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Method of Challenge Based Learning

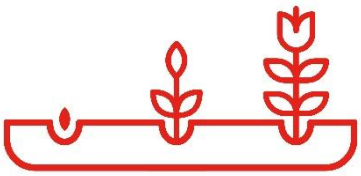
The essence of the Challenge Based Learning method is that students carry out projects related to solving relevant, real-world social problems, such as, for example, environmental problems, unemployment, helping disabled and excluded people for various reasons that are perceived as important from the students' perspective. In this way, students not only learn to design solutions, but also see the deep meaning of these activities and their causality. They therefore provide authentic challenges for the students, and these in turn provide motivation for action even if it were to extend beyond the time of classes themselves in the teaching rooms. However, this method can only be implemented when the students already have a general knowledge of the area (and should therefore rather take place in the higher years of study).

The method consists of 3 main phases (while it is cyclical and it is possible to return to earlier stages):

1. Engagement - involves translating a broadly defined idea into a challenge that the students want to tackle (an approach from a general problem to a specific problem, an object of action).This phase consists of three steps: defining the idea (also with the support of the academic teacher), defining the questions (the students' consideration of whether the phenomenon is important to them, how it affects them, how much it corresponds to their interests, etc.) and defining the challenge (solvable).
2. Investigation - this is the stage of research and recognition of the phenomenon necessary for the future action (from step 3) of designing solutions. At the beginning of this phase, students, with the support of the teacher, formulate the research questions to which they will seek answers. Then, they gather information from different sources and using different methods of cognition (e.g. observation, simulation, etc.), seeking answers to the questions. The final step is synthesis, which involves analysing the data and forming conclusions, which are presented, for example, in a report.

3. Action - involves designing solutions and implementing them. In this stage, students first design a concept of possible actions, then develop prototypes and test the solutions (however, at this stage it may turn out that new research questions arise, which motivates them to return to the investigation phase), and finally they start to apply the solutions in practice (e.g. implement specific actions for the local community) in order to obtain feedback and self-evaluation. The activities can then be developed (refined) and are presented, together with the conclusions, to the academic teacher and optionally to the other students.

In parallel, documentation, reflection and the presentation of solutions and receipt of systematic feedback take place during each phase.



The method allows for learning about the practicality of the issues discussed, supports the development of knowledge (also practical), skills useful in professional and private environments and the acquisition of social competences through teamwork. It is also possible to develop creativity, the ability to think critically both during and after the presentation of a solution, to attempt to take action (moving from an idea and concept to the implementation of a solution), to receive feedback from multiple perspectives and to refine solutions. In addition, students learn how to deal with failure (following the growth mindset).

Against the background of other methods, it is also important that not only the developed solution (the result of the efforts) is evaluated by the teacher, but also the process of its creation, which is documented by the student teams. It is therefore an opportunity for the teacher to observe the activities (also on an ongoing basis, depending on the idea of presenting the documentation), as well as a motivation for the students to work systematically throughout the semester. The teacher assumes a supportive and expert role and coordinates the students' activities.

Integrating Challenge Based Learning with other teaching methods

In order to plan the implementation of CBL in courses, it is worth considering how to organise individual teaching sessions, what activities students can perform outside of class, and what they should do in the classroom. During teaching sessions, in the process of guiding students to find creative solutions, you can use, for example:

- Brainstorming – the aim of brainstorming is to motivate students to generate many ideas, each of which is initially perceived as potentially good, and which are then evaluated and selected. Brainstorming is associated with an atmosphere of competition to come up with the best idea or its main part, and the freedom to propose potential solutions. Brainstorming can also be associated with acquiring the competence to present and argue one's ideas in order to convince others of one's proposal. A variation of brainstorming is the 635 variant, where students are divided into teams of six. Each team receives a sheet of paper for writing down ideas, divided into six parts (one for each person). Each student takes turns writing down three of their ideas on the sheet, which should take them five minutes.
- Snowball method – the aim of this method is to prepare the best solution to a problem by students or a common definition of a concept that is acceptable to everyone. At each

stage of the method, students write down their suggestions on small pieces of paper and place them in a drawn circle – the solution that is ultimately selected and accepted by everyone is placed in the centre of the ball. At the beginning, students generate their ideas individually, then work in pairs, in groups of four, etc. At each stage, students discuss their ideas together and select those that everyone can accept. The remaining ideas are gradually eliminated.

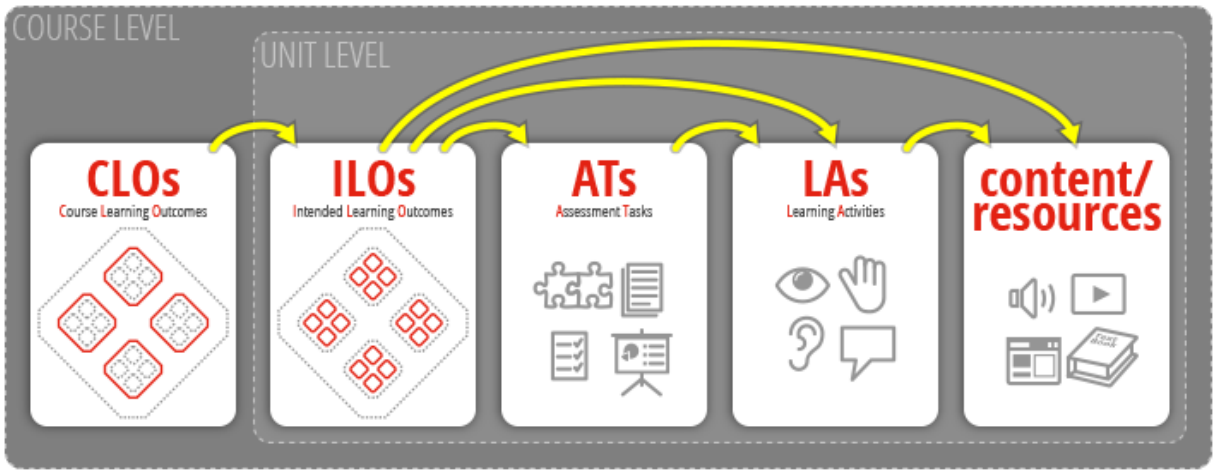
- SWOT analysis – students identify the strengths and weaknesses of individual proposals, as well as the opportunities and threats associated with their implementation. This helps in selecting ideas and solutions, but also allows students to prepare for the presentation of their ideas and anticipate questions and comments from others.
- Mind map – a mind map prepared by a single student or a group of students consists of visualising the connections between ideas, associations and keywords. Suggesting each keyword can give rise to new associations, ideas, etc. The map allows students to refine their ideas, prepare for their presentation, but also to organise their own chaotic thoughts.
- Decision tree method – students write down the defined problem, goals and values that guide them in searching for a solution to the problem, as well as 2 to 4 proposals for solving the problem on a prepared tree diagram. In order to jointly select the most reasonable solution, students then analyse the positive and negative consequences of each of the proposed solutions. After developing the decision tree, students present and justify their choice.
- The Metaplan method - it involves identifying the differences between the current and desired states for a given problem, understanding the reasons for this discrepancy, and developing a creative solution. Students therefore answer the questions ‘how is it?’, ‘how should it be?’, ‘why is it not as it should be?’, ‘what can be done to achieve the desired state?’ in turn. This method is particularly effective for controversial topics that are important to students.
- Ishikawa diagram – this method involves identifying the direct causes of a given problem and then understanding the factors that led to these causes. In the process of solving the problem, students arrive at its true source through in-depth analysis. On this basis, they propose a solution to the problem, addressing its root causes so that it can be prevented in the future.

Considering the number of hours of classes with students and the time available, the flipped classroom method can be considered – in this case, we provide students with resources to familiarise themselves with before class, and during teaching sessions, the work is active and workshop-based, while allowing the teacher to observe the students' work and provide ongoing support.

<u>Planning teaching sessions using the Constructive Alignment model</u>

In turn, the selection of specific teaching methods will influence the choice and need to prepare teaching materials for students, which can be taken to class or given to students for self-study or supplementation outside of class. This sequence of activities in preparation for the implementation of the Challenge Based Learning method in course corresponds to the structure of the Constructive Alignment model.

In the Constructive Alignment model, the intended learning outcomes are first defined, grouped classically into outcomes related to knowledge, skills and social competences (in general), and then specified at the level of course topics. Next, consideration is given to how the student's achievement of learning outcomes can be assessed (verified). Then, the student's tasks and educational activities (teaching methods) are defined, which the student should complete in order to pass the verification of learning outcomes. Finally, the tools used to perform the tasks (e.g. teaching materials, examples) necessary for the student to complete the tasks or implement the teaching methods are defined. This means that the Constructive Alignment model guides the academic teacher from the most general and basic educational goal, which is for the student to achieve the defined learning outcomes, to increasingly specific details.



Preparing the diagram: Beale Gurney, Nell Rundle

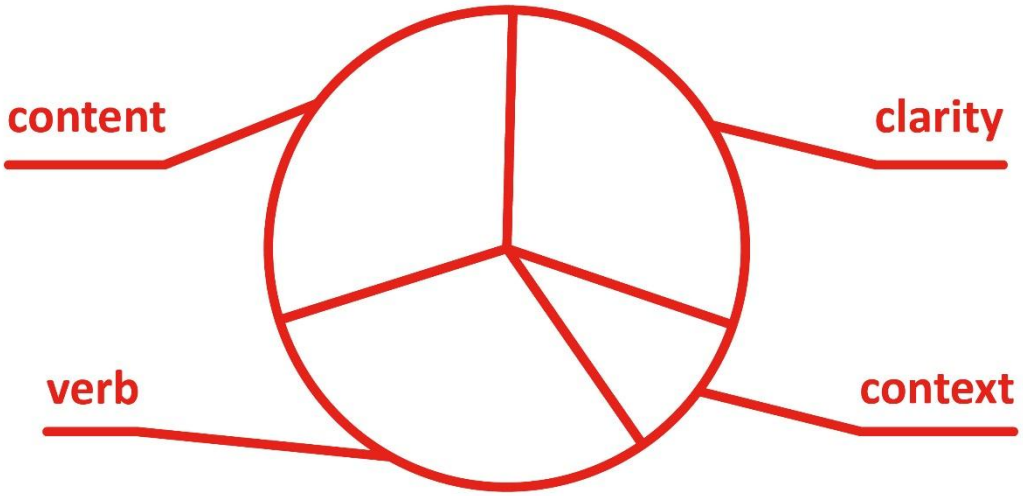
Source: University of Tasmania, Teaching & Learning Constructive Alignment, https://www.teaching-learning.utas.edu.au/unit-design/constructive-alignment [access: 2.02.2024]

In this context, ILOs become the basis for setting the objectives of individual teaching sessions and instructions for students.

ILO objectives should be clear (understandable) to the student and measurable. The ILO description should include:

- Verb – indicating whether the student is to observe, use, understand, explain, etc. – mandatory
- Content – specifying what the activity refers to (e.g. understand the relationship between X and Y) – mandatory
- Context - conditions for completing the task – e.g. in theory, in practice, during case study analysis – optional, but recommended

Clarity must also be ensured – the effect must be formulated in a way that leaves no doubt in the student's mind (the language must also be clear to someone who has never dealt with the subject area before).



In order to implement the Constructive Alignment model, the following questions should be answered for each learning outcome:

1. What are the general outcomes of the course?
2. What specific outcome should the student achieve within a particular topic?
3. On what basis will I determine that the student has achieved this outcome (what task must the student complete)?
4. What tasks or activities must the student complete in order to be able to cope with the assessment task?
5. What should I prepare for the student for these tasks or activities?

Assuming the implementation of the Challenge Based Learning method in courses, in terms of CLO we take into account the learning outcomes for the entire course, and in terms of ILO, the goals set for students at subsequent stages of the project (the individual stages are units from the above diagram). We then select assessment methods, forms of activity for particular classes (usually as methods of student activation and more broadly understood teaching methods) and the necessary resources.

Resources:

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