



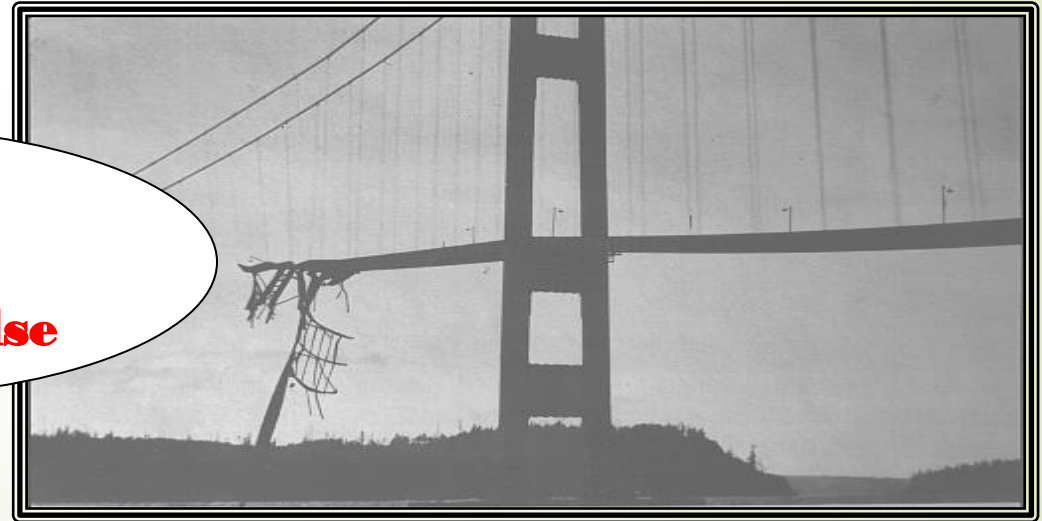
Writing good LOs in CB program specifications

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**If one doesn't know where one is going, how can one decide
how to get there?**

**You might
end up
somewhere else**



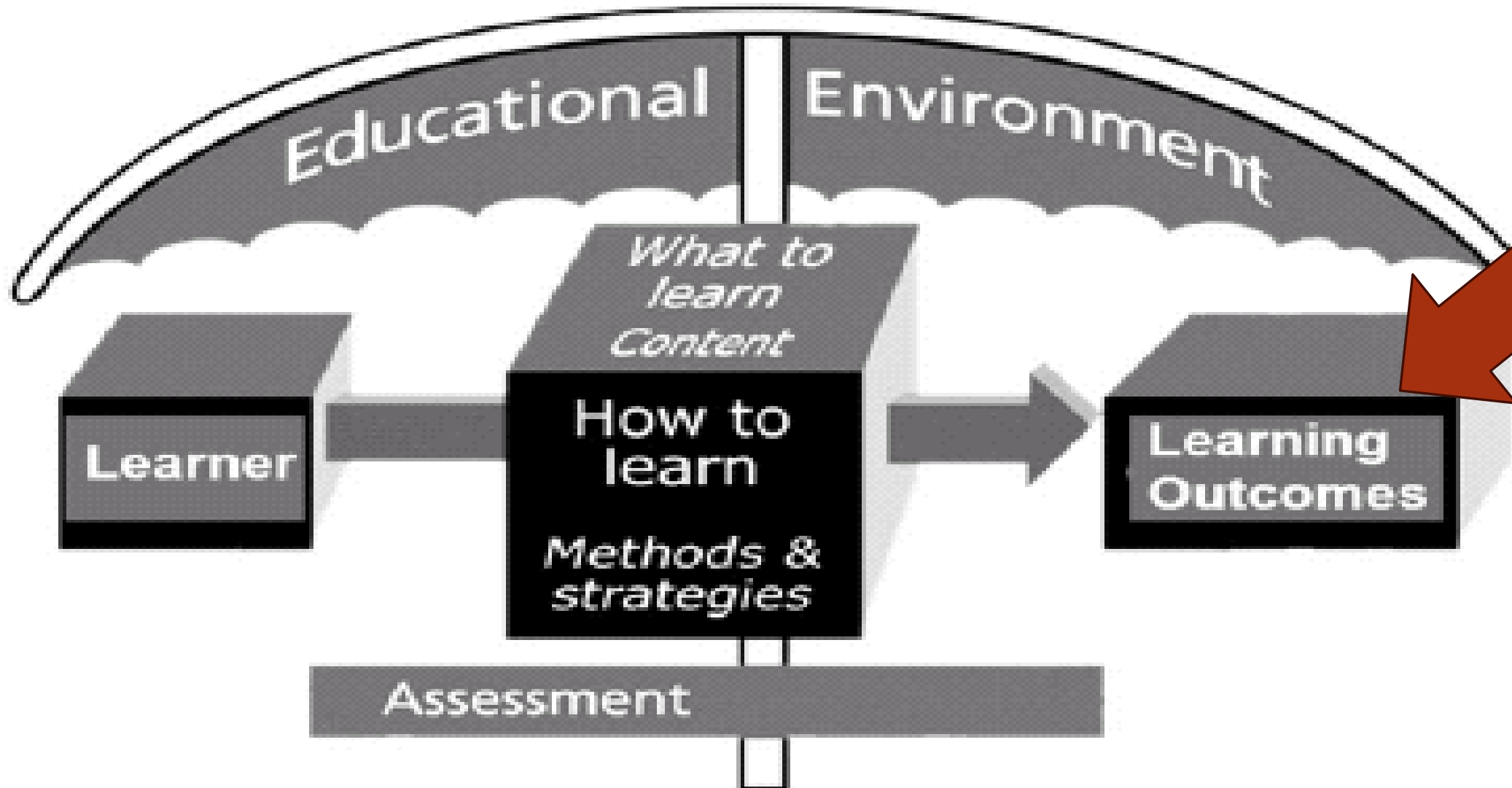
It always defined as...

► In Latin, the word “curriculum” means literally “to run a course.”

This concept of a curriculum has been widened to include:

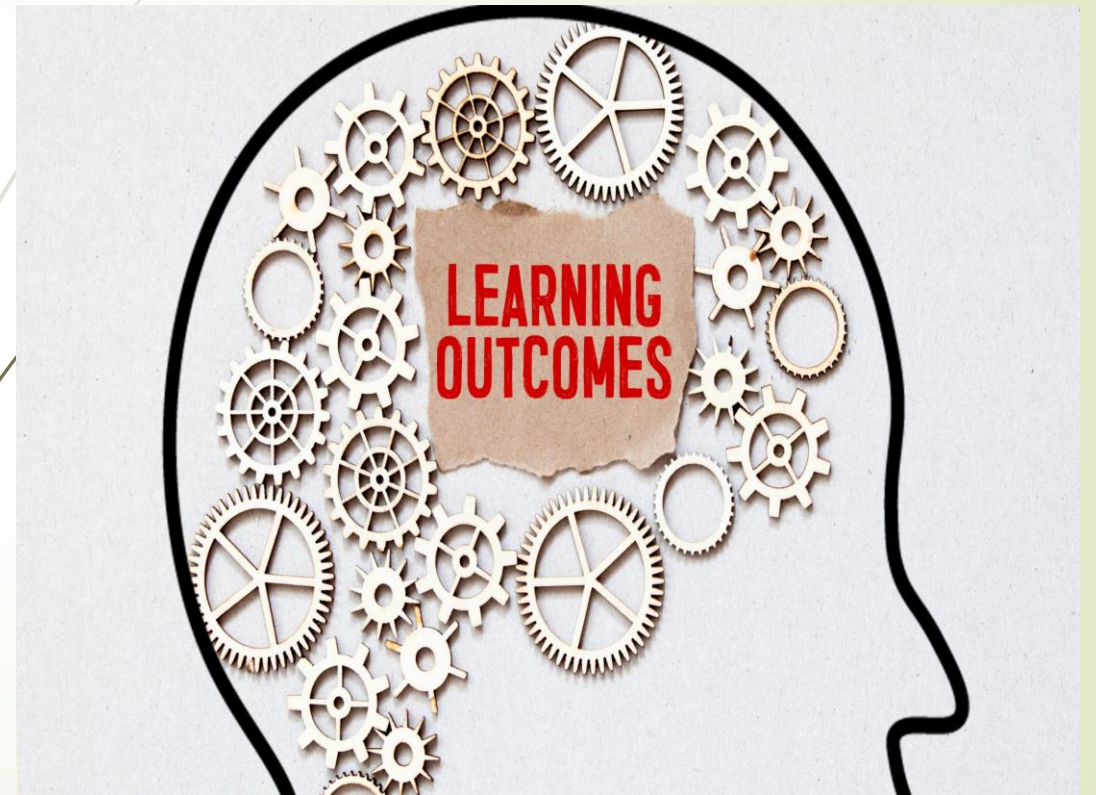
- the learning outcomes
- the teaching and learning methods
- the educational strategies
- the context for the learning **Scope & sequence – Syllabus - Content outlines – Standards – Textbooks - A course of study**
- the learning environment
- the assessment procedures.

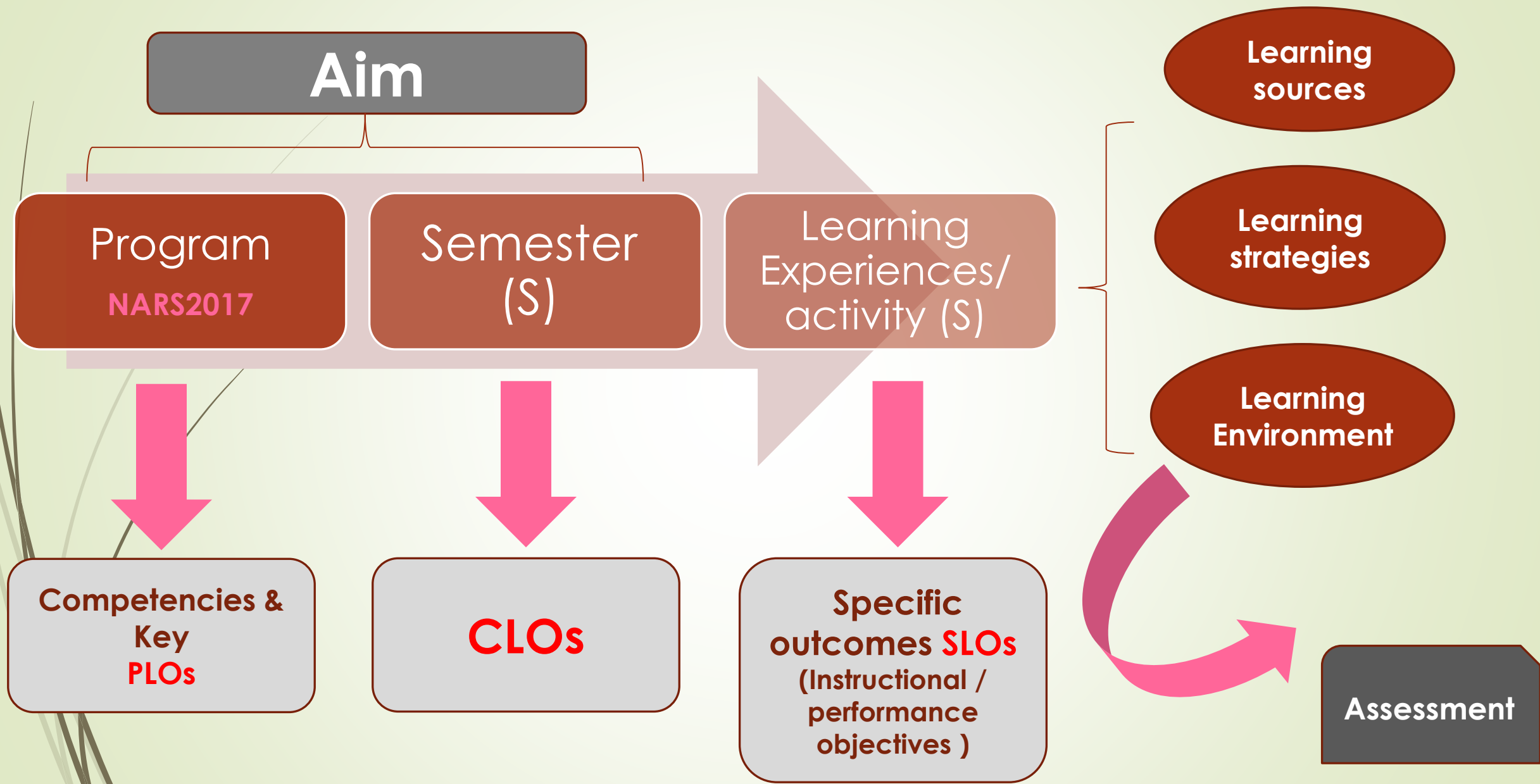
However, it t correct to be...





Learning outcomes





Aim

Program
NARS2017

Semester
(S)

Learning Experiences/ activity (S)

Learning sources

Learning strategies

Learning Environment

Competencies & Key PLOs

CLOs

Specific outcomes SLOs
(Instructional / performance objectives)

Assessment



Aim Versus objective

The aim is about **what you hope to do**, your overall intention in the Program. It signals what and/or where you aspire to be by the end

The objectives, and there are usually **more than one**, are the **specific steps you will take to achieve your aim**. This is where you make the project tangible by saying how you are going to go about it.

Program Outcomes (PLOs)



Traditional education... OBE...CBE



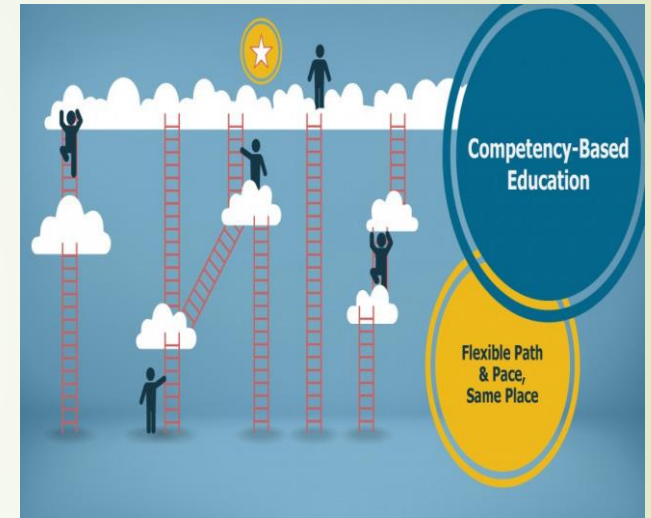
Design a curriculum

Teaching methods

Assessment of learners



- **Exit outcomes** are a critical factor in designing the curriculum



It de-emphasises time-based training and promises a greater accountability, flexibility, and learner centeredness.

Five Learning Domains:

1- **Knowledge and Understanding:** ability to recall, understand, & present information

2- **Intellectual Skills:** Apply conceptual understanding of concepts, principles, and theories

3- **Professional and Practical Skills:** Application of specialized knowledge, training and proficiency in a subject or field to attain successful career development and personal advancement.

4- **General and Transferable Skills:** Skills that are not subject-specific and commonly needed in education, employment, life-long learning and self development.

5- **Professional attitude**

6- **Communication skills**



Important Topics That Otherwise Might Be Neglected:

- ▶ Communication Skills,
- ▶ Attitudes & Professionalism,
- ▶ Health Promotion,
- ▶ Management of Errors.
- ▶ Clinical Reasoning, Decision Making,
- ▶ Self-assessment,
- ▶ Quality & Safety Improvement Skills,
- ▶ Interprofessional Teamwork,
- ▶ Creativity,
- ▶ Patient Safety & Social Responsibility

NARS 2017/ Undergraduates' Medical Program

The graduate as.....

Domain 1: Fundamental Knowledge

Domain 2: Professional and Ethical Practice

Domain 3: Pharmaceutical Care

Domain 4: Personal Practice

Specific *Enabling Competencies*

Competency I 7 enabling / key competencies

Competency II 18 enabling / key competencies

Competency III 10 enabling / key competencies

Competency IV 7 enabling / key competencies

- 
- Defining program outcomes expected competencies of graduates.

Competence = Knowledge + Skill + Attitude



Competency Area I: FUNDAMENTAL KNOWLEDGE



Competency Area I: FUNDAMENTAL KNOWLEDGE

Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care

The graduate should be able to:

KEY ELEMENTS

- 1-1-1- Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.
- 1-1-2- Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.
- 1-1-3- Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/natural pharmaceutical materials/products.
- 1-1-4- Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.
- 1-1-5- Retrieve information from fundamental sciences to solve therapeutic problems.
- 1-1-6- Utilize scientific literature, and collect and interpret information to enhance professional decision.
- 1-1-7- Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.



Competency Area II: **PROFESSIONAL AND ETHICAL PRACTICE**



Competency Area II: PROFESSIONAL AND ETHICAL PRACTICE

Work collaboratively as a member of an inter-professional health care team to improve the quality of life of individuals and communities, and respect patients' rights. The graduate should be able to:

KEY ELEMENTS

- 2-1-1 Perform responsibilities and authorities in compliance with the legal and professional structure and role of all members of the health care professional team.
- 2-1-2 Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.
- 2-1-3 Recognize own personal and professional limitations and accept the conditions of referral to or guidance from other members of the health care team.

Competency Area II: PROFESSIONAL AND ETHICAL PRACTICE

Standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines. **The graduate should be able to:**

KEY ELEMENTS

- 2-2-1 Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/natural pharmaceutical materials.
- 2-2-2 Apply the basic requirements of quality management system in developing, manufacturing, analyzing, storing, and distributing pharmaceutical materials/products considering various incompatibilities.
- 2-2-3 Recognize the principles of various tools and instruments, and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.
- 2-2-4 Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and bio-pharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.

Competency Area II: PROFESSIONAL AND ETHICAL PRACTICE

Handle and dispose biologicals and synthetic/natural pharmaceutical materials/products effectively and safely with respect to relevant laws and legislations. **The graduate should be able to:**

2-3-1 Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field.

2-3-2 Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.

Competency Area II: PROFESSIONAL AND ETHICAL PRACTICE

Actively share professional decisions and proper actions to save patient's life in emergency situations including poisoning with various xenobiotics, and effectively work in forensic fields. The graduate should be able to:

- 2-4-1 Ensure safe handling/use of poisons to avoid their harm to individuals and communities.
- 2-4-2 Demonstrate understanding of the first aid measures needed to save patient's life.
- 2-4-3 Take actions to solve any identified medicine-related and pharmaceutical care problems.
- 2-4-4 Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens.

Competency Area II: PROFESSIONAL AND ETHICAL PRACTICE

Contribute in pharmaceutical research studies and clinical trials needed to authorize medicinal products.

The graduate should be able to:

- 2-5-1 Fulfill the requirements of the regulatory framework to authorize a medicinal product including quality, safety, and efficacy requirements.
- 2-5-2 Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession.
- 2-5-3 Contribute in planning and conducting research studies using appropriate methodologies.

Competency Area II: PROFESSIONAL AND ETHICAL PRACTICE

Contribute Perform pharmacoeconomic analysis and develop promotion, sales, marketing, and business administration skills.

The graduate should be able to:

2-6-1 Apply the principles of business administration and management to ensure rational use of financial and human resources.

2-6-2 Utilize the principles of drug promotion, sales, marketing, accounting, and pharmacoeconomic analysis.



Competency Area III: **PHARMACEUTICAL CARE**



Competency Area III: PHARMACEUTICAL CARE

Apply the principles of body functions to participate in improving health care services using evidence-based data.

The graduate should be able to:

- 3-1-1 Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.
- 3-1-2 Apply the principles of public health and pharmaceutical microbiology to select and assess proper methods of infection control.
- 3-1-3 Monitor and control microbial growth and carry out laboratory tests for identification of infections/diseases.
- 3-1-4 Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.

Competency Area III: PHARMACEUTICAL CARE

Provide counseling and education services to patients and communities about safe and rational use of medicines and medical devices. The graduate should

be able to:

- 3-2-1 Integrate the pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, adverse drug reactions and drug interactions.
- 3-2-2 Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.
- 3-2-3 Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals.
- 3-2-4 Provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control.
- 3-2-5 Educate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC preparations and medical devices.
- 3-2-6 Maintain public awareness on social health hazards of drug misuse and abuse.



Competency Area IV: **PERSONAL PRACTICE**



Competency Area III: PERSONAL CARE

Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills. The graduate should be able to:

- 4-1-1 Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.
- 4-1-2 Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.
- 4-1-3 Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.

Competency Area III: PERSONAL CARE

Effectively communicate verbally, non-verbally and in writing with individuals and communities. The graduate should be able to:

- 4-2-1 Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care team, patients, and communities.
- 4-2-2 Use contemporary technologies and media to demonstrate effective presentation skills.

Competency Area III: PERSONAL CARE

Express self-awareness and be a life-long learner for continuous professional improvement.

The graduate should be able to:

- 4-3-1 Perform self-assessment to enhance professional and personal competencies.
- 4-3-2 Practice independent learning needed for continuous professional development.

Semester/Course Outcomes (CLOs)

Specific Outcomes (instructional objectives) (SLOs)



Difference Between Program Learning Outcomes & Course Learning Outcomes

Program ILOs = Competencies are broad for all students in the program.

Course “Semester” LOs are content or skill specific in:

Describing what the student will be able to do.

They determine: 1. **Content**, 2. **Delivery** and 3. **Assessment** of each course and, along with other courses, meet the program outcomes.



- **Learning outcomes, if set out appropriately,:**

1- **Intuitive and user-friendly**. used easily in curriculum planning, (in teaching, learning & assessment).

2- **Broad statements** & usually designed (**8–12 higher-order outcomes**).

3- Recognize the **authentic interaction and integration** in clinical practice of knowledge, skills and attitudes.

4- Represent **what is achieved and assessed at the end of a course** of study & not only the aspirations or what is intended to be achieved for each instruction.

Learning outcomes differ from instructional objectives in (Harden, 2002):

- **Learning outcomes are** statements of what the *student will be able to do or demonstrate* as a result of their learning and are part of a **student-centered approach**.
- **Learning objectives are** statements of what the *teacher intends* for the students to learn and are generally part of a **teacher-centered approach [are mission, traditional, teacher or content driven]**.

Criteria Of Good Learning objective / outcome

Objective

- S** Specific
- M** Measurable
- A** Achievable
- R** Relevant
- T** Time – Bound
- E** Evaluated
- R** Rewarding

Outcome

- S** Broader
- M** Measurable & observable
- A** Ascending complexity
- R** Relevant to (time - resources
time relevance)
- E** Evaluated
- R** Rewarding

Program ILO

2-4-2 Demonstrate understanding of the first aid measures needed to save patient's life.

Course ILO

2.4.2.1 Determine recovery positions and airway management techniques ability to maintain an open airway and control bleeding.

2.4.2.2 Identify cardiac arrest and other potentially fatal emergencies

2.4.2.3 Safely use of an Automated External Defibrillator (AED)

2.4.2.4 Work effectively as part of a team in an emergency

Course ILO

2.4.2.1 Determine recovery positions and airway management technique's ability to maintain an open airway and control bleeding.

2.4.2.2 Identify cardiac arrest and other potentially fatal emergencies

Learning 1 / instructional objectives

- 1- define what is BLS
- 2- Outline steps for BLS
- 3- Determine different airway management techniques
- 4- Demonstrate ability to maintain open airway

Learning II / instructional objectives

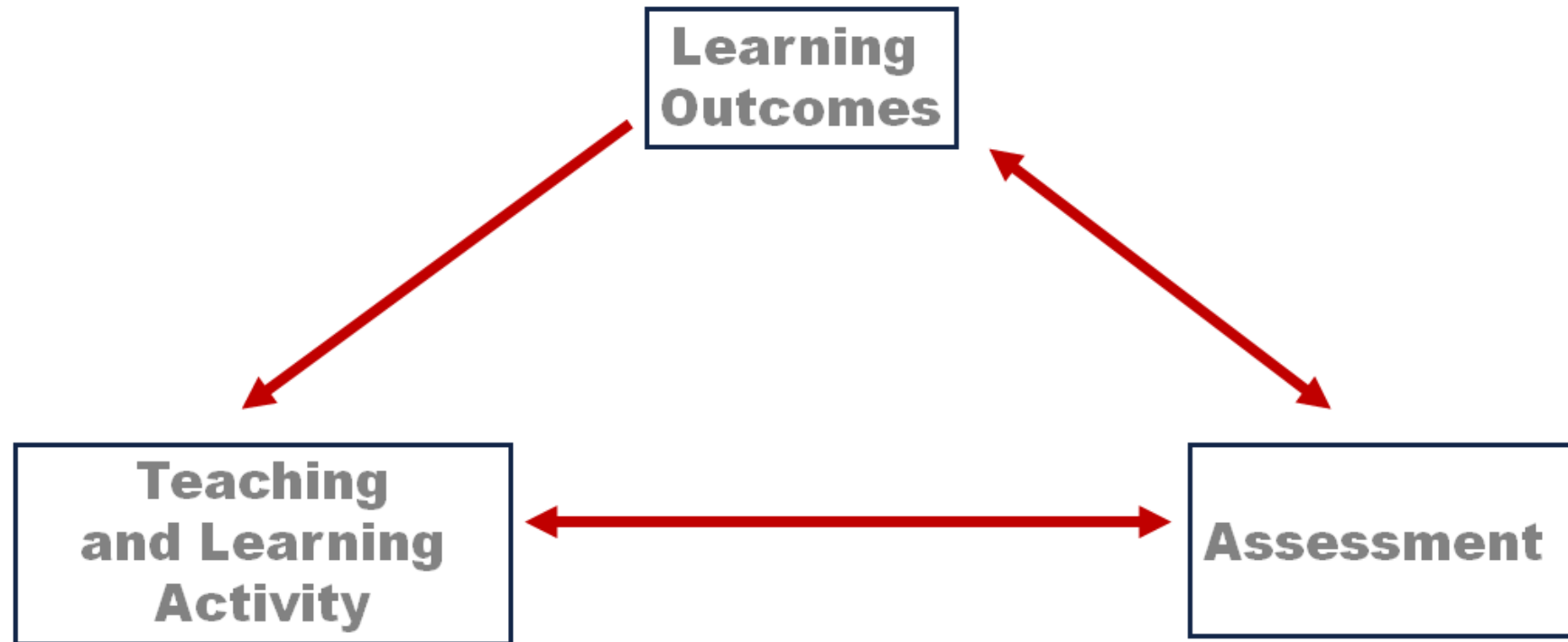
- 1- Define cardiac arrest
- 2- list potentially fatal emergencies
- 3- Compare & contrast between different fatal emergencies
- 4- survey potentially fatal emergencies

Construction / Writing LOs



How To Formulate an ILO

Constructive Alignment: The “Golden Triangle”



Writing Learning Outcomes

- ▶ Learning outcomes should specify the **minimum** acceptable standard for a student to be successful (pass a course) “**threshold level**”.
- ▶ This means that it is important to express learning outcomes in terms of the **essential** learning for a course, so there should be **a small number of learning outcomes** which are of central importance, not a large number of superficial outcomes.

Core learning outcomes

Must

Should

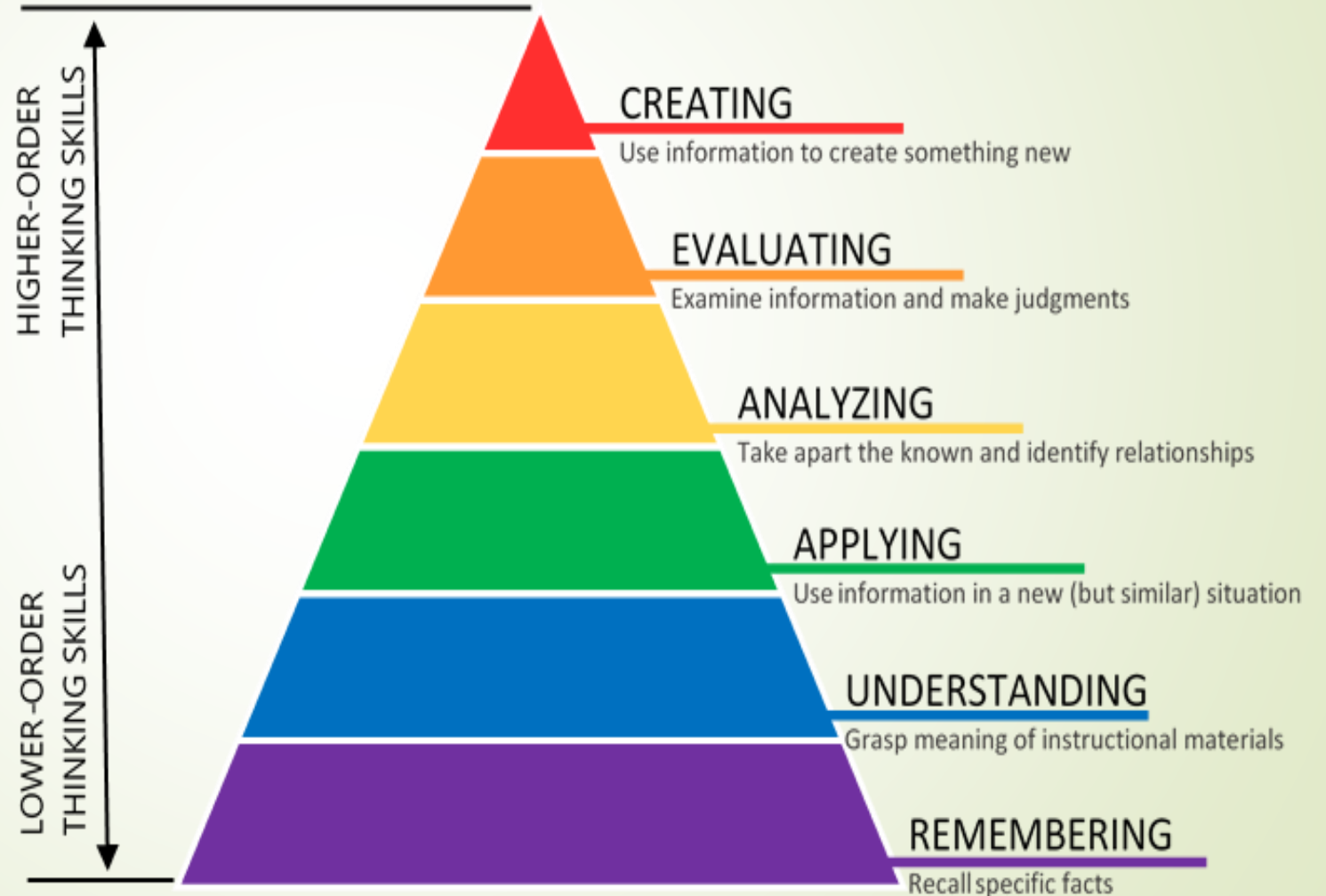
Nice to know

Bloom's Taxonomies

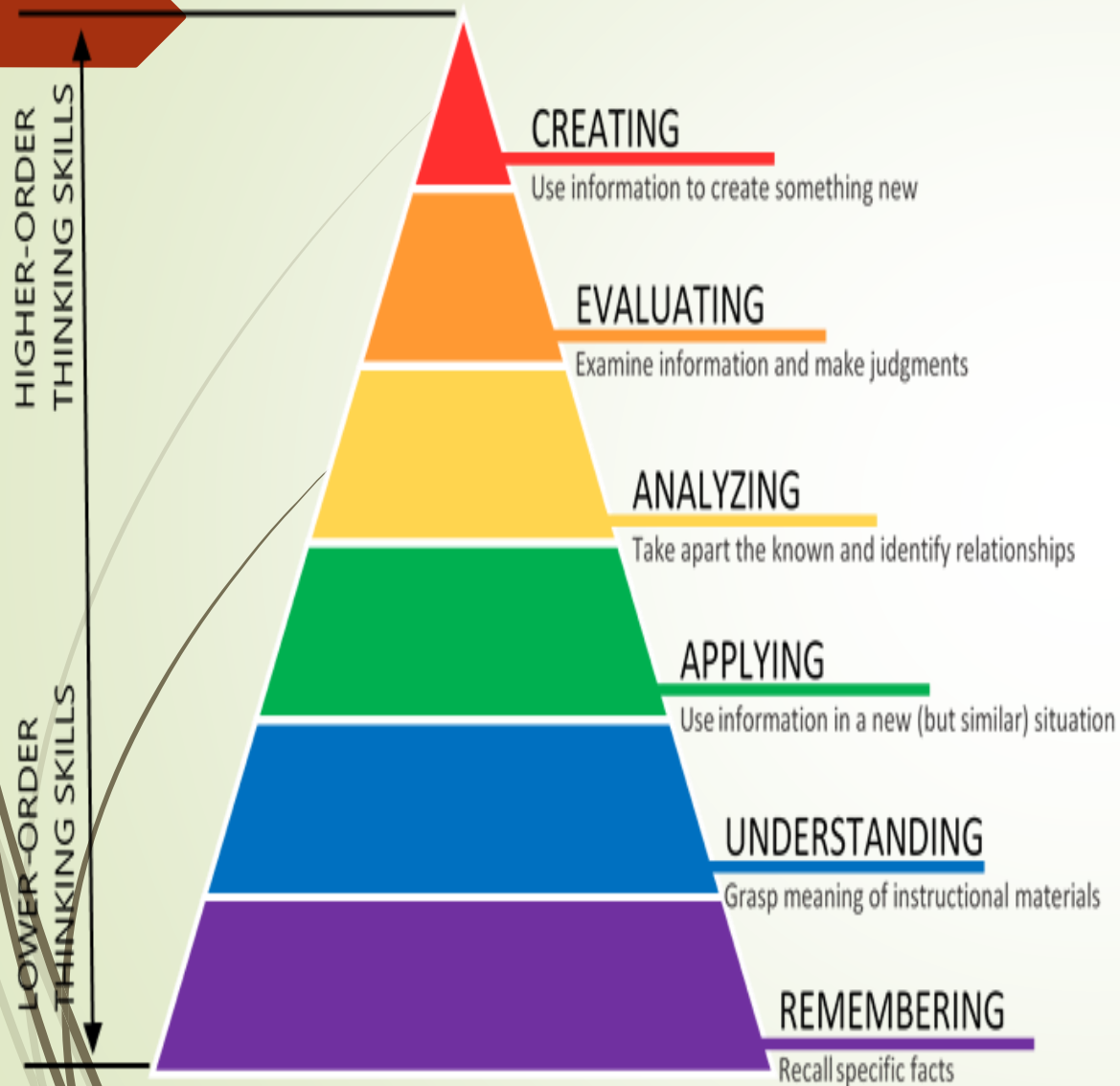
Cognitive Domain



BLOOM'S TAXONOMY – COGNITIVE DOMAIN (2001)



BLOOM'S TAXONOMY – COGNITIVE DOMAIN (2001)



The ability to put parts together

The ability to judge the value of material for a given purpose

The ability to break down information into its components,

The ability to use learned material in new situations,

The ability to understand and interpret learned information

The ability to recall or remember facts without necessarily understanding them



Please DON'T Use **Vague** Verbs:

- 1. Understand**
- 2. Know**
- 3. Appreciate**
- 4. Believe**
- 5. Internalize**
- 6. Enjoy**
- 7. Gain**
- 8. Learn**
- 9. Have Faith In / Believe**
- 10. Grasp**
- 11. Be familiar With**

Bloom's Taxonomies

Psychomotor Domain

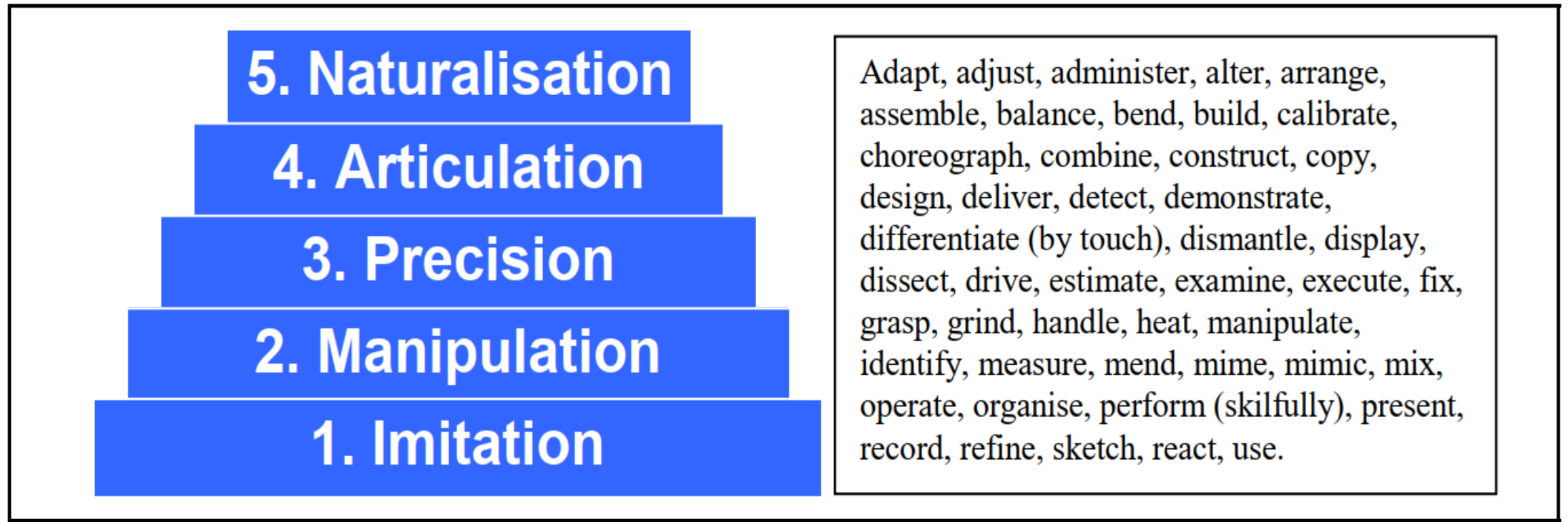


Fig. C 3.4-1-3

Hierarchy of psychomotor domain and some action verbs

Affective Domain

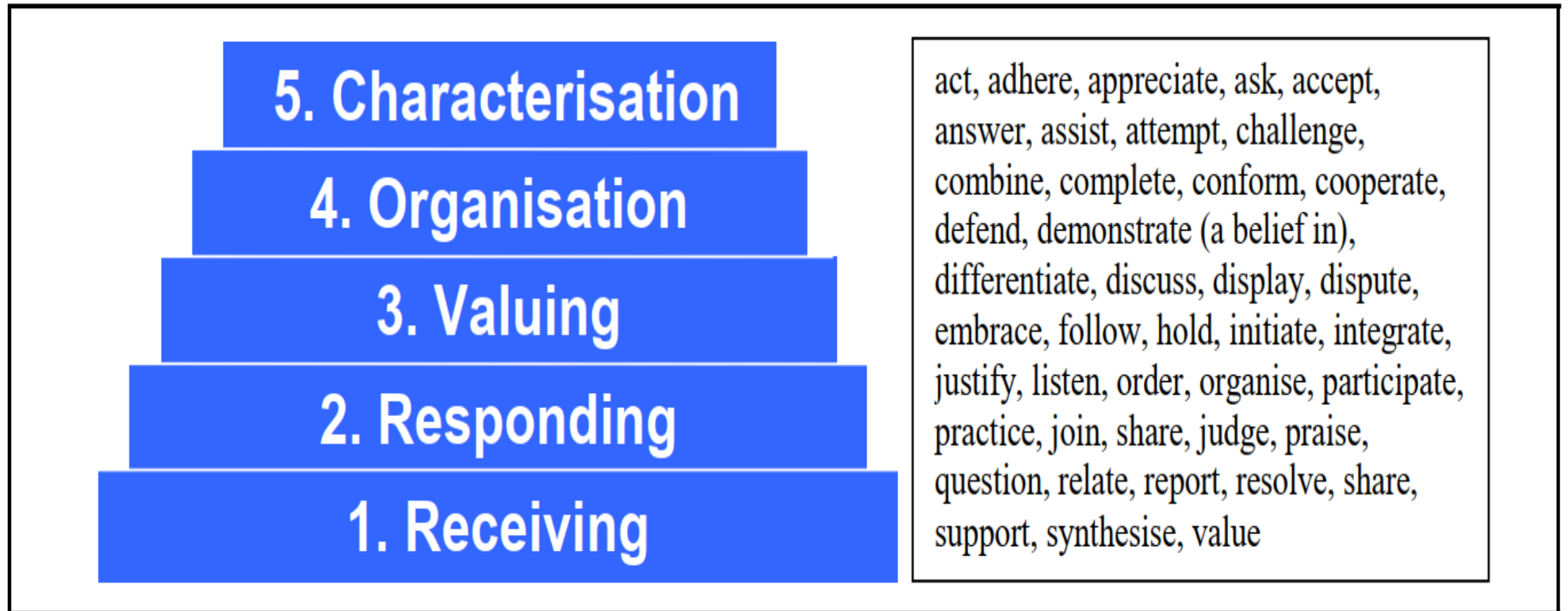


Fig. C 3.4-1-2

Hierarchy of affective domain and some action verbs

How To Formulate an ILO

LO = AV +Content ± Condition ± Criterion

Degree of accuracy

Tools, aids taken

Example:

1- By the end of the respiratory course, the student will be able to identify on frontal x-ray films of the thorax, the presence or absence of opacities of the pulmonary parenchyma, not less than 2 cm diameter in 80% of cases.

2- Given a set of data, the student will be able to compute the standard deviation



Example

Poor: To increase the student's ability to visually identify white cells on a differential.

Better: The student will identify correctly all white cells on a differential.

Poor : The student will gain knowledge of automated chemistry tests.

Better: The student will state the principle for each automated chemistry test listed.

Which seems a better LO?

I-

Students will name the three types of antibiotic in order to differentiate among the three.

Students will compare and contrast the characteristics of the three types of Antibiotic in order to differentiate among the three.

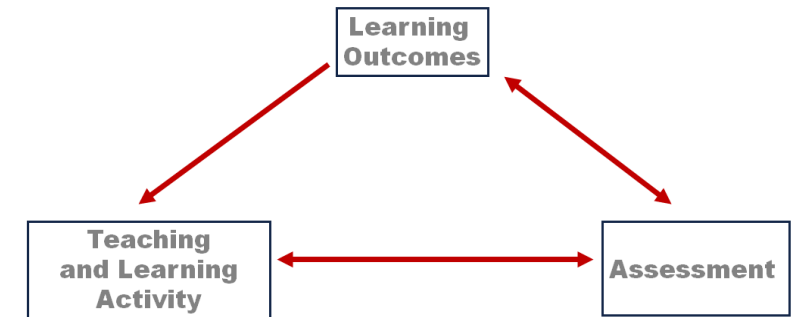
II- The student will be familiar with red blood cell maturation in the bone marrow.

The student will diagram the maturation of red blood cells

III- The student will understand the interpretation of hemoglobin electrophoresis patterns.

Given several electrophoretic scans, the student will correctly diagnose each normal or abnormal pattern.

Constructive Alignment: The “Golden Triangle”



Activate Windows

Teacher Perspectives: Objectives → DLOs* → Teaching Activities → Assessment



Student Perspectives: Assessment → Learning activities → Outcomes

* Desired Learning Outcomes

Fig. C 3.4-1-4

Teacher and student perspectives regarding assessment

Table C 3.4-1-2 Linking learning outcomes, teaching and learning activities and assessment

Learning outcomes	Teaching and Learning Activities	Assessment
<p>Cognitive</p> <p style="text-align: center;">↑</p> <div style="border: 1px solid black; padding: 5px; margin: 5px auto; width: 80%;"> Demonstrate knowledge Comprehension Application Analysis Synthesis Evaluation </div> <p style="text-align: center;">↓</p> <p>Affective</p> <p style="text-align: center;">↑</p> <div style="border: 1px solid black; padding: 5px; margin: 5px auto; width: 80%;"> Integration of beliefs, ideas and attitudes </div> <p style="text-align: center;">↓</p> <p>Psychomotor</p> <div style="border: 1px solid black; padding: 5px; margin: 5px auto; width: 80%;"> Acquisition of physical skills </div>	<p>Lectures</p> <p>Tutorials</p> <p>Discussions</p> <p>Laboratory work</p> <p>Clinical work</p> <p>Group work</p> <p>Seminar</p> <p>Peer group presentation</p>	<p>End of module exam</p> <p>Multiple choice tests</p> <p>Essays</p> <p>Practical assessment.</p> <p>Fieldwork</p> <p>Clinical practice</p> <p>Presentation</p> <p>Project work</p>

When there is alignment between what we want, how we teach and how we assess, teaching is likely to be much more effective than when it is not (aligned)... Traditional transmission theories of teaching ignore alignment.

Activity 1: Evaluate these SLOs:

Is it SMART

What is its domain

What is appropriate teaching & learning strategy?

Define appropriate assessment strategy

1- By the end of that course, the student will be able to understand the basic concepts of molecular biology

Activity 1: Evaluate these SLOs

- 2- By the end of that course, the student will be able to communicate respectfully with colleagues**
- 3- teacher will provide theoretical tools of problem solving**
- 4- By the end of the cardiology course, the student will be able to measure blood pressure of adult person using mercury sphygmomanometer with accuracy 100%**
- 5- by the end of statistics course, the student will be able to collect data and analyse it and present it in graphs**

