

T3.A1 Foundations of Educational Design

Teaching & Learning Services



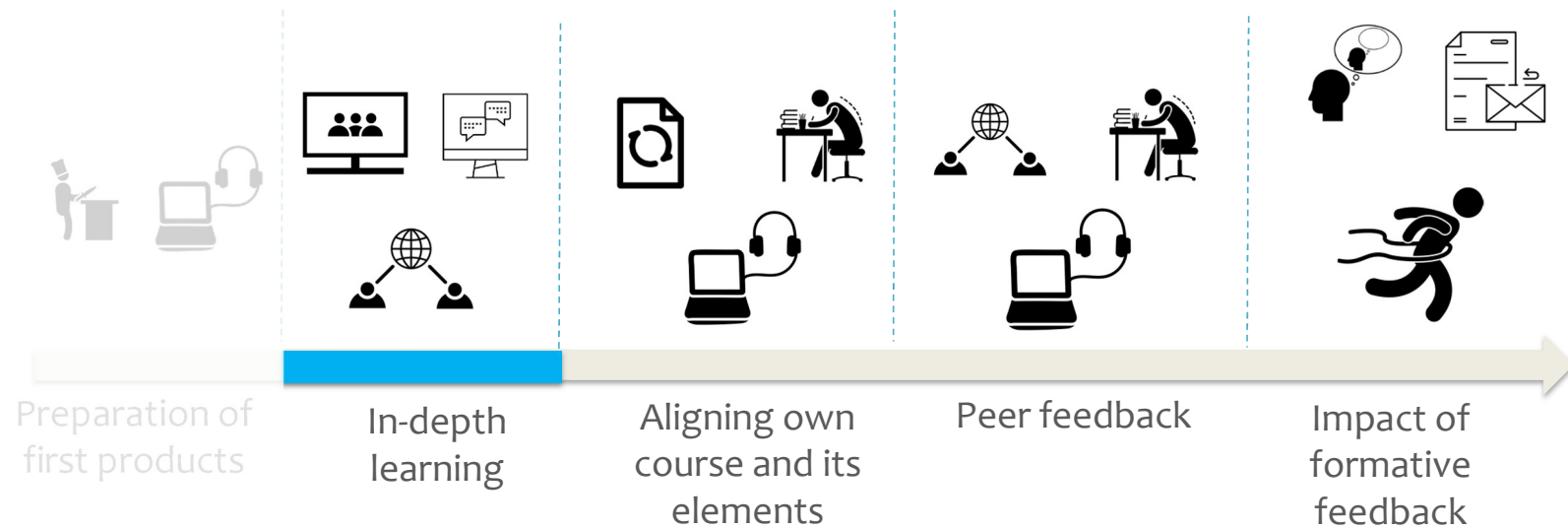
Programme

Course introduction

- Student Motivation
- Constructive Alignment
 - Learning Objectives
 - Learning Activities
 - Assessment
- Evaluating a course design

Wrap up & Next steps

T3.A1 - Overview



Learning objectives

After this course you should be able to:

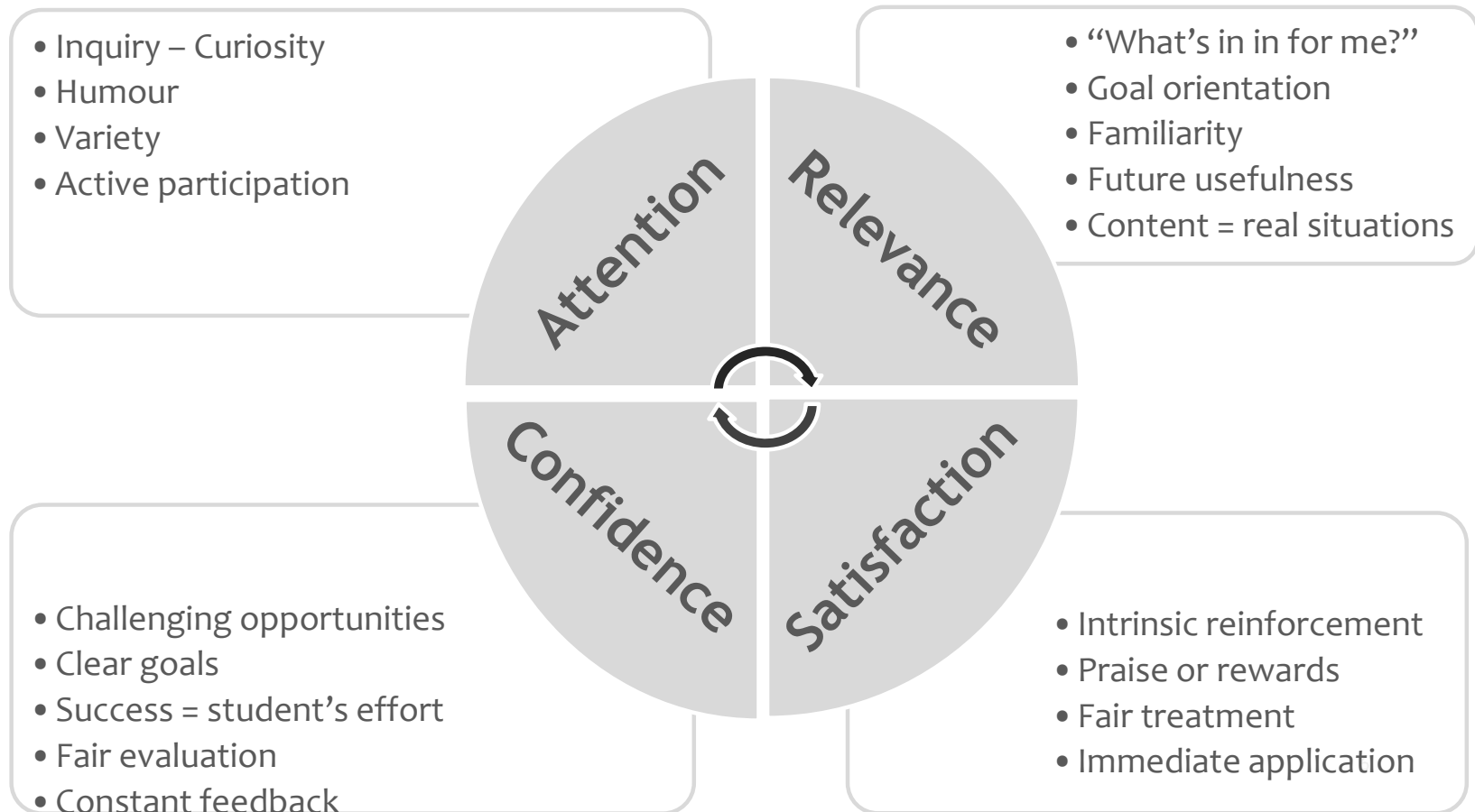
- LO1: Formulate learning objectives according to the guidelines presented in the course.
- LO2: Determine activating learning activities and assessments for your own course or teaching materials in line with the principles of constructive alignment and student motivation.
- LO3. Explain to what extent giving and receiving peer feedback impacted on your learning.

1. Student Motivation



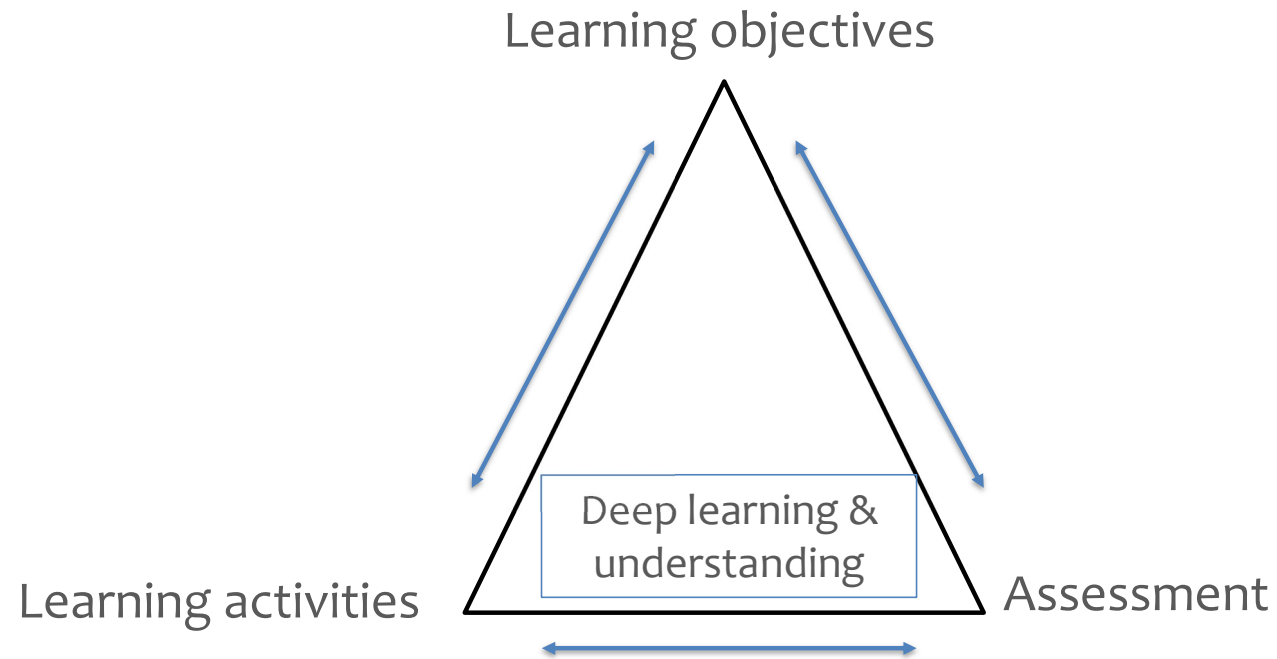
<https://blogs.flinders.edu.au/student-health-and-well-being/2019/05/14/the-challenges-of-self-discipline/not-a-runner-now-you-are-motivational-memes/>

Motivation

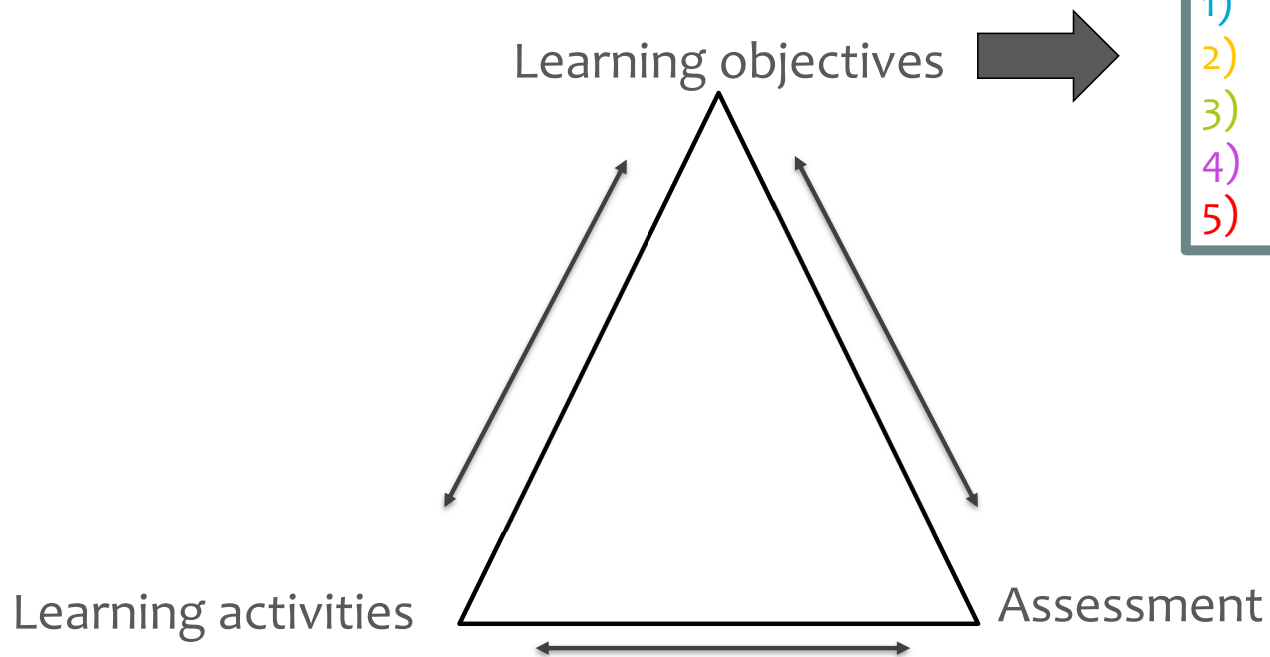


2. Constructive Alignment

Constructive Alignment



Constructive Alignment: Learning Objectives



Well-formulated Learning Objectives:

- 1) Time specific
- 2) Action verb
- 3) Content
- 4) Criterion
- 5) Condition/context

Constructive Alignment: Learning Objectives

Well-formulated
Learning Objectives:

- 1) Student centred
- 2) Action verb
- 3) Content
- 4) Criterion
- 5) Condition/context

- A. By the end of the course, you should be able to develop an energy demand/supply matching system consisting of at least six different stakeholders, using Python.
- B. By the end of the course, the student should be able to apply the working principles and foundational knowledge of Process Intensification to analyze and solve practical problems effectively.
- C. By the end of the course, you will be able to design simple superconducting transmission line circuits using Sonnet.

Learning Objectives: Observations

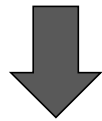
- **Don't include more than one action verb** per Learning Objective.
 - The student is able to **use** SPSS to **conduct** data analysis
 - The student is able to **explain, analyse** and **implement** the key elements for a solid course design
 - The student should be able to identify and be able to apply....

Tip: Focus on only one verb/skill per goal!

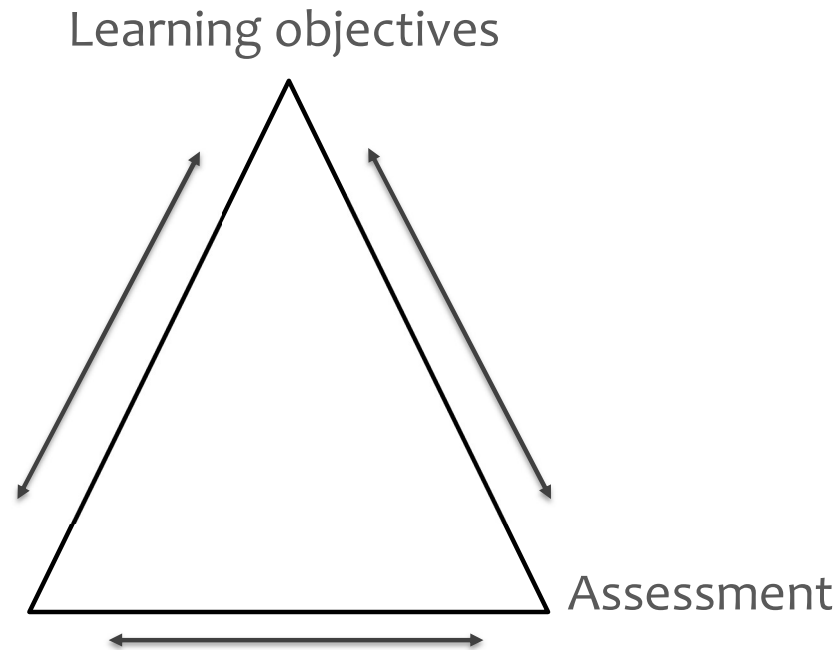
- When criterion is indicated like this: different, various, basic is still vague and needs to be specified.
- Verbs like: understand, gain knowledge, learn, know are not observable and measurable.
>> What will students do thanks to this knowledge?

Constructive Alignment: Learning Activities

Which learning activities will help students to achieve the learning objectives and prepare them for the assessment?



Learning activities

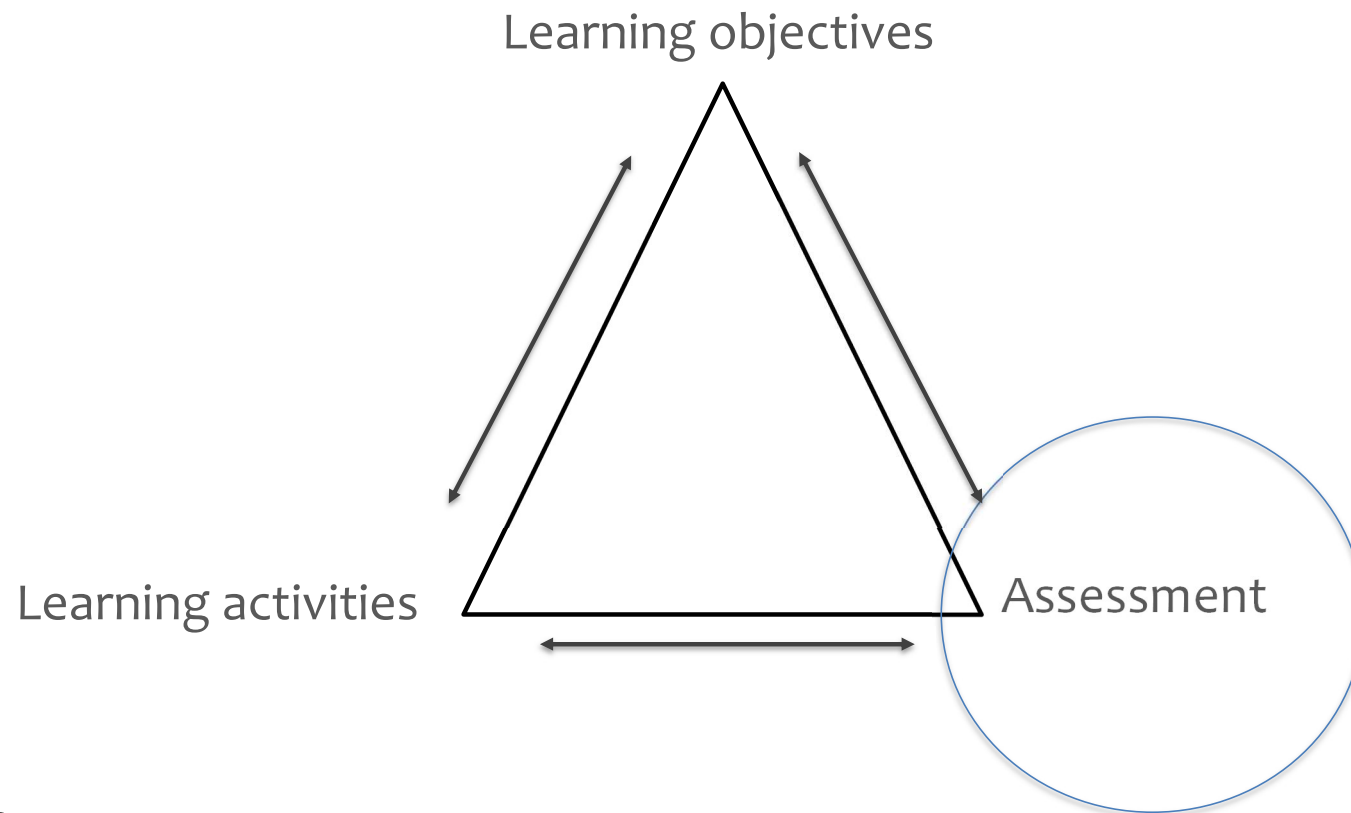


Bloom's Revised Taxonomy for Learning Objectives

REMEMBER	UNDERSTAND	APPLY	ANALYSE	EVALUATE	CREATE
To repeat or list information ¹ or procedures ²	To explain, paraphrase, organise, or exemplify information ¹ or procedures ²	To apply procedures ² , theories or skills to a known or similar situation ³	To break a complex situation ³ into parts or clusters ⁴ , and/or to identify what procedures ² , ideas ⁷ or relationships are applicable.	To assess information ¹ , procedures ² , tools, processes, skills, and/or products ⁵ on their quality ⁶ and/or significance in order to reach a conclusion, advice, decision, or proof.	To create original ideas ⁷ , procedures ² , tools, or products ⁵
¹ Information e.g. facts, terms, definitions/concepts, ideas, theories ² Procedures e.g. formulas, techniques, procedures, methodologies, rules, experiments, analyses ³ Situations e.g. problem, experiment, data, process, research question, literature, list of specifications, computer program, or other information			⁴ Parts or clusters e.g. causes and consequences, advantages and disadvantages, motives, stakeholders, and relations ⁵ Products e.g. computer programs, designs, data, products, list of specifications, literature ⁶ Quality e.g. reliability, validity ⁷ Ideas e.g. ideas, theories, hypotheses, opinions, research questions		
Example	Example	Example	Example	Example	Example
The student is able to list the steps in the following methods of analysis: interpolation and classification.	The student is able to explain the movement of bony segments of the human skeleton system.	The student is able to calculate the shear and bending moment resistance of pre-stressed concrete structures.	The student is able to derive equations describing the steady-state performance of the vehicles discussed during the course.	The student is able to evaluate the quality of the collected data.	The student is able to design systems engineering solutions through the use of requirements analysis and conceptual designs.
Verbs	Verbs	Verbs	Verbs	Verbs	Verbs
Reproduce: Duplicate, List, Repeat, Reproduce Find/identify in e.g. a figure: Identify ^{AN} , Label, Locate, Name, Recognise, Recall	Give explanation: Discuss ^{AN, EV} , Explain ^{EV} Give examples: Give examples, Illustrate ^{AP, CR} In other words: Define, Paraphrase, Rephrase, Restate, Summarise Organise information Categorise ^{AP, AN} , Compare ^{AN} , Contrast ^{AN} , Order ^{AN} , Organise ^{AP, AN}	Apply general: Apply, Administer, Develop ^{CR} , Employ, Perform, Use, Implement, Make use of Apply knowledge: Categorise ^{UN, AN} , Link ^{AN} Apply specific procedures/skills: Assemble, Calculate, Compile ^{CR} , Correlate ^{AN} , Construct ^{CR} , Evaluate, Experiment ^{CR} , Illustrate ^{UN, CR} , Interview, Simulate, Solve ^{AN, EV, CR}	Analyse in general: Analyse, Appraise ^{EV} , Estimate, Examine, Inspect, Investigate, Research, Simplify ^{CR} , Solve ^{AP, EV, CR} Divide: Breakdown, Categorise ^{UN, AP} , Discriminate, Dissect, Divide, Isolate, Prioritise ^{EV} , Order ^{UN} , Organise ^{UN, AP} Arguments (one sided): Criticise ^{EV} , Debate ^{EV} , Discuss ^{UN, EV} , Focus, Highlight, Motivate, Point out, Reason ^{EV} Relationships: Compare ^{UN} , Contrast ^{UN} , Correlate ^{AP} , Infer ^{EV} , Link ^{AP} , Model ^{CR} , Rank, Relate, Reorganise Select applicable procedure/theory/skill: Choose ^{EV} , Identify ^{UN} , Model, Select ^{EV} , Simplify	Taking into consideration: Consider, Deduct, Reason ^{AN} , Value Working towards a conclusion*: Appraise ^{AN} , Assess, Award, Evaluate, Grade, Mark, Rate, Reason ^{AN} , Score, Solve a problem ^{AP, AN, CR} Reaching a conclusion*: Advise, Choose ^{AN} , Conclude, Decide, Determine, Judge, Prioritise ^{AN} , Select ^{AN} Defending a conclusion* (or not): Argue, Convince, Criticise ^{AN} , Debate ^{AN} , Disprove, Dispute, Influence, Justify, Persuade, Prove, Reason ^{AN} , Recommend, Support, Validate Discuss consequences/significance of conclusion*: Discuss ^{AN, UN} , Explain (results, consequences for stakeholders, society, etc.) ^{UN} , Induce, Infer ^{AN} ,	Make something new: Compose, Create, Design, Develop ^{AP} , Discover, Experiment ^{AP} , Invent, Plan Change something: Adapt, Change, Innovate, Modify, Reframe, Revise, Simplify ^{AN} , Substitute, Transform Add something: Add to, Elaborate, Extend Improve something: Improve, Maximise, Minimise Combine some things: Combine, Compile ^{AP} , Integrate New ideas: Formulate, Hypothesise, Originate, Propose, Speculate, Suggest, Theorise Construct: Construct ^{AP} , Illustrate ^{UN, AP} , Draw, Visualise Other: Model ^{AN} , Solve ^{AP, AN, EV} , Program
^{UN, AP, AN, EV, CR} Some verbs can be used in multiple levels of the taxonomy. This is indicated with the superscripts: UNderstand, APply, ANalyse, EValuate or CReate. The verbs used in this document are a selection of the possibilities. You can also use other verbs.					
Products	Products	Products	Products	Products	Products
Definition Fact Label List Reproduction Quotes	Categorisation Collection Closed questions (e.g. true/false, multiple choice) Examples Explanation Outline Summary Devise a wiki entry	Demonstration (e.g. video) Illustration Interview Performance Presentation	Role play Simulation Use formulas, programs, rules, procedure, techniques Calculation	Abstract Analysis of a case/situation Case presentation Chart Checklist Discussion of the (quality of) results Graph Observation of professional practice Peer feedback Report Spreadsheet Survey	Advise Case presentation Comment Conclusion Discussion/debate Essay Evaluation Judgement Opinion Recommendation Report Review Verdict Computer program Design plan/ blueprint/ scheme/drawings Exam questions Game Paper Plan Portfolio Project Prototype Research proposal

 This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).
 Please attribute [Lisette Harting](#), [Gariné Apikian](#) & [Wiebe Dijkstra](#), Delft University of Technology.
 If you have any feedback please contact the authors. Version: September 2019.

Constructive Alignment: Assessment



Intro: Formative and Summative Assessment

Formative

Assessment *for* learning

Is meant to:

- Monitor student learning to provide feedback
- Help students identify their strengths and weaknesses and target areas that need work
- Help the teacher to recognize where students are struggling and address problems immediately

Formative assessments are generally *low stakes*, with a low or no point value.



Created by Creative Mahira
from Noun Project

Summative

Assessment *of* learning

Is meant to:

- Evaluate student learning at the end of an instructional unit by comparing it against the learning objectives (standard/benchmark)
- Grade student learning

Summative assessments are often *high stakes*, with a high point value.



Created by Scott Lewis
from Noun Project

3. Evaluating a course design

Learning Activity #3: Constructive not-so-alignment table

Learning Objective	Cognitive level
Build a prototype of a well and its surface facilities using the materials and design provided.	Apply

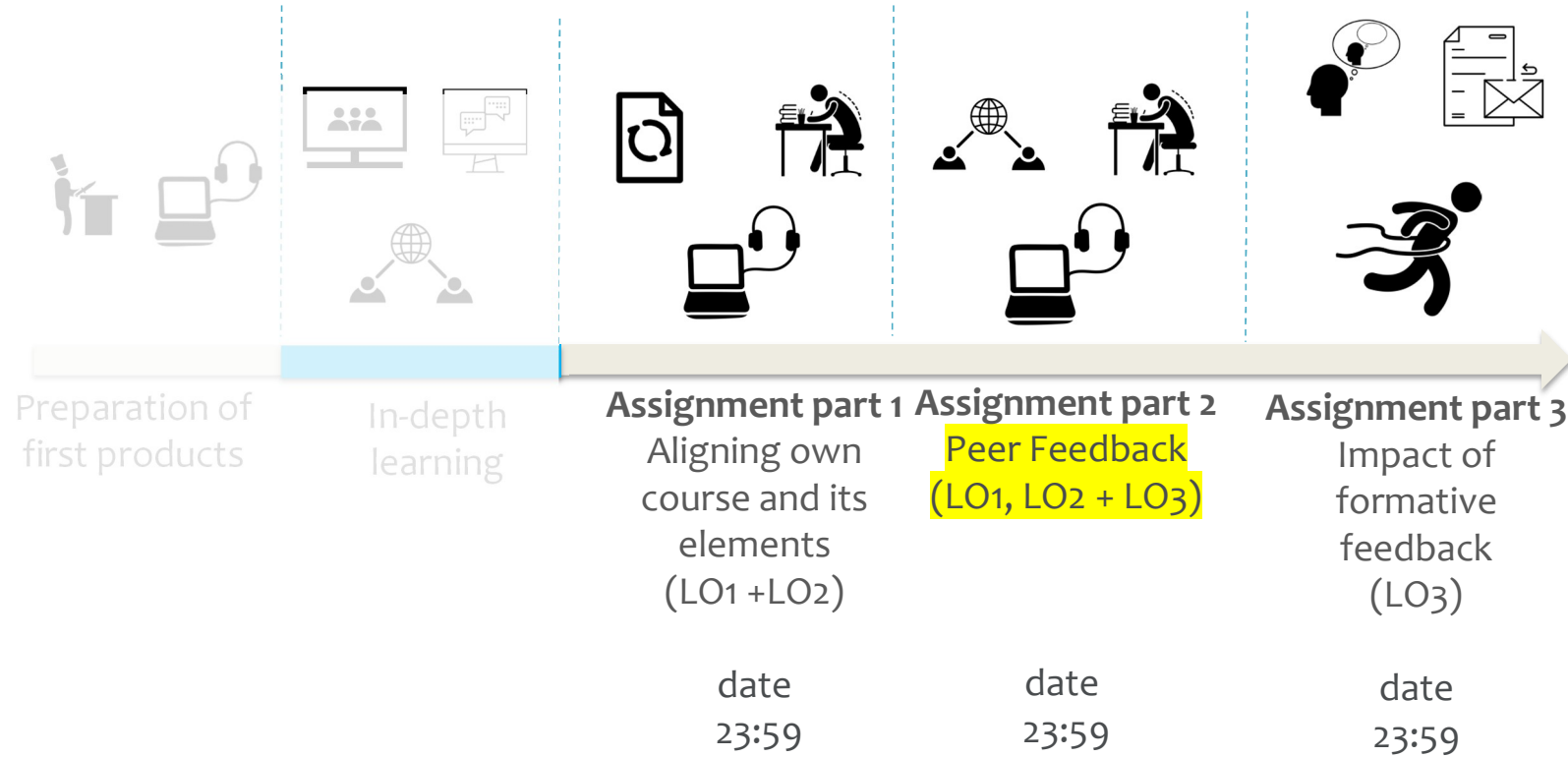
Teaching <u>and</u> Learning activities	Formative assessment and feedback	Summative assessment
<ul style="list-style-type: none"> • Reading on the technological development of surface facilities. • PowerPoint lecture: How to design a well • Pre-recorded video lecture (2 hours): Surface facilities for wells 	<ul style="list-style-type: none"> • Mobile quiz (Kahoot!): How to design a well and its surface facilities. • Q&A during lecture (20%). Based on how well the questions are answered. 	<p>Group presentation on one of the topics about wells (30%)</p> <p>Multiple choice exams:</p> <ul style="list-style-type: none"> • Final exam (50%)

4. What's next?

Constructive Alignment table... an example of 1 Learning Objective

Learning Objective		Bloom Level
At the end of the course the student will critically evaluate the role of human nature interactions in shaping everyday environments as well as in landscape architectural projects.		Evaluate
Teaching and Learning Activities	Formative Assessment	Summative Assessment
<ul style="list-style-type: none"> - students participate in a guided fieldwork session to practice and prepare for individual extended fieldwork. - students adopt a site (a terrain) close by the faculty, they observe and make interpretations on human nature interactions shaping this site (individual fieldwork, weekly observations), students document their findings and submit them weekly in a journal format. - students exchange their field observations and discuss them in group (every two weeks). 	<ul style="list-style-type: none"> -peer feedback after group discussion (according to framework provided by teacher). -weekly hand in of observations journal, followed by concise teacher feedback 	<ul style="list-style-type: none"> - 14% OF WHICH: - 8% written report in which students compile their conclusions visually + accompanied by an explanatory text (part of final assignment / design booklet)
Alignment justification		ARCS motivational strategies
<ul style="list-style-type: none"> - The mixed work form, and mixed knowledge gathering activities allow students to connect the theoretical concepts to field observation, field analysis and evaluation (which also increases relevance). The predominantly active and interactive teaching forms stimulate students' engagement and peer learning. - Frequent presentation and feedback sessions (teacher feedback in group / individual feedback by teacher / peer feedback) allow to monitor students' progress as well as keep them on track. 		<p>Attention – A broad variety of cases can increase students' attention.</p> <p>Relevance – working on well-known real-life cases connects the theory to their real-life situation.</p> <p>Confidence – clear instructions and roles before they start carrying out the learning activity.</p> <p>Satisfaction –The different homework will be useful for advancing with the final report (direct application).</p>

Next steps...



Recap

Student Motivation ✓

Constructive Alignment ✓

Learning Objectives ✓

Active Learning ✓

Formative and Summative Assessment ✓

Learning objectives

Do you feel that you are now able to:

- LO1: Formulate learning objectives according to the guidelines presented in the course?
- LO2: Determine activating learning activities and assessments for your own course or teaching materials in line with the principles of constructive alignment and student motivation?
- LO3. Explain to what extent giving and receiving peer feedback impacted on your learning?

Main take away

Q&A Forum for further questions / comments



.

Please complete the evaluation survey to help us improve this course in the future!

