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Akademischer Rat * Dipl.-Berufspäd. Univ.

Objectives of Learning

A Classification

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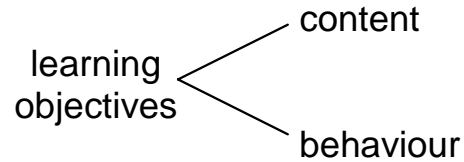
Content

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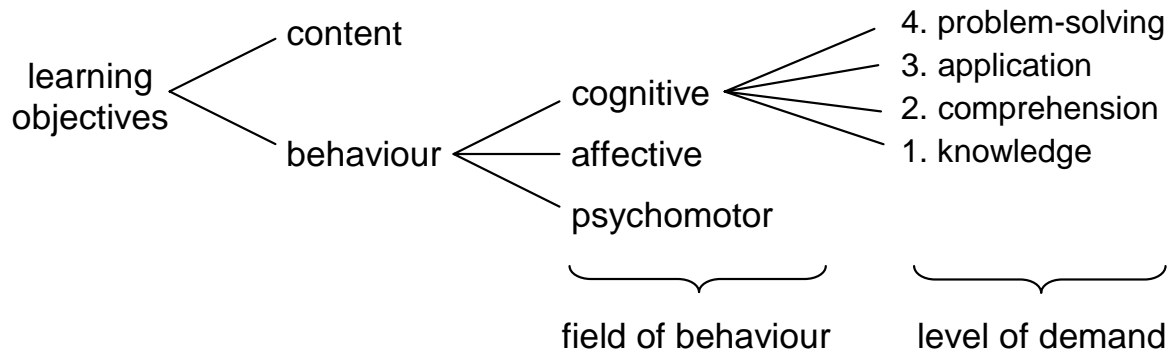www.paed.ws.tum.de/riedl/
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General Definition

A learning objective is a clear and unambiguous description of educational expectations for trainees after they had finished a learning process. Every learning objective consists of two parts:

learning
objectives
— content
— behaviour

A learning objective defines the expected result of a learning process from a content related and behaviour related part

According to the recognition that there is more than one type of learning, behaviour can be differentiated in three domains of educational activities. The three fields are cognitive, affective, and psychomotor. Aimed levels of demand can be differentiated additionally for a specific field. In the overview below, the cognitive field is varied into the levels of demand with increasing complexity.

learning
objectives
— content
— behaviour
— cognitive
— affective
— psychomotor

cognitive
— 4. problem-solving
— 3. application
— 2. comprehension
— 1. knowledge

field of behaviour   level of demand

The different levels of demand in general

Level 1: reproduction

Level 2: reorganisation

Level 3: transfer

Level 4: problem-solving

To sum up it can be said that learning objectives express what trainees should be able to do, in which field of behaviour these abilities have to be shown and on which level of complexity the trainees have to be able to do it.

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The Writing of Learning Objectives

For the educational practice it is necessary to have written objectives for the planning of teaching-learning-processes. There are a number of approaches to writing instructional objectives. Many of them propose writing very specific statements about observable outcomes. While there are advantages and disadvantages to each approach, we will focus on an approach, which is one of the most widely used and perhaps the most inclusive. Behavioural objectives can be written for any of the fields of behaviour (i.e., cognitive, affective, or psychomotor).

Advices for formulating Objectives

1. Identify the terminal behaviour by name; i.e. specify the type of behaviour that provides acceptable evidence that the student has achieved the objectives.

2. Try to further define the desired behaviour; i.e. identify and describe any important conditions under which the student is expected to perform.

3. Specify any acceptable performance criteria; i.e. identify and state the standards to which the student must perform to be acceptable.

Objectives written in behavioural terms

When written in behavioural terms, an objective will include three components:

Student behaviour: skill or knowledge to be gained (e.g., two digit numbers, vocabulary words) and the action or skill the student is able to do (e.g., define, count, label, categorize, analyze, design, evaluate, add, multiply, etc.). A behavioural term is an action verb that indicates what the trainee should be able to do.

Conditions of performance: under what circumstances or context will the behaviour be performed (e.g., in an oral presentation; without the use of notes). The conditions indicate the circumstances under which the action is to take place.

Performance Criteria: how well is the behaviour to be done; compared to what standard (i.e., 80 out of 100; containing all components discussed in class). The standard describes the degree of skill which has to be reached in performing the action.

Some Features of instructional objectives

Concise: at the most, objectives should be one or two sentences in length.

Singular: An objective should focus on one and only one aspect of behaviour.

Describe expected behaviours: An objective should indicate the desired end product, not merely a direction of change or a teacher activity.

Realistic: An objective should focus on observable behaviour, not on teacher illusions or indefinable traits.

Definite Terms (verbs): Terms such as 'write, define, list and compare' have definite meanings, whereas terms such as 'know, understand, and apply' have a multitude of meanings.

Learning Domains according to Bloom's Taxonomy

The Three Types of Learning

Beginning in 1948, a group of educators led by Benjamin Bloom, undertook the task of classifying education goals and objectives. Because there is more than one type of learning, the group identified three domains of educational activities. The three domains are cognitive, affective, and psychomotor. The intent was to develop a classification system for three domains. Work on the cognitive domain was completed in 1956 and is commonly referred to as Bloom's Taxonomy of the Cognitive Domain. The major idea of the taxonomy is that what educators want students to know (encompassed in statements of educational objectives) can be arranged in a hierachy from less to more complex. The taxonomy is presented below with sample verbs and a sample behaviour statement for each level.

Since the work was produced by higher education, the words tend to be a little bigger than we are normally used to. Domains can be thought of as categories.

Cognitive is for mental skills (Knowledge)

Affective is for growth in feelings or emotional areas (Attitude)

Psychomotor is for manual or physical skills (Skills)

That is, after the training session, the learner should have acquired these new skills, knowledge, or attitudes.

This compilation divides the three domains into subdivisions, starting from the simplest behaviour to the most complex. The divisions outlined are not absolutes and there are other systems or hierarchies that have been devised in the educational and training world. However, Bloom's taxonomy is easily understood and is probably the most widely applied one in use today.

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The Cognitive Domain of Learning

The cognitive domain involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. There are six major categories, which are listed in order below, starting from the simplest behaviour to the most complex. The categories can be thought of as degrees of difficulties. That is, the first one must be mastered before the next one can take place.

Level	Key words	Example
KNOWLEDGE Recall or recognition of data, information, ideas, and principles in the approximate form in which they were learned.	defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls, recognizes, reproduces, selects, states.	Quote prices from memory to a customer. Knows the safety rules.
COMPREHENSION Student translates, comprehends, or interprets information based on prior learning.	comprehends, converts, defends, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, interprets, paraphrases, predicts, rewrites, summarizes, translates.	Explain in one's own words the steps for performing a complex task.
APPLICATION Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the workplace.	applies, changes, computes, constructs, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses.	Use a manual to calculate needed material and time for a vocational action.
ANALYSIS Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences.	analyzes, compares, contrasts, diagrams, deconstructs, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, relates, selects, separates.	Troubleshooting by using logical deduction.
SYNTHESIS Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes.	Write a process manual for a college. Design a tool or simple machine to perform a specific task.
EVALUATION Make judgments about the value of ideas or materials.	appraises, compares, concludes, contrasts, criticizes, critiques, defends, evaluates, explains, interprets, justifies, relates, summarizes, supports.	Select the most effective solution for a problem. Explain and justify a new work strategy.

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The Affective Domain of Learning

The taxonomy was developed to organize levels of commitment. As such it could just properly be discussed as a regulatory system issue in the model being presented here. This domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes. The five major categories listed in order are:

Level	Key words	Example
RECEIVING PHENOMENA Being aware of or attending to something in the environment	asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits, erects, replies, uses	Listen to others with respect. Listen for and remember the name of newly introduced people
RESPONDING TO PHENOMENA Showing some new behaviour as a result of experience.	answers, assists, aids, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes	Participates in class discussions. Know the safety rules and practices them
VALUING Showing some definite involvement or commitment.	completes, demonstrates, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works	Is sensitive towards individual and cultural differences (value diversity).
ORGANIZATION Integrating a new value into one's general set of values, giving it some ranking among one's general priorities.	adheres, alters, arranges, combines, compares, completes, defends, explains, formulates, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes	Accepts responsibility for one's behaviour. Prioritizes time effectively to meet the needs of the organization, family, and self.
INTERNALIZING VALUES Acting consistently with the new value	acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, verifies	Revises judgments and changes behaviour in light of new evidence. Values people for what they are, not how they look

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The Psychomotor Domain of Learning

Psychomotor learning is demonstrated by physical skills; coordination, techniques in execution, manipulation, grace, strength, speed, distance, actions which demonstrate the fine motor skills such as use of precision instruments or tools, or actions which evidence gross motor skills such as the use of the body in dance or athletic performance. Development of these skills requires practice. There are various taxonomies of the psychomotor domain. One with primary importance to vocational education is imagined below. The five major categories listed in order are:

Level	Key Words	Examples
Perception The ability to use sensory cues to guide motor activity. This ranges from sensory stimulation, through cue selection, to translation.	chooses, describes, differentiates, distinguishes, identifies, isolates, relates, selects.	Detects non-verbal communication cues. Adjusts the height of the forks on a forklift by comparing where the forks are in relation to the pallet.
Set – Readiness to act It includes mental, physical, and emotional sets (→ dispositions that predetermine a person's response to different situations)	begins, displays, explains, moves, proceeds, reacts, shows, states, volunteers.	Knows and acts upon a sequence of steps in a manufacturing process. Recognize one's abilities and limitations. Shows desire to learn a new process (motivation).
Guided response The early stages in learning a complex skill that includes imitation and trial and error.	copies, traces, follows, react, reproduce, responds	Follows instructions to build a model. Responds hand-signals of instructor while learning to operate a forklift.
Mechanism Learned responses have become habitual and the movements can be performed with some confidence and proficiency.	assembles, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats, manipulates,	Use a personal computer. Repair a leaking faucet. Drive a car.
Complex Overt Response The skilful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, accurate, and highly coordinated performance, requiring a minimum of energy.	The key words are the same as Mechanism, but will have adverbs or adjectives that indicate that the performance is quicker, better, more accurate, etc	Manoeuvres a car into a tight parallel parking spot. Operates a computer quickly and accurately. Displays competence while playing the piano.
Adaptation Skills are well developed and the individual can modify movement patterns to fit special requirements.	adapts, alters, changes, rearranges, reorganizes, revises, varies	Responds effectively to unexpected experiences. Modifies instruction to meet the needs of the learners. Perform a task with a machine that it was not originally intended to do.
Origination Creating new movement patterns to fit a particular situation or specific problem. Learning outcomes emphasize creativity based upon highly developed skills.	arranges, builds, combines, composes, constructs, creates, designs, initiate, makes, originates	Constructs a new theory. Develops a new and comprehensive training programming. Creates a new gymnastic routine.

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