th>
<th>Items Types</th>
<th>Difficulty</th>
<th>Discrimination</th>
<th>Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Proficiency</td>
<td>heterogeneous</td>
<td>difficult</td>
<td>high</td>
<td>not clear</td>
</tr>
<tr>
<td>2.</td>
<td>Achievement</td>
<td>heterogeneous</td>
<td>moderate</td>
<td>moderate</td>
<td>clear</td>
</tr>
<tr>
<td>3.</td>
<td>Aptitude</td>
<td>homogeneous</td>
<td>moderate</td>
<td>high</td>
<td>none</td>
</tr>
<tr>
<td>4.</td>
<td>Diagnostic</td>
<td>homogeneous</td>
<td>easy</td>
<td>low</td>
<td>clear</td>
</tr>
</tbody>
</table>
Types of evaluation and their philosophies

- Criterion-referenced evaluation &
  Domain-referenced evaluation
- Self-referenced evaluation
- Norm-referenced evaluation

In the field of education, after a student evaluation, grades are assigned. As for e-Learning, all instructors or facilitators are also required to do so. What should you do?
What is a grade?

A grade is ...

- a number, a letter or a symbol indicating the relative quality of a student’s work in a course, test or special task, or

- a mark

It represents a value judgement concerning the relative quality of a student’s achievement of course objectives during a specified period of instruction.
Therefore, a grade ...

- is a reflect of the student’s work
- is focusing on the student’s achievement of performance.
- is not the amount or “effort” expended, working habits, attitude, character traits, etc.
- is resulted from a single or multiple tasks
- is a number, a letter or any symbol
- can be a score or mark
The importance of a grade

- A grade is a "certification of competence" that should reflect, as accurately as possible, a student's performance in a course.
- If the learning goal is achieved, then grades will have the same value from semester to semester and from year to year.
Concepts in Learning and Evaluation

Ways of Learning and How to Evaluate

Behaviorists  Humanists  Pragmatists
1. Learning and Evaluation Philosophy of Behaviorists

- Their beliefs are influenced by Skinner and his followers.
- The optimal learning conditions require a highly structured individualized approach in which materials are presented in relatively small discrete units.
- Emphasize on making the learner achieves the materials gradually bit by bit.
- Two types of reinforcement, positive and negative, should be used in learning and teaching.
- Focus on (1) the precise objectives of instruction, (2) the exact instruction sequence, and (3) specified criteria for judging if the objectives have been achieved.
Learning and Evaluation of Behaviorists

- Tell the learners about the objectives of each lesson before learning.

- The teacher sets achievement standards beforehand by himself or uses existing criteria.

- Use a diagnostic test after each lesson.

- Give supplementary tasks to low achievers (those achieve less than minimum criteria).

- Give more time to low achievers.

- Emphasize on Competency-based Learning and Criterion-referenced Evaluation.
2. Learning and Evaluation Philosophy of Humanists

- Their beliefs are influenced by Illich and Kozol.
- It primarily concerns with the values, interests and dignity of each student as a human being.
- Focus on relaxed and informal approaches to education.
- Good learning happens when a learner is happy in learning, and can learn things according to his/her own pace, aptitudes and interest.
Learning and Evaluation of Humanists

- Learners have a part in setting learning objectives of each lesson.
- Learners have time and freedom to choose to learn what they want and are interested in.
- Focus equally on both affective and cognitive domains.
- Focus on informal relationship between learners and the teacher.
- Emphasize on Cooperative Learning and Self-referenced Evaluation
Their beliefs are influenced by William James.

Focus on the practical values and consequences of education.

What the learners should learn are those that will be useful or worth for their life in the future.

Learners should learn basic skills and knowledge that are essential for their life in the future at least at a survival level.
Learning and Evaluation of Pragmatists

- Learn what are essential for life in the future.
- Help learners to find their strengths and weaknesses.
- Focus on developing the learners’ strengths for their own benefits for working in the future.
- Focus on making learners have their knowledge at least at an acceptable minimum level.
- Emphasize on Survival Learning and Norm-referenced Evaluation.
A Summary of Learning and Evaluation

Ways of Learning and How to Evaluate

Behaviorists
- Competency-based Learning
- Criterion-referenced Eva.

Humanists
- Cooperative Learning
- Self-referenced Eva.

Pragmatists
- Survival Learning
- Norm-referenced Eva.
Criterion-referenced Evaluation

(Absolute Grading)

- Grading is based on the idea that grades should reflect mastery of specific knowledge and skills.
- The teacher sets the criteria for each grade, and all students who perform at a given level receive the same grade.
- The criteria are fixed and normally preset.
Strengths

- It is easy for the teachers, students and parents to understand underlying concepts.
- It is very easy for the teachers to assign grades to their students.
The rationale for the cutoff scores is usually murky and often based on intuition rather than analysis.

It is based on the assumption that the teacher can construct valid, reliable tests and tasks at consistent levels of difficulty throughout the course.

Some teachers apply the same criterion to every evaluation component like a practice, a test and a task.

Some students may achieve a high number of points simply by doing well on many small, less important tasks.
Suggestions for using CRE

1. Review the kinds of knowledge and skills that are *implicit* in the course and make them *explicit* as course objectives.

2. Identify two kinds of outcomes: minimal objectives and developmental objectives.
   - Minimal objectives are statements of essential course outcomes and basic skills.
   - Developmental objectives are higher-order cognitive processes such as critical thinking, decision-making, and complex problem solving.
3. Use different sets of criteria for the different objectives.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Essential Objectives</th>
<th>Developmental Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% or more</td>
<td>85% or more</td>
</tr>
<tr>
<td>B</td>
<td>85 to 89%</td>
<td>75 to 84%</td>
</tr>
<tr>
<td>C</td>
<td>70 to 84%</td>
<td>60 to 74%</td>
</tr>
<tr>
<td>D</td>
<td>60 to 69%</td>
<td>50 to 59%</td>
</tr>
<tr>
<td>F</td>
<td>less than 60%</td>
<td>less than 50%</td>
</tr>
</tbody>
</table>
Two types of Objectives

1. Minimum Objectives
The students will be able to:
- skim the passages for facts and opinions;
- indicate pronoun references in the reading passages.

2. Developmental objectives
The students will be able to:
- Find implicit main idea of the passages.
- Judge the writer’s tone, attitude and values.
Norm-referenced Evaluation

(Relative Grading)

- Students are in competition with one another for a limited number of grades in each category.
- A student's grade is based on his or her relative position in the class.
- Grading is based on two assumptions:
  1. The purposes of grading is to identify students who perform best against their peers and to weed out the unworthy.
  2. Students’ performance more or less follow a normal distribution.
Strengths

- The criteria for grading each course and each time can be flexible.
- Statistically, students’ grades from each course and each time can be compared.
Weaknesses

- It is difficult for the teachers, students and parents to understand underlying concepts.
- It is very difficult for the teachers to assign grades to their students.
- Students in universities and colleges are highly selected groups and their scores are not normally distributed.
- We cannot be sure that our tests accurately measure student achievement.
Suggestions for using NRE

- Change raw scores to standard scores, e.g. z-scores and T-scores.
- Find the distribution of the standard scores.
- Use “mean and standard deviation technique” for assigning grades.
- Explain to students how their scores are transformed so they won't be confused about their averages.
Normal Grading Process

Find information from learners and colleagues in class

- observation
- tasks
- quizzes
- tests
- etc.

Learners

Find information from Learners and colleagues Outside the class

Evaluation process

learning achievement

Other factors

assign grades and send report

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a. Criterion-referenced Evaluation Grading:

1. Percentage of Raw Score Technique

- A = 90% - 100%
- B = 76% - 89%
- C = 61% - 75%
- D = 45% - 60%
- F = < 45%
Strengths and Weaknesses

- Easy to understand for learners, teachers and parents
- Ambiguous
- Arbitrary
- Untrustworthy
2. Quantity of Work Technique

- Compare learners’ knowledge or ability that can be quantified with a set of acceptable standards, e.g. number of words/minute in typing, time for 100-meter running, etc.
Strengths and Weaknesses

- Each grade has clear meanings
- Very trustworthy

- Very difficult to quantify knowledge and ability in Cognitive and Affective Domains
- Take too long to construct acceptable standards
- Suitable only for grading Motor Skills
b. Self-referenced Evaluation Grading:

1. Gained Score Technique

- Pretest learners on what they are going to learn before teaching/learning
- Conduct teaching and learning process
- Posttest the learners after the teaching/learning

Gained Score = Posttest Score – Pretest Score
Strengths and Weaknesses

- **Easy to understand for learners, teachers and parents.**

- **Learners who have good or rather good background on what to learn have more advantages than those who have poor background.**

- **Very difficult to interpret negative gained score.**
c. Norm-referenced Evaluation Grading:

1. Normal Curve Techniques

- **A** = 10%
- **B** = 20%
- **C** = 40%
- **D** = 20%
- **F** = 10%

![Normal Curve Diagram](image)
Strengths and Weaknesses

- **Can compare learners’ knowledge and ability with others because of the stable standards.**
- **The criteria are widely accepted by test and measurement experts.**

- **Not suitable when number of students is small (<100).**
- **Not suitable for a selected group.**
- **Learners, teachers and parents in general do not understand the meanings of the grades and underlying concepts.**
1.1 Preset Fixed Percentages of students
Technique

- A = 10%
- B = 20%
- C = 40%
- D = 20%
- F = 10%

Testees

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1.2 Normalized T-Score Technique

- **A = T75 - T90**
- **B = T59 - T74**
- **C = T43 - T58**
- **D = T27 - T42**
- **F = T10 - T26**

**Normalized T-Score**
2. Non-normal Curve Techniques

A = > 110
B = 96 - 110
C = 81 - 95
D = 66 - 80
F = < 66

Std. Dev = 12.19
Mean = 83.5
N = 404.00
Strengths and Weaknesses

- Suitable when number of students is small and they are selected.
- Not too difficult for learners, teachers and parents to understand their meanings and concepts.
- It is accepted by testing and measurement experts.

- Cannot compare learners’ knowledge and ability with others because of the unstable standards.
2.1 Ranges of Raw Scores Technique

- **A = 67 - 80**
- **B = 53 - 66**
- **C = 39 - 52**
- **D = 25 - 38**
- **F = 10 - 24**

![Bar Chart](image)
2.2 Ranges of Linear T-Scores Technique

- A = T67 - T80
- B = T53 - T66
- C = T39 - T52
- D = T25 - T38
- F = T10 - T24

Linear T-Scores
2.3 Percentages of Raw Scores Technique

- **A** = 95% - 100%
- **B** = 85% - 94%
- **C** = 75% - 84%
- **D** = 65% - 74%
- **F** = < 65%

Raw Scores

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2.4 Percentages of Students Technique

- **A = 10%**
- **B = 20%**
- **C = 40%**
- **D = 25%**
- **F = 5%**
2.5 Mean and S.D. Technique

\[ A = X + 1.76 \text{ S.D. and more} \]
\[ B = X + 0.76 \text{ S.D. to } X + 1.75 \text{ S.D.} \]
\[ C = X - 1.75 \text{ S.D. to } X + 0.75 \text{ S.D.} \]
\[ D = X - 0.76 \text{ S.D. to } X - 1.75 \text{ S.D.} \]
\[ F = X - 0.76 \text{ S.D. and less} \]
2.6 Mean and SEM Technique

\[ A = \bar{X} + 3.00 \text{ SEM. and more} \]
\[ B = \bar{X} + 1.50 \text{ SEM. to } \bar{X} + 2.99 \text{ SEM.} \]
\[ C = \bar{X} - 0.00 \text{ SEM. to } \bar{X} + 1.49 \text{ SEM.} \]
\[ D = \bar{X} - 1.50 \text{ SEM. to } \bar{X} - 2.99 \text{ SEM.} \]
\[ F = \bar{X} - 3.00 \text{ SEM. and less} \]

\[ \text{SEM} = \text{S.D} \sqrt{\frac{1}{n-1}} \]

Std. Dev = 12.19
Mean = 83.5
N = 404.00
### 2.7 Grade Point Average Technique

<table>
<thead>
<tr>
<th>Task 1</th>
<th>Task 2</th>
<th>Task 3</th>
<th>Mid-term</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>15%</td>
<td>25%</td>
<td>20 %</td>
<td>30 %</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>A</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>B</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>B</td>
<td>A</td>
<td>C</td>
<td>80</td>
<td>70</td>
</tr>
</tbody>
</table>

1. Change a score to grade by any mentioned technique.
2. Use weight instead of credits, find GPA.
3. Change GPA to a grade by comparing GPA with a grade value.
Elements of a Good Grading System

1. It should accurately reflect differences in student performance.
2. It should be clear to students so they can chart their own progress.
3. It should be fair.

A complete description of the grading system should appear in the course syllabus, including the amount of credit for each assignment, how the final grades will be calculated, and the grade equivalents for the final scores.
Suggestions for combining raw scores from different sources for grading

- Change each set of the raw scores to standardized scores, e.g. z-score.
- Multiply the standardized scores with the weight of each set.
- Find the averages of the standardized scores.
- Transform the average scores to T-Scores.
- Use Ranges of Linear T-Scores Technique to assign grades.
- Use both Criterion-referenced and Norm-referenced Evaluations to determine the cutoff scores for each grade.
General suggestions for assigning grades

**DO’s**

- Construct and use only high validity and reliability tests to test your students.
- Mark your exam papers consistently and fairly.
- Use both criterion-referenced and norm-referenced evaluations when assigning grades.
- It is not necessary to give your students all the grades.
- Base your grades mainly on your course objectives.

**DON’Ts**

- Combine different sets of raw scores together.
- Use Normalized T-Scores for assigning grades to selected groups or a small number of students.
- Set a cutoff score without making use of a standard error of measurement.
- Make a sin unintentionally.
Suggested Steps for Grading

1. Use both CRE and NRE.
2. Find mean and S.D. of the students’ raw scores in each component, e.g. midterm test, class work and final test.
3. Change each set of raw scores to z-scores.
4. Multiply each z-score by the weight of each component.
5. Find the average of each student’s weighed z-scores.
6. Transform each averaged score to T-score.
7. Find the distribution of all students’ T-scores.
8. Take mean and S.D. into consideration, compare the students’ raw score and their T-score and determine how many grades should be assigned.
Suggested Steps for Grading

9. If you have to assign “F”, take mean and S.D. into consideration, compare the students’ raw score and their T-score again and determine where the cutoff score for “F” should be.

10. Eliminate some outlier scores and find the range of the T-scores. (range = mix - min scores).

11. Divide the range score by the number of grades.

12. Find the interval score of each grade and draw cutoff lines between grades.

13. Find any gaps nearby each cutoff score, if any, or take SEM into consideration and adjust it.

14. Normally grade “Cs” should be in the middle of the curve if the mean is approximately 40-60% of the total raw scores.

15. Always be very considerate and take course objectives into consideration when you are assigning grades.
Some Experts’Warnings

- Until we see students willing to accept the challenge and take responsibility for their own work and learning and professors using the technology to enhance learning activities and inspire students to use the tools to their own advantages, quality "e-education" will not exist.

- Indeed, it seems to be an immutable fact that communication and self-directed learning continue to go hand-in-hand in creating and disseminating knowledge in the e-learning environment.

- An online education will never be equal to on-ground education taken at a traditional university: "the virtual university seems likely to produce only virtual learning."