OBE-Student Learning Outcomes

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Outcomes Based Education (OBE)

OBE :Restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of **higher order skills** (Tucker, 2004).

Aim : to facilitate desired changes within the learners, by increasing **knowledge**, developing **skills** and/or positively influencing **attitudes, values** and **judgment**. first determine what needs to be achieved.

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Conti…

OBE is an educational theory that bases each part of an educational system around goals (**outcomes**).

Each student should have achieved the goal by the end of program.

Not defined specified style of teaching or assessments should all help students achieve the specified outcomes

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Institutional vision & Mission

Program Outcomes

Student Learning Outcomes

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Purpose of Developing Outcomes

- Modify, outline , and improve quality of programs.

- Assist in meeting accreditation requirements, models of best practices,

- To meet national and global benchmarks

Deciding on the program outcomes

- Why are you offering this program?

- Why are students enrolling in this course?

- What knowledge and/or skills will students gain from taking this course?

Learning objectives vs. outcomes

Learning Objectives : Describe what a teacher **needs to teach** .

Ex: Students will **understand** the X and Y concepts

Learning Outcomes : what students to know and or be able to do as a result of completing a particular degree or course or certificate program

Ex: Students will be able to **choose suitable** X and Y for respective domain .

Student learning outcomes(SLOs)

- Levels (course, program, institution) – What the students to **know ,think** and **able to do** when they complete a course, major program of study, degree?

- **Institutional Level**: From our campus the graduate can **apply quantitative** reasoning to real world

- **Program Level**: what students should be able to know, think, or do across all courses within a curriculum.

Student learning outcomes(SLOs)

□ *Course* level : student learning outcomes are more specific and describe achievement expected in a particular course.

Student Learning Outcomes

Statements

To specify what learners will know, think ,be able to do or be able to demonstrate when they complete or participate in a program/activity/course/project.

Outcomes are expressed as knowledge, abilities/skills, attitudes or values.

Student Learning Outcomes

Learning outcomes relate to the mission and goals of your college and/or your department or program.

Learning outcomes define what the graduate should know and be able to do at the end of your program.

Characteristics of SLOs

□ They should be:
- Based on POs   Realistic
- Student centric   Specific
- Action oriented   Cognitively appropriate
- Measurable
- Meaningful
- Understandable
- Achievable

Why are we doing this?

- ☐ Annual **assessment** as the foundation for program review.

- ☐ Program review (assessment) are required by **NBA** or other **accreditation body**.

- ☐ NBA is our accrediting body. If we are not accredited, most students cannot obtain admissions in **world class universities IN FUTURE**.

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How to Write PSLOs

- 5–7 program student learning outcomes(courses or units).

- Identify 2 appropriate assessment strategies for each learning outcome (at least one direct)

- Develop a scoring guide/rubric

- Identify the criteria for success

- Identify the course/s where assessment will occur

- Using words such as "understand," "demonstrate," or "appreciate" as they don't convey clear expectations.

- Use Bloom's Taxonomy to find appropriate words for your LOs:

Bloom's Taxonomy

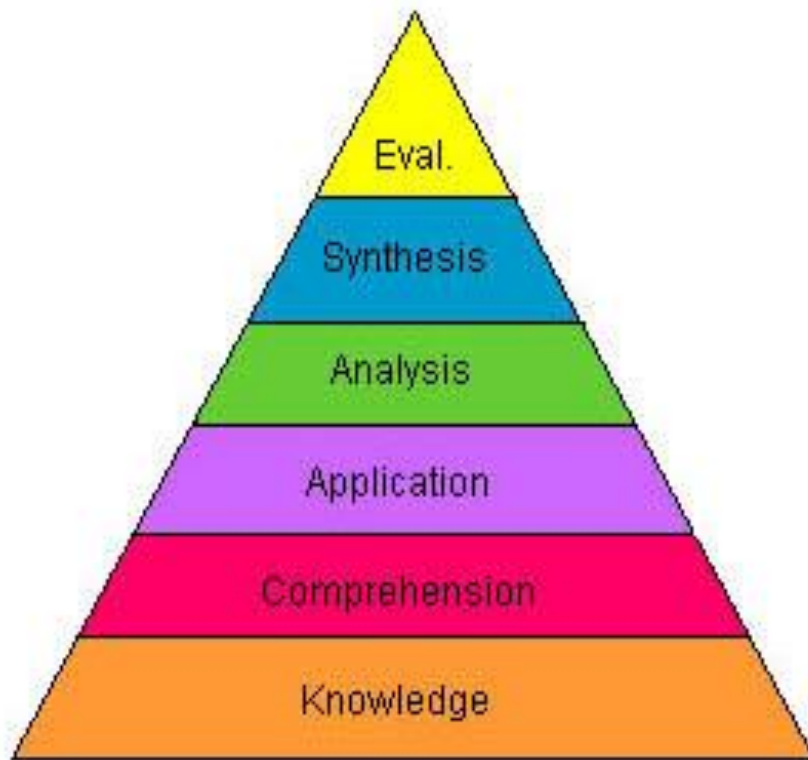- ## Cognitive skills

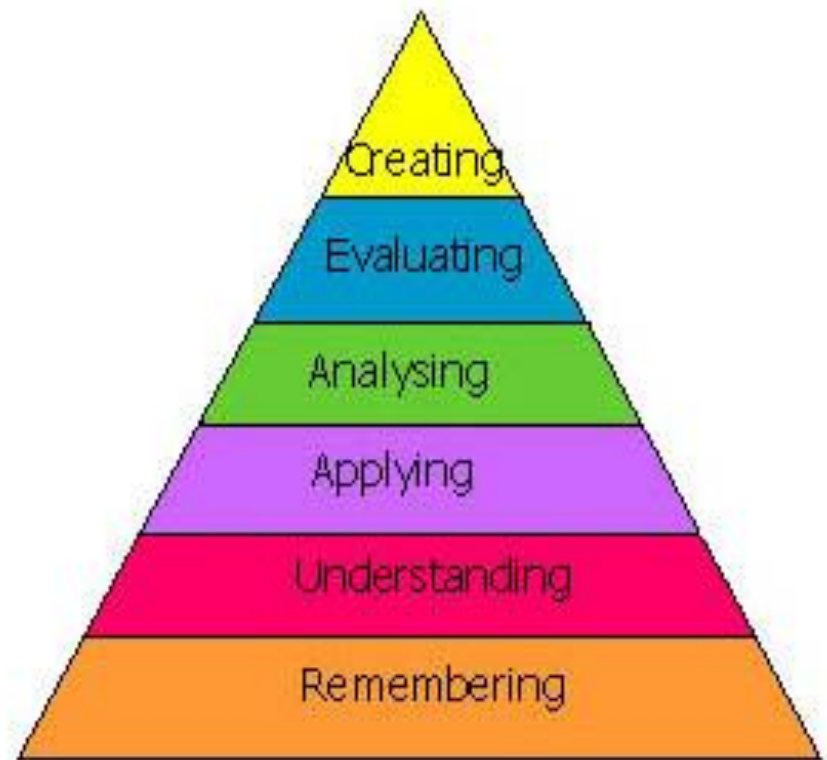 - It involves knowledge and the development of intellectual skills.

  - There are six major categories based on degrees of difficulties, which are listed in order in next slide , starting from the simplest behavior to the most complex.

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Cognitive skills

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Knowledge

Recalling previously learned information such as facts, terminology, rules, etc.

Answers may be memorized

Students can **list** the major theoretical approaches of the discipline (**knowledge**).

Arrange	Enumerate	Name	Recite	Reproduce
Collect	Examine	Order	Recognise	Select
Count	Find	Outline	Recollect	Show
Define	Identify	Present	Record	State
Describe	Label	Point	Recount	Tabulate
Draw	List	Quote	Relate	Tell
Duplicate	Match	Recall	Repeat	Write

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Comprehension

- Ability to **understand** the meaning of material.
- Answers must be in the student's own words using terminology appropriate to the material.
- Students can **describe** key theories, concepts, and issues for each of the major theoretical approaches (**comprehension**)
- **Ex: Differentiate** between Engineering and Technology

Associate	Decode	Explain	Indicate	Restate
Change	Defend	Express	Infer	Rewrite
Clarify	Describe	Extend	Interpret	Review
Classify	Differentiate	Extrapolate	Locate	Select
Compute	Discriminate	Generalise	Paraphrase	Specify
Construct	Discuss	Give examples	Predict	Solve
Contrast	Distinguish	Identify	Recognise	Summarise
Convert	Estimate	Illustrate	Report	Translate

Application

- Requires recognizing, identifying, or **applying** a concept or principle in a **new situation** or solving a **real life** problems.

- Students can **apply** theoretical principles to solve real-world problems (**application**).

Add	Compute	Experiment	Operate	Select
Apply	Construct	Find	Organise	Show
Assess	Demonstrate	Graph	Plot	Simulate
Calculate	Develop	Illustrate	Practise	Sketch
Change	Discover	Interpret	Predict	Solve
Choose	Divide	Interview	Prepare	Subtract
Classify	Dramatise	Manipulate	Produce	Transfer
Collect	Employ	Map	Relate	Translate
Complete	Examine	Modify	Schedule	Use

Analysis

- Ability to **break (top down)** material down into its component parts and to understand its underlying structure

- May require students to compare and contrast or explain how an example illustrates a given concept or principle.

- Require students to identify logical errors or to **differentiate** among facts, opinions, assumptions, hypotheses and conclusions

- Expected to **draw relationships** between ideas

- Differentiate, estimate, diagram

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Analysis

□ Students can **analyze** **strengths** and **limitations** of each method or technique for understanding specific phenomena (**analysis**).

Ex: Analyze a tennis player's game statistics with data mining techniques and provide effective feedback.

Analyse	Connect	Differentiate	Group	Point out
Appraise	Contrast	Discover	Identify	Question
Arrange	Criticise	Discriminate	Illustrate	Relate
Break down	Debate	Distinguish	Infer	Recognise
Calculate	Deduce	Divide	Inspect	Separate
Categorise	Detect	Draw conclusions	Investigate	Simplify
Classify	Determine	Examine	Order	Subdivide
Compare	Develop	Experiment	Outline	Test

Synthesis

- **Opposite** of Analysis (**bottom up**)

- Ability to **combine parts** to form a new whole

- To synthesize a variety of elements into an original and significant whole.

- Produce something **unique** or original

- Solve some **unfamiliar problem** in a unique way

- Combine, create, formulate, construct

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Synthesis

Students can **combine** theoretical approaches to explain complex phenomena (**synthesis**).

Ex: **Produce** a strategic plan for a small manufacturing business.

Argue	Construct	Generalise	Order	Reconstruct
Arrange	Create	Generate	Organise	Relate
Assemble	Design	Group	Originate	Reorganise
Categorise	Develop	Integrate	Plan	Revise
Collect	Devise	Invent	Prepare	Rewrite
Combine	Establish	Make	Prescribe	Set up
Compile	Explain	Manage	Propose	Summarise
Compose	Formulate	Modify	Rearrange	Synthesise

Evaluation

- Ability to **evaluate** a total situation

- To **judge** the value of material for a certain purpose

- Combining elements of all the other categories and also **value judgments** based on defined, fixed criteria.

- Judge, critique, justify, discriminate

Evaluation

□ Students can select the theoretical approach that is most applicable to a phenomenon and explain **why they have selected** that perspective (**evaluation**).

Ex: Analyse and <u>evaluate</u> the theories and applications underlying multiple data collection techniques used in data mining.

Appraise	Consider	Discriminate	Monitor	Score
Ascertain	Contrast	Estimate	Predict	Select
Argue	Convince	Explain	Persuade	Standardise
Assess	Criticise	Evaluate	Rank	Summarise
Attach	Critique	Grade	Rate	Support
Award	Decide	Interpret	Recommend	Test
Choose	Defend	Judge	Relate	Validate
Compare	Detect	Justify	Resolve	Value
Conclude	Determine	Measure	Revise	Verify

Bloom's Taxonomy

- Affective Domain
  - It deals with things emotionally, such as feelings, values, appreciation, motivations, and attitudes.

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Affective Domain: Example

- Graduates will be able to evaluate educational research critically and **participate** in the research community and social relevant problems.

- **Display** a professional commitment to ethical practice.

- **Resolve** conflicting issues between personal beliefs and ethical considerations

Psychomotor Domain

- The psychomotor domain includes physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution.

Prof.S.V

Psychomotor Domain

- **Motor skills** are **motions** carried out when the **brain, nervous** system, and **muscles** work together.

- **motor skills** are small movements — such as picking up **small objects** and holding a spoon — that use the small muscles of the fingers, toes, wrists, lips, and tongue.

Psychomotor Domain: **Examples**

- **Perform** an 'exercise to music' routine that includes a warm-up, developmental and cool-down phase.

- **Construct** and test a simple circuit using a digital multimeter, a DC power supply and a 'breadboard'.

Example 1

- Students will be able to use **Excel**.

- Given a sample dataset, students will use **Excel** to create a spreadsheet that incorporates simple mathematical formulas.

Example 2

- Students will **analyze** global political systems.

- Students will **analyze** 20th century western democracies and responsibilities of citizens in those democracies.

Computer Science :Student Outcomes

- **Impart an understanding of the basics of our discipline :**Each graduated student should be able to:

- **Apply** fundamental principles and methods of Computer Science to a wide range of applications

- **Design**, correctly implement and document solutions to significant computational problems

- **Develop proficiency in the practice of computing.** Each graduated student should be able to:

- **Formulate** solutions to computing problems

- Analyze and compare alternative solutions to computing problems

- Design and implement effective solutions to computing problems

- **Apply** sound principles to the synthesis and analysis of computer systems

Data structures; :Student Outcomes

- **Understand** the basic properties of various data structures

- **Identify** the strengths and weaknesses of different data structures

- Ability to **Design and employ** appropriate data structures for solving computing problems

- Ability to **Analyze and compare** the efficiency(time and space) of algorithms

- Ability to **design and implement** efficient algorithms for solving computing problems

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Data structures :Student Outcomes

- ☐ Students develop knowledge of basic data structures for storage and retrieval of ordered or unordered data.

- ☐ Students develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching, and sorting of each data structure.

- ☐ Students learn to analyze and compare algorithms for efficiency using Big-O notation.

Who sets the SLOs

- Faculty Who teach in the degree program .

- Experts in the discipline

How do we decide the SLOs

- Regular faculty meetings.

- Expert facilitator.

- Assessment workshop.

Why Assess?

- Improves students' learning.

- Identifies instructional, course, or assignment challenges.

- Ensures grading is reflective of students' learning towards course outcomes .

- Makes grading more systematic and objective.

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The Assessment Process: Plan-Do-Review

1. Establish PEOs and missions
For programs

6. Use results to refine instruction (close the feedback loop)

2. Write Student Learning Outcomes (SLO's)

5. Evaluate assessment results

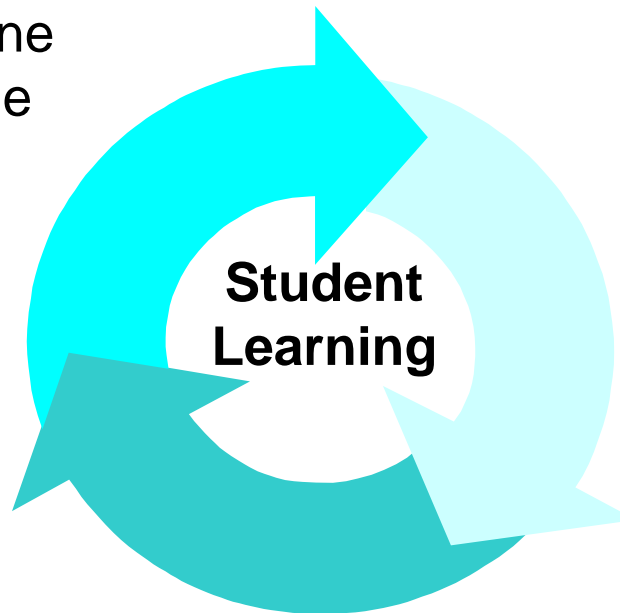**Student Learning**

3. Develop means of assessment and criteria for success for evaluating SLO's

4. Incorporate SLO's and assessment tasks into instruction

No "correct" list of PSLOs – they will differ by institution

Assessment of Learning Outcomes

- A variety of appropriate methods are used.

- The selected assessment measures the extent the outcome has been achieved.

- Assessment is meaningful
- Assessment guides program changes to improve quality of the program

Appropriate measures of Learning Outcomes

Direct Measures (all students)

- Capstone projects/senior projects

- Samples of student work

- Observations of student behavior (internships)

- Performance on a case study/problem

Appropriate measures of Learning Outcomes

Indirect Measures

- Alumni, employers, student surveys, Parents

- Focus target groups

- Job placement and higher studies statistics

- Exit survey with graduates

Capstone Project

Capstone Project is one year process in which students pursue independent **research or project** on a problem of their choice, engage in the relevant disciplines, under the guidance of a faculty.

produce a **scientific paper** and **product** that reflects a deep understanding of the topic

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Acknowledge

- First of all, I would like to express MY sincere thanks to all the **participants.**

- I express my gratitude to Principal -JNTUHCEJ, Registrar ,Rector, Vice Chancellor and Chancellor of My university (JNTUH) for encouraging .

- I would like to thank all the faculty members of my university(JNTUH) for their critical advice and guidance.

- I would like to express my special gratitude and thanks to Google management, web content developers , URL management , content publishers and referees for providing learning outcome material .

- I would like to say special thanks to SRKR management and IACC 2016 committees for providing platform to share this presentation.

- I would like to express my deep sense of gratitude to my family members.

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Thank you to all

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