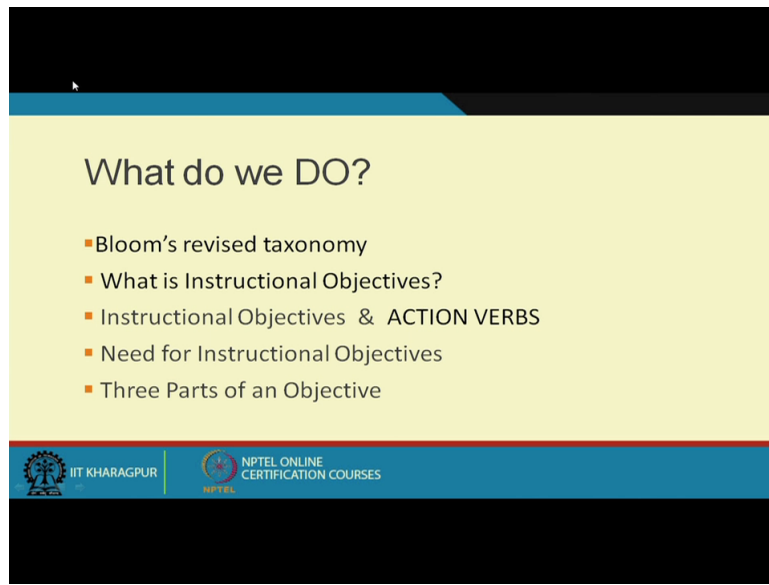


Course on Outcome based Pedagogic Principles for Effective Teaching
Professor Shyamal Kumar Das Mandal
Centre for Educational Technology
Indian Institute of Technology Kharagpur
Module 3
Lecture No 12
Taxonomy (Contd)

(Refer Slide Time: 0:32)



What do we DO?

- Bloom's revised taxonomy
- What is Instructional Objectives?
- Instructional Objectives & ACTION VERBS
- Need for Instructional Objectives
- Three Parts of an Objective

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Good afternoon, today I will tell you the domains of learning and instructional objectives, How to write instructional objective? We mainly focus on the Blooms revised taxonomy, what is the instructional objectives and the action verbs, need for instructional objectives and the three parts of the objective. Now, what is the blooms revised taxonomy? In the last lecture I explained what the bloom taxonomy is but during the 1990's, a former student of bloom, Lorin Anderson, led a new assembly which met for the purpose of updating the taxonomy, hoping to add relevance for 21st century student and teachers. We are focusing to the 21st century student and teachers and for that we will use the revised blooms taxonomy.

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BLOOM'S REVISED TAXONOMY

- During the 1990's, a former student of Bloom's, **Lorin Anderson**, led a new assembly which met for the purpose of updating the taxonomy, hoping to add relevance for 21st century students and teachers.
- The changes occur in three broad categories: terminology, structure, and emphasis.

http://projects.coe.uga.edu/epltt/index.php?title=Bloom's_Taxonomy

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BLOOM'S REVISED TAXONOMY

Original Terms		New Terms
Evaluation	↗	Creating
Synthesis	→	Evaluating
Analysis	→	Analysing
Application	→	Applying
Comprehension	→	Understanding
Knowledge	→	Remembering

(Based on Pohl, 2000, *Learning to Think, Thinking to Learn*, p. 8)

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The changes occur into three broad categories, the terminology, structure and emphasis, first I will explain was that? In the bloom taxonomy knowledge, comprehension, application, analysis, synthesis and evaluation, but in the revised bloom taxonomy just see that knowledge is new name, it is remembering, Comprehension, understanding, Application, applying, analysis analyzing, but what the evaluation level, it comes in the new term it is evaluating. And the synthesis, it goes stop that is the creating level, the new term. So the new is remembering, understanding, applying, analyzing, evaluating and creating, so, what we notice? The term change right, because knowledge became remembering like that and

another thing that knowledge, comprehension, these are the noun form right, but here remembering, understand these are verb form.

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Remembering

- **Remembering** → Retrieving, recognizing, and recalling relevant knowledge from long-term memory

Can students recall information?

Example

- What characters were in the story?
- Recite a poem you have learned.

(Anderson & Krathwohl, 2001, pp. 67-68)
www.niu.edu/facdev/_doc/blooms_presentation.pptx

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You know understand is a verb thing applying it, creating it, so there is a change from the noun form to the verb form. So, remembering, retrieving, recognizing and recalling relevant knowledge from long term memory say, can students recall information? Some example, what characters were in the story? So, it is you have to remembering you are telling that what characters the name of the character. Recite a poem, not explain a poem, and just recite a poem.

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Understanding

- **Understanding** → The learner grasps the meaning of information by interpreting and translating what has been learned.

Can students explain ideas or concepts?

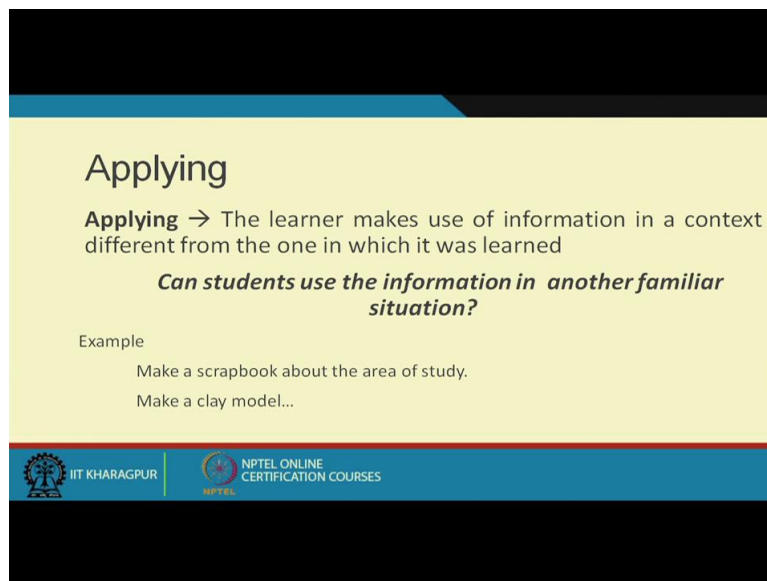
Example

- Write in your own words...
- Write a summary report of the event.

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Understanding, the learner grasps the meaning of information by interpreting and translating what has been learned, can students explain ideas or concept? We will keep as a teacher to keep is in the mind, can they understand it? So, write in your own words, so write the action verb, in your own words you have to explain, write a summary report of the event, so these are the understanding level, not the remembering above that.

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Applying

Applying → The learner makes use of information in a context different from the one in which it was learned

Can students use the information in another familiar situation?

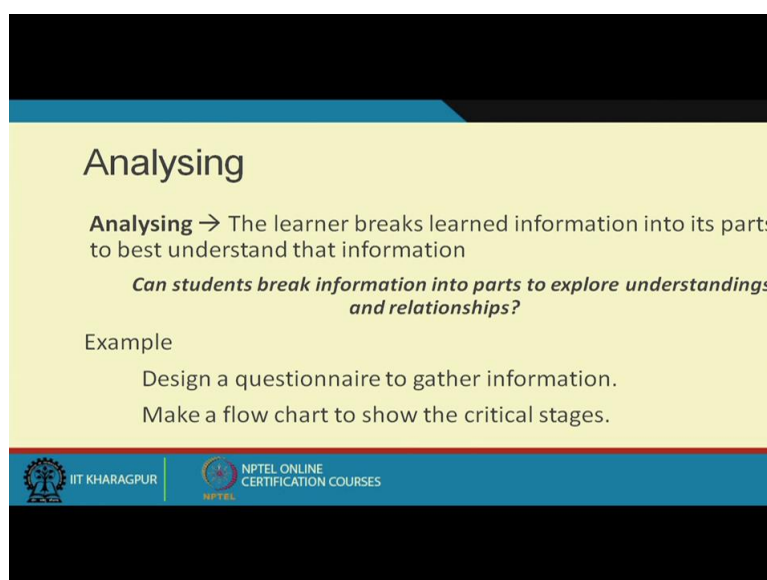
Example

- Make a scrapbook about the area of study.
- Make a clay model...

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Applying means this is the same, just like the old bloom taxonomy. Can students use information in another familiar situation? So, make a scrapbook about the area of the study or make a clay model, is clay model, in that case is a applying it, right.

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Analysing

Analysing → The learner breaks learned information into its parts to best understand that information

Can students break information into parts to explore understandings and relationships?

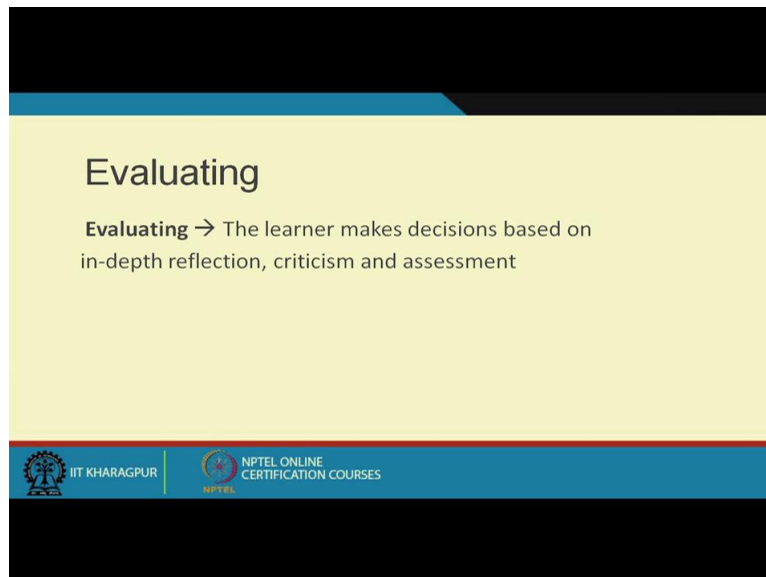
Example

- Design a questionnaire to gather information.
- Make a flow chart to show the critical stages.

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Analyzing: can student break information into parts to explore understandings and relationships? For example, design a questionnaire to gather information. So this is the, they are analyzing it or you have to make a in your research thing make a flowchart to show the critical stages that is the analyzing level.

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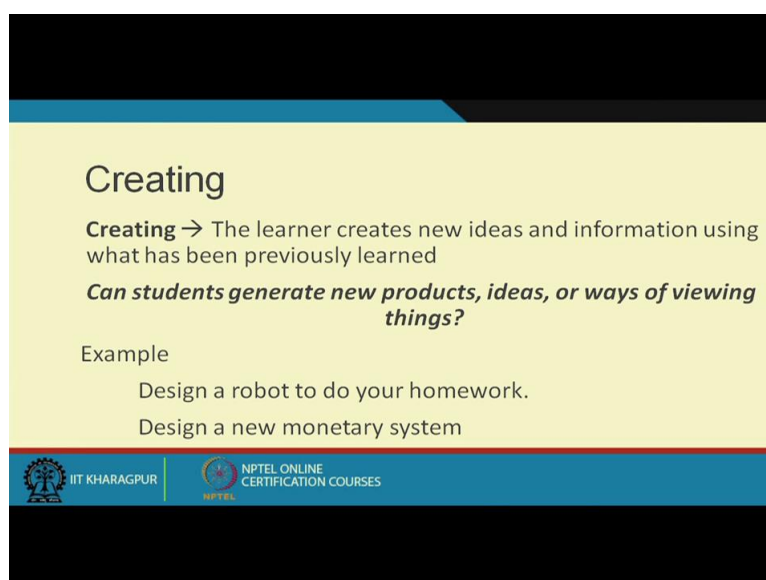
Evaluating

Evaluating → The learner makes decisions based on in-depth reflection, criticism and assessment

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But here, instead of synthesizing, this is evaluating means the learner makes decision based on in-depth reflection, criticism and assessment. Write a half-yearly report, prepare a case study thing so that is in the evaluation level and the we call that is that and that top is the creating.

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Creating

Creating → The learner creates new ideas and information using what has been previously learned

Can students generate new products, ideas, or ways of viewing things?

Example

- Design a robot to do your homework.
- Design a new monetary system

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Creating means the learner creates new ideas and information using what has been previously learned. So, can students generate new products, ideas or ways of viewing things? So, there design a robot to do your homework or design a new monetary system, so this is not the only evaluating, they are not only judge, they are designing it.

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Revised Bloom's Taxonomy of the Cognitive Domain					
Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Articulate Define Duplicate Identify List Name Recall Recognize Reproduce Tell	Calculate Categorize Clarify Classify Compare Contrast Describe Discuss Distinguish Exemplify Expand Explain Illustrate Infer Locate Match Outline Summarize	Carry out Classify Demonstrate Execute Illustrate Implement Practice Solve Use Utilize	Appraise Attribute Compare Contrast Deconstruct Detect Differentiate Discriminate Distinguish Examine Formulate Infer Integrate Organize Parse Relate Select Sequence Structure Test	Appraise Check Coordinate Critique Defend Detect Dispute Judge Monitor Prioritize Rate Reconstruct Select Support Verify	Change Combine Compile Compose Construct Create Design Formulate Generate Hypothesize Improve Invent Plan Predict Produce

So this is the creation component is there, so this is that here all the action verbs in the revised bloom taxonomy of the cognitive level.

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Summary - Bloom's revised taxonomy

- Systematic process of thinking & learning
- Assists assessment efforts with easy-to-use format
- Visual representation of alignment between goals & objectives with standards, activities, & outcomes
- Helps form challenging questions to help students gain knowledge & critical thinking skills

Only so the summary of the revised blooms taxonomy is that it is a systematic process of thinking and learning, what you are thinking and what you are learning, the revise blooms is

the systematic process. So, it assists if the process name assist, it is help you for the assessment efforts to easy-to-use format.

Visual representation of alignments between goals and objectives with standards, activities and outcomes, was the objective clear then outcome also clear. Helps from challenging questions to help students gain knowledge and critical thinking skill and it assists in development of goals, objectives and lesson plants. Lesson plant what to to go to before to teaching the class, the lesson plant, these objective and this using the bloom taxonomy or blooms revised taxonomy what I want from the learner if I explain it then it is easy for me to use the lesson plant right.

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Instructional Objectives
A statement of something that students should be able to
DO
after receiving instruction

Instructional Objectives have to be
SPECIFIC and **MEASURABLE**

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So, instructional objective is that how using the taxonomy we are writing the instructional objectives. There this is the main thing here; a statement of something that student should be able to do after receiving instruction so, the do component is very important what they know is not what they can do it, right, so instructional objective, it is very specific and measurable.

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Instructional Objectives

- Objectives are specific, outcome based, measurable, and describe the learner's behaviour after instruction.

Specific- Objectives are **very specific**. This means that they should describe precisely what the learner is expected to do

Outcome based- This means that the objective is going to state what the learner should be able to do *after* the instruction is complete. The process of how the instruction happens is not considered in an objective.

<http://edtech2.tennessee.edu/projects/bobannon/objectives.html>

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Objectives are specific, outcome based, measurable and describes the learner's behaviour after instruction. After instruction was that is the objective you have write very specific objective so that learner can clearly understand that my teacher, he wants this. Specific means objectives; this means that they should describe precisely what the learner is expected to do. When as a teacher when you will write the objective in that case it should be very specific that learner will do this. Outcome based, already I explained outcome based, so this means that objective is going to state what the learner should able to do after instruction is complete. So the process of how the instruction happens is not considered is under objective, so that means what the outcome, it should specify it in the instructional objective.

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Instructional Objectives

Measurable - This means that objectives should describe learning outcomes that can be measured; objectives should be seen or heard.

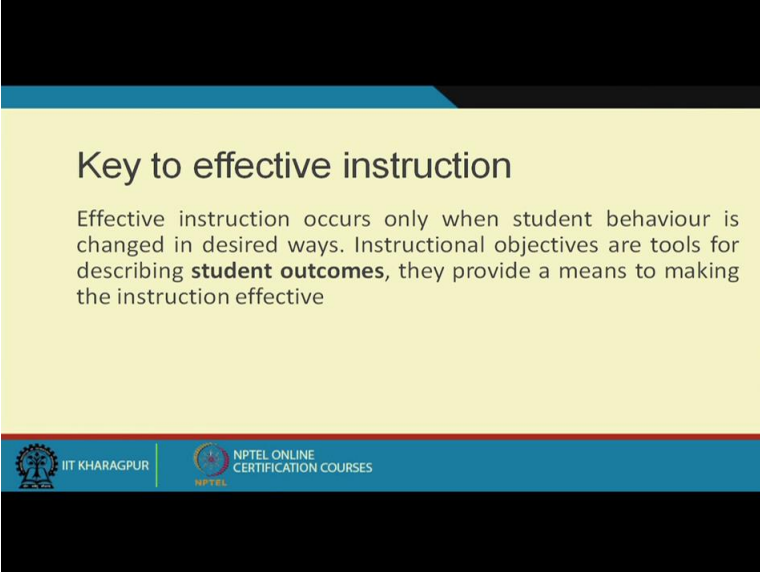
Describe student behaviour- Objectives **describe student behaviours**. This means that objectives should relate what the student should be able to do after the instruction

<http://edtech2.tennessee.edu/projects/bobannon/objectives.html>

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The third component is measurable that this means that objective should describe learning outcome that can be measured “feel” verb or “appreciate” verb is weak thing, “feel, understand” it is also weak concept why? You may understand I may not. Feel, you may feel I may not, right. So, not measurable means it should be measurable feeling is not the measurable things, right. So, the describe students behaviour, the objectives that describes students behaviour, this means that the objective should relate what the learner should be able to do after the instruction, right, so that students behaviour we focusing the learner.

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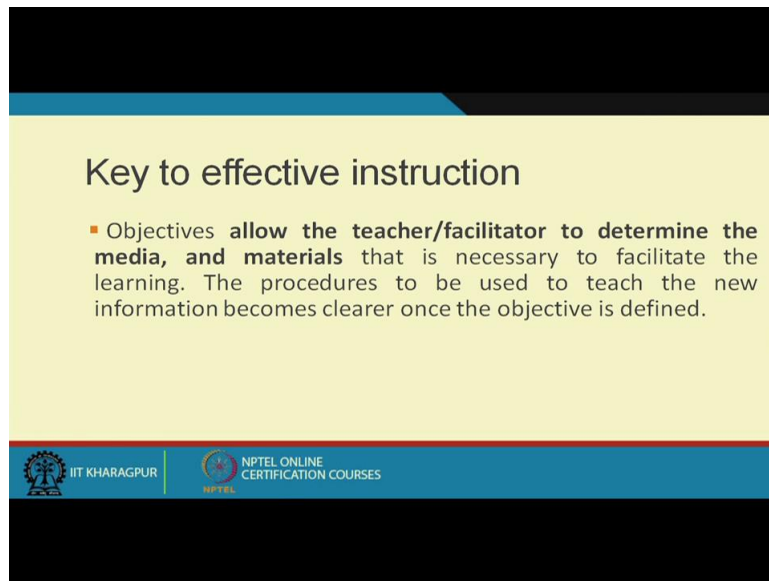
Key to effective instruction

Effective instruction occurs only when student behaviour is changed in desired ways. Instructional objectives are tools for describing **student outcomes**, they provide a means to making the instruction effective

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Key to effective instruction, effective instructions occurs only when student behaviour is changed in desire way. Instructional objectives are nothing but the tools for describing the student outcomes; they provide a means of making the instruction effective. So, objectives tell students to what is expected of them, what you expect so that you what you want from the you suppose, you expect that your student can analyze something right, but you in the question paper you are, in the evaluation (10:40) judge this and this type of this not possible, they can only analyze right. So, if it is the objective level it should be clear what you want I want my learner up to the analyzing level, but not in the synthesis or in that creation in that levels. So, they eliminate the guess work because the expectations are clearly defined, right.

(Refer Slide Time: 11:12)



Key to effective instruction

- Objectives **allow the teacher/facilitator to determine the media, and materials** that is necessary to facilitate the learning. The procedures to be used to teach the new information becomes clearer once the objective is defined.

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Objectives allow the teacher to facilitator to determine the media and materials that is necessary to facilitate the learning. The procedures to be used to teach the new information become clearer once the objective is clear yes, when the objective is clear then what will be the outcome. Evaluation and if the objective is clear if you then it is easy for us to create your evaluation paper your question paper, so evaluation is always based on the instructional objectives. We are actually promoting self-learning, the students they from the media, from different they know they can read on their own, but what they have to achieve if the objective is clear, okay they will learn on their own and they can understand but the teacher want this type of questions or that the evaluation everything is very easy. So, (deter) the evaluation determining the objective classification will assist you in determining the appropriate method of evaluation.



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Basic Characteristics of Instructional Objectives

Action Oriented Statements – describing what is to be achieved by the learner.

Related to **intended Learning Outcomes** - NOT - the process for achieving those outcomes.

Intended Learning Outcomes (ILOs) are student centered and describe the intentions for your students' learning; they specify what students should know and be able to do by the end of the program.

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Basic characteristics of the instructional objective is a action oriented statement. Describing what is to be achieved by the learners. So, it is related to the intended learning outcome not the process for achieving the outcome, so here this a new term that is the intended learning outcome. These are the students centered and describe the intentions for your students learning, they specify what students should know and what I mention be able to do, right by the end of the program.

So, after end of the program they after 40 hours of lecture after end of the program, they will do this, so that in the course suppose in the course, there are some modules another modules will the sub units, actually in the software framework I will explain that, in the course what the objective of the course if you write it specifically then, it is easy for the learner okay in this course the objective is this I have to achieve it. In each module or each unit we should specify unit means one hour lecture, some objective if I clear so after one hour class okay, the objective is this, I have to achieve those objectives, as a learner I will think accordingly, but as a teacher the objective we should precisely we should write it very clearly, right.

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Intended Student learning Outcome

- They identify what students should know and be able to do as a result of completing their particular degree programs.
- Statements of **intended learning outcomes** should clearly articulate the intended knowledge, skills, abilities, and competencies that characterize the essential learning required of a graduate of a program of study.

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Intended student learning outcome, they identify what students should know and be able to do as a result of completing their particular degree programs. So, statements of intended learning outcome should clearly articulate the intended knowledge, skills, abilities and competencies that characterize the essential learning required of a graduate of a program of study, right.

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Basic Characteristics of Instructional Objectives

Specific & measurable – NOT – broad and intangible
(understand algebra / know your enemy / be able to internalize a sense of confidence)

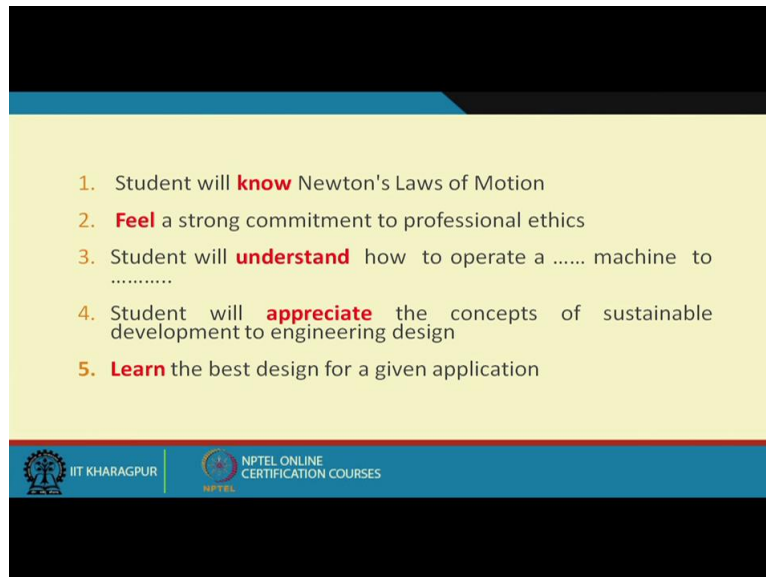
Concerned with the “**learner**” – rather – than the “teacher”.

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Now, the basic characteristics of instructional objectives I already mentioned, it is specific and measurable, not broad and intangible, understand algebra, know your enemy you may not you may, be able to internalize a series of confidence, so it is concentrate to the learner rather

than the teacher, right because feels students enough so, we are totally learner centric. The total outcome base learning is the learner centric approach.

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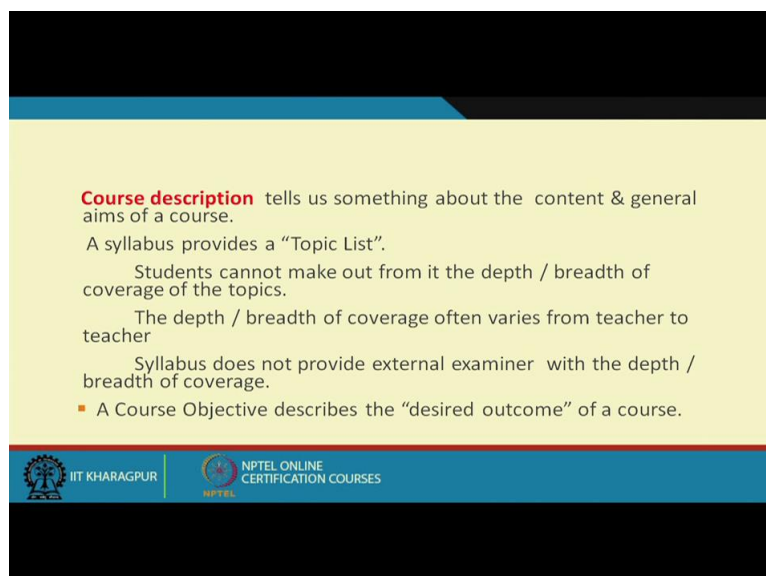


1. Student will **know** Newton's Laws of Motion
2. **Feel** a strong commitment to professional ethics
3. Student will **understand** how to operate a machine to
4. Student will **appreciate** the concepts of sustainable development to engineering design
5. **Learn** the best design for a given application

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Student will know Newton's law of motion, know is a wrong term you may I may not. Feel understand, appreciate, learn is better avoid this words these are not the exact action verbs. So, now was that action verb now we have to know what the action verb. Instructional objective should not be formulated with vague statement. The student understand/ appreciate I mentioned that, so instructional objectives are to be formulated with the help of the action verbs. So what identify assess, list, analyze, design, compare very specific and it is measurable.

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Course description tells us something about the content & general aims of a course.
A syllabus provides a "Topic List".
Students cannot make out from it the depth / breadth of coverage of the topics.
The depth / breadth of coverage often varies from teacher to teacher
Syllabus does not provide external examiner with the depth / breadth of coverage.

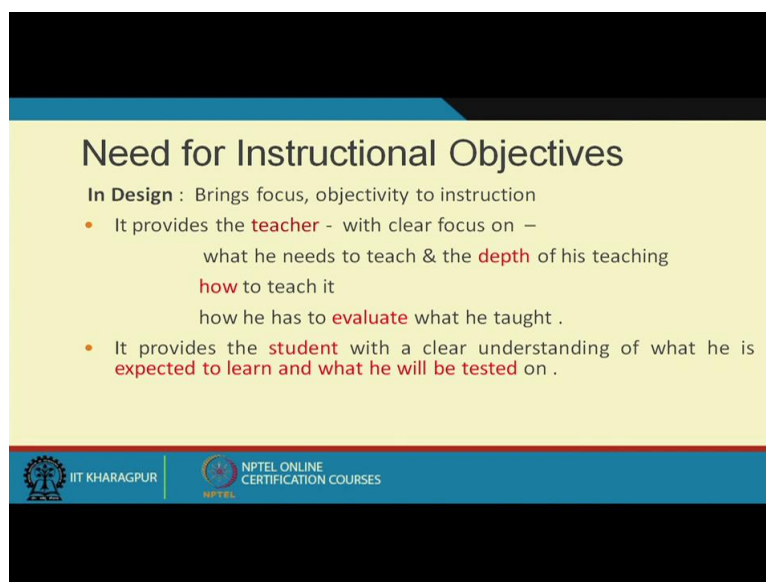
- A Course Objective describes the "desired outcome" of a course.

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Course description tells us something about the content, any course description and general aims of the course, but our syllabus provides a Topic list, students cannot make out its depth in the in any course how much that how the depth and breadth, the depth and breadth coverage, varies from teacher to teacher suppose A teacher is teaching one course and B teacher is teaching the same course. One teacher in some topics it goes not in the breadth but it goes he goes to the depth right, another we know breadth but not in the depth. So, this in the if you write the instructional objectives so course description, it is not clear but when you write the instructional objectives, in that case how much you should specify that, then it is easy for the learner to know that okay. In this topic it will go the depth part is very important right.

So, syllabus does not provide that so provide external examiner with the depth and breadth and in that case if the instructional objective is clear, in that case the industry people also can know that the okay, this student he knows up to this level because the objective written by the teacher not the syllabus things. So, that is why this instructional objective is very-very important, our course objective describes the desired outcome of the course.

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Need for Instructional Objectives

In Design : Brings focus, objectivity to instruction

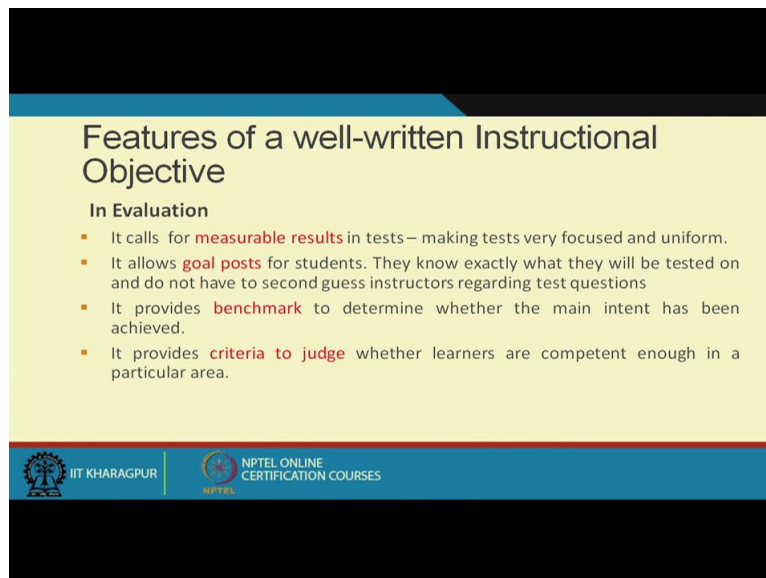
- It provides the **teacher** - with clear focus on –
what he needs to teach & the **depth** of his teaching
how to teach it
how he has to **evaluate** what he taught .
- It provides the **student** with a clear understanding of what he is **expected to learn and what he will be tested** on .

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So, in planning so need for instructional objectives in planning, it guides selection of the proper tools for the instruction, Mode of teaching g lecture, demonstration, hands-on what the learner needs to achieve after the instruction. Once objective are fixed, instructor is free to attain the goal in his own way the learner can, it allows a consistent results from learners across instruction across years.

So, in the planning, to planning the instructional objective is very important. Now, to design it first in the planning component instruction (18:37) before that teaching you have to plan. The second is to design thing, in design, it focus objectivity to instruction. It provides the teacher with clear focus on what he needs to teach and the depth of his teaching, right. In the design how to teach it, how he has to evaluate, it provides the students with a clear understanding of what he is expected to learn and what he will be tested on clear. I mention the future employer of such students with clear idea of exactly what the students has learned from the course. So, you can understand right, the design that is why from the design point of you there is a great need of the instructional objectives and the last point you say the evaluation.

(Refer Slide Time: 19:44)



The slide features a yellow background with a blue header and footer. The title 'Features of a well-written Instructional Objective' is in bold black text. Below it, the section 'In Evaluation' is followed by a bulleted list of four points. The footer contains the logos for IIT Kharagpur and NPTEL Online Certification Courses.

Features of a well-written Instructional Objective

In Evaluation

- It calls for **measurable results** in tests – making tests very focused and uniform.
- It allows **goal posts** for students. They know exactly what they will be tested on and do not have to second guess instructors regarding test questions
- It provides **benchmark** to determine whether the main intent has been achieved.
- It provides **criteria to judge** whether learners are competent enough in a particular area.

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It calls the measurable results in tests making tests very focused and uniform. It allows goal posts for students, right. They know exactly what they will be tested goal post all and do not have the second guess instructors regarding the test questions. It provides a benchmark to determine whether the main intent has been achieved or not. It provides the criteria to judge whether learners are competent enough in a particular area, media. So in the evaluation if the learner is competent it is easy for us. So, the thing is that you write the instructional objective is very important.

(Refer Slide Time: 20:41)

The slide, titled "Three Parts of an Objective", features a central diagram of a blue triangle. Inside the triangle, a green circle is labeled "Task or observable action". Below the circle, the text "Conditions or Environment" is written. At the base of the triangle, a double-headed arrow is labeled "Standard" with the subtitle "or how well it must be performed" below it. To the right of the triangle, a bulleted list identifies three components: "The Performance Component", "The Condition Component", and "The Criterion Component". At the bottom of the slide, a URL is provided: http://www.nwlink.com/~%E2%80%89Donclark/hrd/isd/develop_objective.html. The footer includes the logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES.

Now, to write the instructional objective, there are three components, one is the performance component, one is the condition component and in the criterion component. First was that, performance component is that what the learner have to perform, what the learner have to do that is the performance component.

Condition means under what condition they have to perform, so that is the condition component. Criterion component is up to what level that is the criterion component. So, when you will write the instructional objective we should first the performance component that is very important what the learner have to perform, not the feel and this things understand only describe some that is the only apply do this things so, that is the performance. Under what condition, condition is component and up to what level you have to specify that because in the criterion you are specifying up to this level but in the evaluation properties you are thinking that they will do that level that is not fare, okay.

(Refer Slide Time: 21:54)

The Performance Component

Performance describes what the learner will be doing when demonstrating that he/she has reached the objective

- What should the learner be able to do?

Performance may be “overt” – where it can be readily seen / heard (dance / draft a report).

Performance may be “covert”, i.e., is not a visible performance.

Such performances often describe something a learner can “BE” instead of something a learner can “DO”.

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So, performance component describe the learner will be doing when demonstrating he or she has reached the objective what should the learner be able to do. Performance may be overt where it can be readily seen or heard suppose dance thing or drafter report, right. So, it is a overt but it can be overt which is not visible performance, right. So, such performance often describes something a learner can “BE” instead of something a learner can “DO”, right, so this is the performance part.

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The Condition Component

- The Conditions component of an objective is a description of the circumstances under which the performance will be carried out.
- It also includes a description of what will be available to learners when they perform the desired behaviour.

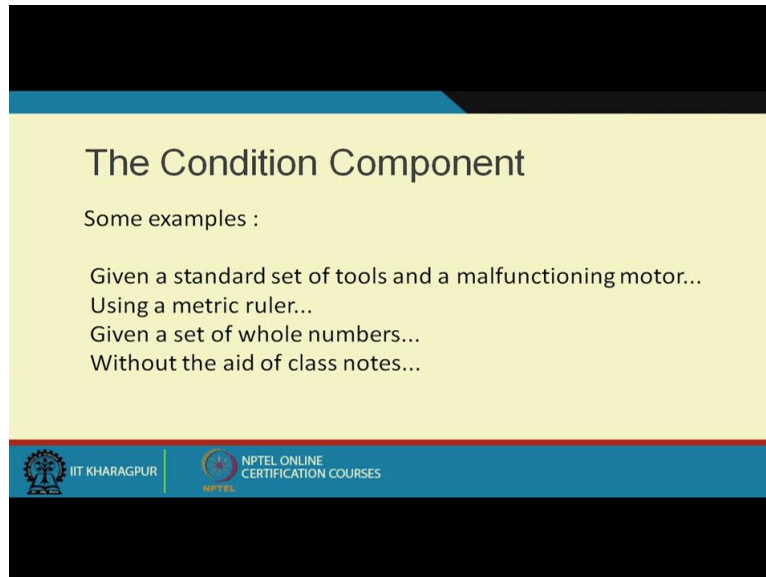
For example: Travel from Kolkata to Delhi in 2 h
In an aircraft, travel from Kolkata to Delhi in 2 h

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Condition I mention was the condition; the condition component of an objective is the description of the circumstances under which the performance will be carried out. Suppose, it also includes, a description of what will be available to the learner when they perform the

desired behaviour, suppose example, travel from Kolkata to Delhi in two hours. In an aircraft if I mention so that is the component right, in an aircraft travel from Kolkata to Delhi in two hours, so that thing you should specifying what condition, right.

(Refer Slide Time: 23:25)



The slide has a yellow background with a blue header and footer. The title 'The Condition Component' is centered in a dark font. Below the title, the text 'Some examples :' is followed by four bullet points: 'Given a standard set of tools and a malfunctioning motor...', 'Using a metric ruler...', 'Given a set of whole numbers...', and 'Without the aid of class notes...'. The footer contains the logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES.

The Condition Component

Some examples :

- Given a standard set of tools and a malfunctioning motor...
- Using a metric ruler...
- Given a set of whole numbers...
- Without the aid of class notes...

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And the last suppose give some examples, given standard set of tools and a manufacturing motor to that. Using a metric ruler, given a source set of whole numbers like that we should specify it. The criterion component I mention up to what level, the final component of an effective objective is the criterion. So, the criterion is the description or the criteria for acceptance of a performance as sufficient that is help to gauge the quality of performance. This component tells the learner I mention how often, how well, how much, how will, you know, so his performance this is the criterion component.

(Refer Slide Time: 24:18)

The Criterion Component

Some common criteria :

- Speed / time limit on the performance
- Minimum marks for passing / grades
- Level of accuracy (within 0.5% accuracy)
- Quality of the performance (information is factual / pertinent / treatment is courteous)

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Speed or the time limit of the performance, minimum marks for passing this is the you know, these are the level accuracy with a 0.5% in accuracy so that is the criterion component.

(Refer Slide Time: 24:33)

Examples of Instructional Objectives

- Write a customer reply letter with no spelling mistakes by using a word processor.
 - Performance Criteria : Write a customer reply letter
 - Criterion Criteria: with no spelling mistakes
 - Condition Criteria : using a word processor

http://www.nwlink.com/~%E2%80%89Donclark/hrd/isd/develop_objective.html

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Example, write a customer reply letter with no spelling mistakes by using a word processor. So, what you have to perform? Write a customer reply letter right. Now what is the criteria; with no spelling mistakes and condition using a word processor.

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Examples of Performance Objectives

- Copy a table from a spreadsheet into a word processor document within 3 minutes and without reference to the manual.
Observable Action: Copy a table from a spreadsheet into a word processor document
Measurable Criteria: within 3 minutes
Conditions of Performance: without referencing the manual

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Suppose here copy a table from a spreadsheet into a word processor document within 3 minutes and without reference to the manual. What is the objectible action; copy a table from a spreadsheet into a word processor document? Now, what is measurable criterion; within 3 minutes. What is the condition of the performance; without referencing the manual?

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Examples of Performance Objectives

- Smile at all customers, even when exhausted, unless the customer is irate.
Observable action: Smile

http://www.nwlink.com/~%E2%80%89Donclark/hrd/isd/develop_objective.html

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Smile at all customers even when exhausted unless the customer is irate, okay. So, the observable action you have to smile. Measurable criteria at all customers, condition, even when exhausted and variables unless the customer is irate. So, this is (I) now in each subject suppose the thermodynamics in each subjects, the teachers have to write the instructional the teachers instructional objectives using these condition, criterion and performance component

and when you use the performance component that time you have to keep in mind the bloom taxonomy and the action verbs, whether it is in the knowledge level, comprehension level, application level, analysis, synthesis or evaluation in which level that in the performance part these bloom taxonomy and action verbs is very important, okay.

So, in the next lecture I will explain you, how to write the instructional objective is clear. Now using the software framework how we can write the instructional objectives I will show the software framework developed by IIT Kharagpur, Thank you.