

Spatial Data Infrastructure and Earth Observation Education and Training for North Africa



Co-funded by the
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SEED4NA

Virtual Summer School

18-27th May 2021

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of the European Union

Spatial Data Infrastructure and Earth Observation Education and Training for North Africa

Designing education: The ADDIE approach

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Presentation outline

- Designing instruction
- The ADDIE approach:
 - Analyze
 - Design / Develop
 - Learning objectives – Bloom’s Taxonomy
 - Implementation – Gagne’s events
 - Evaluation – Kirkpatrick’s levels



Designing instruction

- Instructional design (ID), is the practice of systematically designing, developing and delivering instructional products and experiences, both digital and physical, in a consistent and reliable fashion toward an efficient, effective, appealing, engaging and inspiring acquisition of knowledge.
- The process consists of:
 - determining the state and needs of the learner,
 - defining the end goal of instruction, and
 - creating some "intervention" to assist in the transition.
- There are many instructional design models but many are based on the ADDIE model

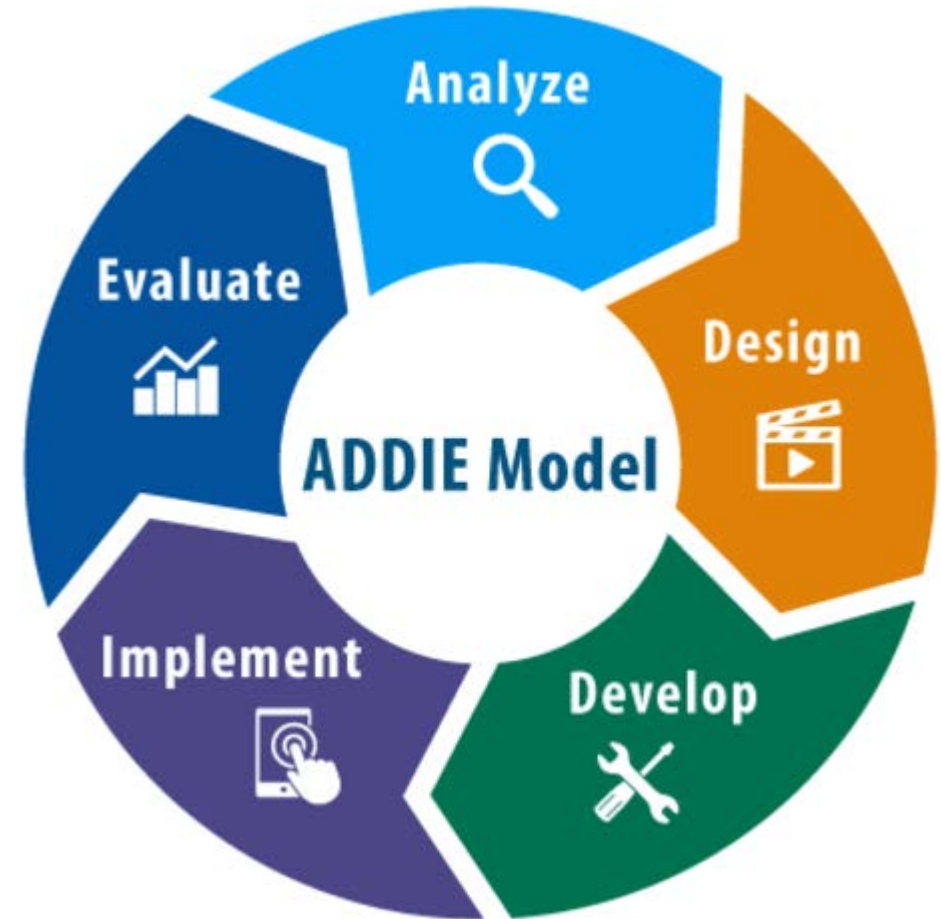
Instructional Design Model



Source: https://www.cidde.pitt.edu/fds/lrn_goals.htm

The ADDIE approach

- ADDIE Instructional Design (ID) method is a framework in designing and developing educational and training programs.
- Created by Florida State University for the military in the 1970s.
- “ADDIE” stands for **A**nalyze, **D**esign, **D**evelop, **I**mplement, and **E**valuate:
- The analysis phase is the input for the system; design, development, and evaluation are the process; and the implementation phase is the output.
- The sequence does not impose a strict linear progression through the steps. Stages may overlap somewhat



Step 1: Analyze

- a. Analyze your learners and gather as much information as you can on them.
- b. Analyze your broad goals for the lesson or unit

When you design any course, unit or lesson, the first questions you must ask yourself are:

- Who are my students?
- What are my goals
- What do I hope my students to know at the end of our experience?
- What do I want students to be able to do?

What do I need to know?

Demographics (age, gender, origin)

Background (academic, cultural)

Level of knowledge on the topic

Learning expectations / motivation

Learning styles

Environment

Perception of the learning process
(your role, their role)

Challenges (stress, color blindness)

Step 2: Design

Step 3: Development

- a. Identify learning objectives—what specific skills and knowledge do you wish students to obtain?
- b. Identify outcomes—how will you know that the students have achieved your learning objectives? How will you assess learning?
- c. Logistics
- In the design phase, the focus is on learning objectives, content, subject matter analysis, exercise, lesson planning, assessment instruments used and media selection.

What do I need to consider?

Level and type of material to be developed

Different types of media to be used (audio, video, graphics)

Teaching strategy

Temporal frame

Roadmap / Milestones

Logistics (environment, tools, setup)

Resources at hand (financial, time, man power)

Designing Learning Objectives

- After identifying broad learning goals we develop specific learning objectives.
- They related to the goals but more specific, describing in more explicit detail what we expect that students will know and be able to do.
- LO should be: S.M.A.R.T.
- Rules for developing objectives:
 - Start your statement with “Student will be able to. . . “
 - Begin each specific objective with an action verb, something that can be measured or observed. By using specific, measurable words you make it easier to develop your learning assessments. It also communicates more clearly to students what they will be learning in the course.
 - Do NOT begin objectives with words such as “understand” or “know.” We cannot directly observe if someone “understands” material—they must DO something with it for us to be able to determine if they understand.



Source: <https://instructionaldesigncompany.com/>

Blooms taxonomy

The model was devised in the 1950s by a committee of educators with the objective to create a common frame for curricula and examinations design. Revised and updated in the 2000s

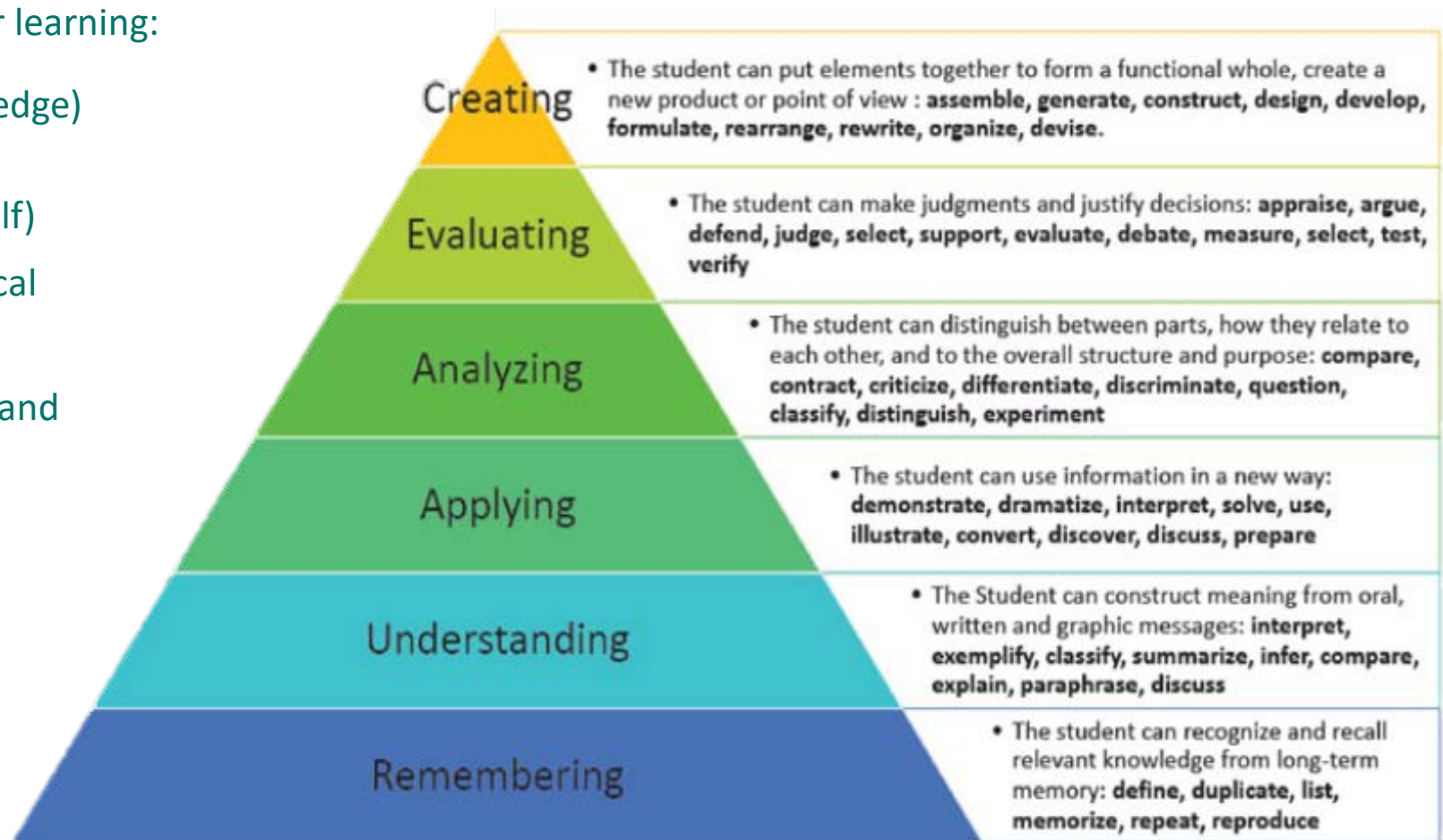
Three domains of educational activities: or learning:

- ✓ Cognitive: mental skills (knowledge)
- ✓ Affective: growth in feelings or emotional areas (attitude or self)
- ✓ Psychomotor: manual or physical skills (skills)

The cognitive domain involves knowledge and the development of intellectual skills

There are six major categories of cognitive processes.

The categories can be thought of as degrees of difficulties. That is, the first ones must normally be mastered before the next one can take place.



Writing Learning outcomes

At the end of this module, **the student** will be able to **build a basic Geodatabase according to specific requirements and data**



ABCD:	Guidelines:
Audience <hr style="border: 2px solid red;"/>	<i>Who are the learners?</i> Step 1: pick your target group
Behavior <hr style="border: 2px solid blue;"/>	<i>What is expected? (behavior or result)</i> Step 2a choose the right <u>verb</u> (-> Bloom) Step 2b determine the expected result
Condition <hr style="border: 2px solid orange;"/>	<i>Under what circumstances/context?</i> Step 3: determine conditions or circumstances under which the learning have to occur
Degree <hr style="border: 2px solid green;"/>	<i>How much will be accomplished? And to what level?</i> Step 4: determine criteria and, standards and/or level

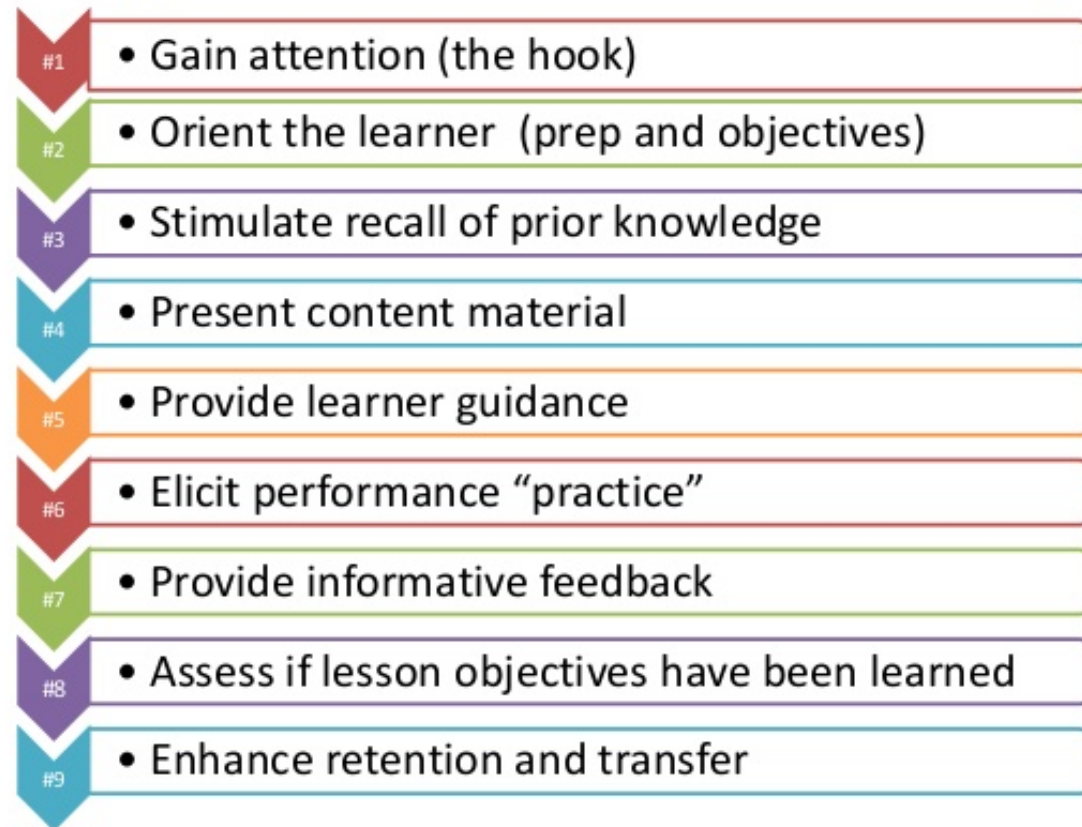
Step 4: Implementation

The main goal in this phase is to create effective learning situations.

Events of instruction for structuring a session:
In the 1960's Gagne created a nine-step process called the events of instruction, which correlate to and address the mental conditions of learning.

Make pedagogical strategy explicit → trigger learning mechanisms (Event #2)

9 Events of Instruction



Step 5: Evaluation

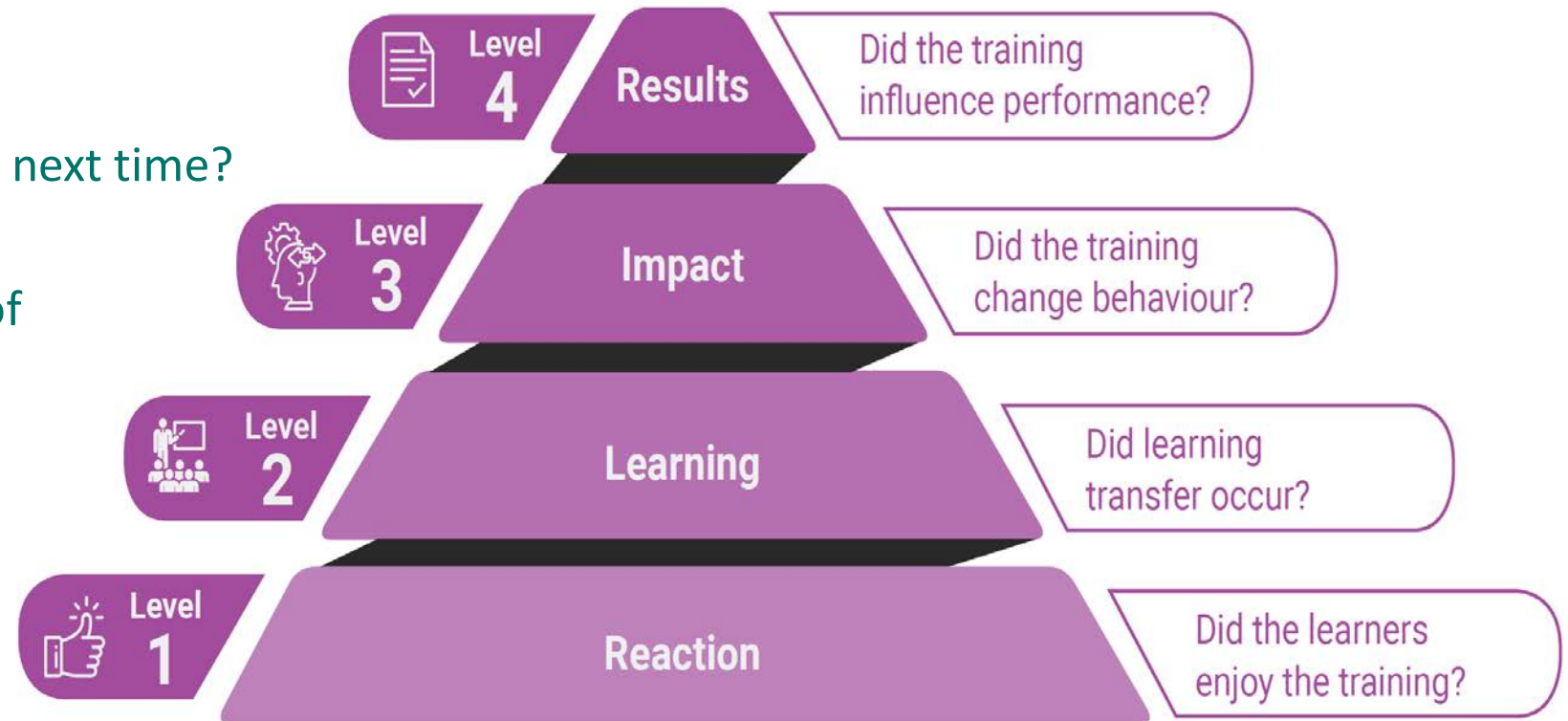
Were you successful?

Did students learn?

Did they have fun doing it?

What should you change for the next time?

Kirkpatrick developed a model of evaluation levels in 1959, and further developed it in 1975



Thank you for your attention!



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