Impact of Instructional Objectives on e/learning Materials

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Abstract—**A procedure for systematically planning instruction in which the specification of instructional objectives plays a key role. Objectives are important to both learners and instructors. They help learners plan their study and prepare for examinations. They guide the instructors in planning instruction and devising tests. We categorize them into three main taxonomies with their models and characteristics for writing these instructional objectives. Research in these instructions, suggests several ways to improve both learners' and instructors' motivation. Also, we show evaluation is used to provide information about the success of a course of instruction. This paper argues how instructional objectives impact on e/learning materials.**

Index Terms—**Evaluation, Materials, Motivation, Objectives.**

I. INTRODUCTION

Why do instructional designers need instructional objectives? Unless the requirements are specifically defined, the instructional designer will not know what to include in the instruction. Also without such a definition, the designer will have difficulty measuring the specific learning achieved. The benefits of the instruction are indicated in terms of what the learner is to accomplish-hence the expression instructional objectives. Clearly defined objectives are also essential for selecting the optimum instructional strategies to facilitate the learner's achievement of the objectives.

As we mentioned, stating clear course objectives is important because:

- Objectives guide the content materials and the teaching methods.
- You can use objectives to make sure you reach your goals.
- Students will understand expectations.
- Assessment and grading is based on the objectives.

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We divide instructional objectives into two main parts:

1. General instructional objectives: An intended outcome of instruction that has been stated in appropriate general terms to encompass a domain of student performance. It must be further defined by a set of specific learning outcomes.
2. Specific instructional objectives: An intended outcome of instruction that has been stated in terms of specific and observable student performance. It describes the type of performance that learners will be able to exhibit when they have achieved a general instructional objective.

II. DEFINITIONS

Instructional objectives are descriptions of the performance a learner should be able to demonstrate after instruction. Objectives are observable, specific, and measurable and are written at the course level as well as at the more specific lesson level.[8,11]

And also we define it, a statement of proposed changes in the thoughts, feelings and actions of the students. They can be very specific and precise statements or they can be written in quiet general term depending on where they are going to be used.

In addition to aiding students in studying for the course, you will find that having taken the time to clearly state objectives will prove invaluable when it comes time for you to develop any sort of test and assessment for your class.

III. DOMAINS OF OBJECTIVES

Instructional objectives, including behavioral objectives, can be written for any of the domains of instruction Cognitive, Psychomotor and Affective.[4,8,12]

A. The Cognitive Domain

This domain, receiving the most attention in instructional programs, includes objectives related to information or knowledge, naming, solving, predicting and other intellectual aspects of learning. Bloom's Taxonomy of the Cognitive Domain was one of the most influential statements about levels of knowing. The major idea of the taxonomy is that what educators want students to know (and, therefore, statements of educational objectives) can be arranged in a hierarchy from less to more complex. The taxonomy of Cognitive contains six levels, with sublevels identified for each:

- Knowledge: Student recalls or recognizes information, ideas, and principles in the approximate form in which they were learned.
- Comprehension: Student translates, comprehends, or interprets information based on prior learning.
- Application: Student selects, transfers, and uses data and principles to complete a problem or task with a minimum of direction.
- Analysis: Student distinguishes, classifies, and relates the assumptions, hypotheses, evidence, or structure of a statement or question.
- Synthesis: Student originates, integrates, and combines ideas into a product, plan or proposal that is new to him or her.
- Evaluation: Student appraises, assesses, or critiques on a basis of specific standards and criteria.

B. The Psychomotor Domain

The second category for grouping instructional objectives encompasses the skills requiring the use and coordination of skeletal muscles, as in the physical activities of performing manipulating and constructing:

- Perception: Process of becoming aware of objects, qualities, etc by way of senses. Basic in situation-interpretation-action chain leading to motor activity.
- Set: Readiness for a particular kind of action or experience; may be mental, physical or emotional.
- Guided Response: Overt behavioral act under guidance of an instructor, or following model or set criteria.
- Mechanism: Learned response becomes habitual; learner has achieved certain confidence and proficiency or performance.
- Complex Overt Response: Performance of motor act considered complex because of movement pattern required.
- Adaptation: Altering motor activities to meet demands of problematic situations.
- Origination: Creating new motor acts or ways of manipulating materials out of skills, abilities and understandings developed in the psychomotor area.

C. The Affective Domain

The third category of instructional involves objecting concerning attitudes, appreciations, values and emotion such as enjoying, conserving and respecting:

- Receiving: Being aware of or attending to something in the environment
- Responding: Showing some new behaviors as a result of experience
- Valuing: Showing some definite involvement or commitment
- Organization: Integrating a new value into one's general set of values, giving it some ranking among one's general priorities.
- Characterization by Value: Acting consistently with the new value; person is known by the value.

IV. ARCS MODEL OF MOTIVATIONAL DESIGN

The ARCS Model of Motivational Design is an easy-to-apply, heuristic approach to increasing the motivational appeal of instruction. ARCS provides a useful framework for both the design and improvement of the motivational quality of a range of informational entities-from classroom instruction to Internet resources-and increases the likelihood that these entities will be used and enjoyed. It is a well-known and widely applied model of instructional design.

According to John Keller's ARCS Model of Motivational Design, there are four steps for promoting and sustaining motivation in the learning process. Keller breaks each of the four ARCS components down into three strategy sub-components. The strategy sub-components and instructionally relevant examples are shown below: [1,2]

A. Attention

- Perceptual Arousal: provide novelty, surprise, incongruity or uncertainty. e.g. The teacher places a sealed box covered with question marks on a table in front of the class.
- Inquiry Arousal: stimulate curiosity by posing questions or problems to solve. e.g. The teacher presents a scenario of a problem situation and asks the class to brainstorm possible solutions based on what they have learned in the lesson.
- Variability: incorporate a range of methods and media to meet students' varying needs. e.g. After displaying and reviewing each step in the process on the overhead projector, the teacher divides the class into teams and assigns each team a set of practice problems.

B. Relevance

- Goal Orientation: present the objectives and useful purpose of the instruction and specific methods for successful achievement. e.g. The teacher explains the objectives of the lesson.
- Motive Matching: match objectives to student needs and motives. e.g. The teacher allows the students to present their projects in writing or orally to accommodate different learning needs and styles.
- Familiarity: present content in ways that are understandable and that are related to the learners' experience and values. e.g. The teacher asks the students to provide examples from their own experiences for the concept presented in class.

C. Confidence

- Learning Requirements: inform students about learning and performance requirements and assessment criteria. e.g. The teacher provides students with a list of assessment criteria for their research projects and circulates examples of exemplary projects from past years.
- Success Opportunities: provide challenging and meaningful opportunities for successful learning. e.g. The teacher allows the students to practice extracting and summarizing information from various sources and then provides feedback before the students begin their research projects.
- Personal Responsibility: link learning success to students' personal effort and ability. e.g. The teacher provides written

feedback on the quality of the students' performance and acknowledges the students' dedication and hard work.

D. Satisfaction

- Intrinsic Reinforcement: encourage and support intrinsic enjoyment of the learning experience. e.g. The teacher invites former students to provide testimonials on how learning these skills helped them with subsequent homework and class projects.
- Extrinsic Rewards: provide positive reinforcement and motivational feedback. e.g. The teacher awards certificates to students as they master the complete set of skills.
- Equity: maintain consistent standards and consequences for success. e.g. After the term project has been completed, the teacher provides evaluative feedback using the criteria described in class.

V. WRITING AN INSTRUCTIONAL OBJECTIVE

An effective way to prepare students for the imminent possibility of having to think is by giving them instructional objectives, statements of specific observable actions that the students should be able to perform if they have mastered the course material. An instructional objective has one of the following stems:

- At the end of this [course, chapter, week, lecture], you should be able to *.
- To do well on the next exam, you should be able to *.

Where * is a phrase that begins with an action verb (e.g., list, calculate, estimate, describe, explain, predict, model, optimize, …). The more specific the task, the more likely it is that the students will learn to complete it.

Heinrich and his colleagues suggest that well written objectives have four parts. They call these parts the ABCD's of instructional objectives: [6,12]

A. Audience

The audience is the group of learners that the objective is written for. This is usually written 'the learner' or 'the student' however it could be written as specific as 'The third grade science student'. I suggest that 'less is more'. Make it simple so that the objective does not get too wordy.

B. Behavior

The behavior is the verb that describes what the learner (audience) will be able to do after the instruction. This is the heart of the objective and MUST be measurable AND observable. In addition, these verbs MUST be specific. Verbs such as know, understand, comprehend, appreciate are difficult to measure and are therefore not good choices for objectives.

C. Condition

Conditions are the circumstances under which the objective must be completed. What will the instructor allow the student to use in order to complete the instruction? What equipment or tools can the student have access to such as a calculator, map, the book, class notes, etc. Obviously it would be much more difficult to make calculations without a calculator than with one.

D. Degree

The degree identifies the standard that the learner must meet to reach acceptable performance. In other words, what degree of accuracy does the learner have to meet in order that his/her performance is judged proficient? The degree of accuracy should be related to real-world expectations.

VI. GOALS

An instructional objective is a clear, concise and specific statement of observable student behaviors that can be evaluated at the conclusion of the learning activities and contributes to reaching the goal. Here we describe why we use Instructional Objectives:

- Define the desired outcome of instruction in terms of tasks that student will be able to perform.
- Establish expectations for the student.
- Focus course development and teaching activities on relevant information and skills.
- Provide a clear reason for teaching.
- Provide criteria for eliminating unnecessary information and activities.
- Indicate how success can be measured; provide criteria for student assessment.

VII. EVALUATION

Evaluating learning is essential in the instructional design process. Evaluations help to measure the gap by determining the value and effectiveness of a learning program. It uses assessment and validation tools to provide data for the evaluation. Assessment is the measurement of the practical results of the training in the work environment; while validation determines if the objectives of the training goal were met.

Bramley and Newby identify five main purposes of evaluation: [3,5,12]

1. Feedback: Linking learning outcomes to objectives and providing a form of quality control.
2. Control: Making links from training to organizational activities and to consider cost effectiveness.
3. Research: Determining the relationships between learning, training, and the transfer of training to the job.
4. Intervention: The results of the evaluation influence the context in which it is occurring.
5. Power games: Manipulating evaluative data for organizational politics.

A. Evaluations broad categories

1. Formative

Formative evaluation (also known as internal) is a method of judging the worth of a program while the program

activities are forming (in progress). This part of the evaluation focuses on the process.

They permit the learner and the instructor to monitor how well the instructional objectives are being met. Formative evaluation is also useful in analyzing learning materials, student learning and achievements, and teacher effectiveness.

2. Summative

The summative evaluation (also know as external) is a method of judging the worth of a program at the end of the program activities (summation). The focus is on the outcome. The performance evaluation is a tool to see if the objectives have actually been met, while the impact evaluation is a tool to judge the value or worth of the objectives.

The various instruments used to collect the data are questionnaires, surveys, interviews, observations, and testing. The model or methodology used to gather the data should be a specified step-by-step procedure. It should be carefully designed and executed to ensure the data is accurate and valid.

B. The Four Levels of Training Evaluation

Perhaps the best known training methodology is Kirkpatrick's Four Level Evaluation Model of reaction, learning, performance, and impact: [9]

1. Level One - Reaction

Evaluation at this level measures how the learners react to the training. This level is often measured with attitude questionnaires that are passed out after most training classes. This level measures one thing: the learner's perception (reaction) of the course. Learners are keenly aware of what they need to know to accomplish a task.[10]

2. Level Two - Learning

This is the extent to which participants change attitudes, improve knowledge, and increase skill as a result of attending the program. It addresses the question: Did the participants learn anything? The learning evaluation require post-testing to ascertain what skills were learned during the training.[11]

3. Level Three - Performance (behavior)

Behavior is the action that is performed, while the final result of the behavior is the performance. Performance has two aspects - behavior being the means and its consequence being the end.

4. Level Four - Results

It measures the training program's effectiveness, that is, 'What impact has the training achieved?' These impacts can include such items as monetary, efficiency, moral, teamwork, etc.

VIII. IMPACT AND INFLUENCE

Objectives can cover knowledge and skills as well as attitudes. An emphasis should always be placed on the student's ability to integrate information to solve realistic problems as opposed to the acquisition of information alone. As the developer of instruction, ask the following question before writing your objective, 'What do I want the student to do to demonstrate that s/he has learned?'

Objectives perform three important functions for instructional designers, instructors and students. First, they offer a means of for instructional designer to design appropriate instruction, specifically to select and organize instructional activities and resources that facilitate effective learning. Second, instructional objectives provide a framework for devising ways to evaluate student learning. Third, objectives guide the learner. The rationale is that students will use the objectives to identify the skills and knowledge they must master.

Still in development and testing, objectives identify items that are categorized according to general characteristics: Motivation, Enjoyable, Meaningful, Engaging, Inspiring, Organized, and Balanced.

In addition we categorize these influences to:

• By writing learning objectives, the instructor is selecting the content, developing the instructional strategy, assessing the student's performance and evaluating the instruction.

• A learning objective is a specific statement of observable student behaviors that can be evaluated and contributes to reaching the goal.

• Learning objectives combine action verbs and content to describe the desired behavior.

• An easy way to write a learning objective is to use the A+B+C+D formula.

IX. CONCLUSION

Instructional objectives define target learning goals for an educational experience. A challenge is that learning is not directly observable. This sounds straightforward and obvious, but this phrase can mean many different things, depending on your beliefs about learning and your teaching style. There can be instructional objectives for a degree program, a course, or even a module or learning object within a course. Objectives perform important functions for instructional designers, instructors and students. Whatever evaluation approach is used, there must be a direct relationship between instructional objectives and assessment measures. In this study, how instructional objectives have an impact on e/learning materials and increase both learners' and instructors' motivation, have been focused and described.

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