

CBL4UAV Photogrammetry

Phase 1

Engagement

2022

Why challenge-based learning?

Challenge Based Learning (CBL) provides an efficient and effective framework for learning while solving real-world challenges. The framework fuels collaboration to identify big ideas, ask thoughtful questions, and identify, investigate, and solve challenges. CBL helps learners gain deep subject area knowledge and develop the skills necessary to thrive in an ever-changing world [1].

Step 1: Big Idea

The process of challenge-based learning starts with a **Big Idea**;

What is the big idea: Big idea is a broad but engaging concept that forms the umbrella for the whole project activities. Under this umbrella, all the investigating, processing, and resulting work happens.

Think about what your connecting with the big Idea is your focus. Understanding how learning communities create added value to learning is critical in different ways across all content areas.

Big Idea

'UAV Photogrammetry for

Activity

Here a guideline is provided for your activities during the Investigate phase which you have to follow.

Step 2: Essential Questions

Having the Big Idea in mind, in the next step you have to contextualize and build personal connections towards the Big Idea: 'UAV Photogrammetry for'. The first practical step in this direction is "essential questions"

An essential question frames a topic as a problem to be solved. Essential questions are open-ended questions that can be answered from different perspectives. Context offers detail and restrictions to essential questions and their possible answers.

While considering essential questions, it is also important to identify the potential stakeholders (those who will be impacted by the project) perspectives, demands, requirements, and the environment in which the result will be used. You should think about the system surrounding the Big Idea, what relationships are part of its context? What are the system boundaries and connections to other systems?

Now, how to proceed?!!

- Start asking all kinds of questions to clarify the Big Idea, find the relevance to your discipline, and find out the many aspects related to the Big Idea.

- Start generating essential questions that reflect your interests, perspectives, and needs. It is essential that you have strong beliefs toward the Big Idea and your focus, if not, then choose another one.
- Think about the system surrounding the Big Idea, what relationships are part of its context? What are the system boundaries and connections to other systems?

McThighe and Wiggings (2013) provide the following conditions for developing an essential question. Based on this definition, an essential question is [2]:

- Open-ended which means that there will not be one single correct answer to the question
- Intellectually engaging (thought-provoking) which means that the essential question can easily spark a discussion or debate
- Calls for Higher-order thinking since the question cannot be answered by only recalling knowledge (Bloom's taxonomy)
- Elaborative and it will lead to important transferable ideas within and (in some cases) across disciplines
- Raises additional questions
- Requires justification, not just an answer
- Recurs over time, answers can be different at any specific time due to the circumstances and situation of that time

Assignment 1part 1: Essential Questions

1. **Develop/choose an/ essential question as a group.**

- The first step is identifying the stakeholders (relevant groups, companies, businesses, organizations, people, and individuals) who might be affected based on the concept of the project.
 - You can find an example by following this link: [Stakeholder Analysis \[3\]](#). But you may also come up with another way based on your experience and knowledge.
- Next, you will explore the question, each from a different perspective, and choose one of the key stakeholders you identified to consider their perspective which covers your own discipline the best.
- Meet with your team and your coach to discuss the results.

Expected Outcome

- a) Big Idea
- b) A list of stakeholders, distinguish between external and internal stakeholders and between direct and indirect influence.
- c) A brief overview of the perspectives of the stakeholders that were spoken with.

2. **Develop/choose individually at least five more essential questions**

- Select essential questions
- Share the questions with others on board for feedback
- Address the essential questions in a few sentences based on your perspective
- Gather as many different perspectives (use the stakeholder analysis from the previous assignment) as possible in the time you have, for each question.

Outcome

- a) At least one selected essential question
- b) A general list of resources (people, books, etc.)
- c) Reflect on whether certain perspectives have changed your considerations.

Format

Max 2 A4 pages.

Step 3: Challenge definition

The Challenge arises from the essential question, stated as a problem. The challenge is designed to address the Big Idea and the essential questions using the local learning community. Discuss the essential questions you selected within your group and with the stakeholder (if possible).

With all the (not structured) information you gathered by answering the essential questions, you can now start defining the problem.

It is important that you select a challenge that is actionable. This means that before you can write your challenge proposal you should at least be able to answer these (non-essential) questions:

- What is the key issue you are trying to address and why is it more important than other issues in your community?
- Is it clear enough for you that this challenge is worth the investment (time, interdisciplinary team effort, or money)?
- Are all stakeholders' perspectives taken into account?
- What social/cultural factors shape this problem?
- Is the problem actually real?

Assignment 1 part 2: Challenge Proposal

Write your Challenge proposal. Please submit a brief text with:

- Your names/group
- The problem you want to address (resulting in an actionable challenge)
- The challenge
- How the problem is unique or why has the problem is not addressed yet before (within your discipline)
- How the problem connects to the course competencies or Learning Objectives

- The need (for the community) that justifies this Challenge (the problem which will be solved)
- Sources of information that you used or consulted

Format

1 or 2 pages of A4

Assessment

Here you can find the rubric for the assessment of Engage phase activities.

Phase 1: Engagement rubric					
No.	Criteria	keys	Description	Score	Grade
1	Essential Questions	Meet the Criteria	Do the defined essential questions match the definition of essential questions	1.5	
		Cover the big idea	Are the questions in direction with the provided Big Idea		
2	Stakeholders study	Definition/categorization	The external and internal stakeholders are mapped out	2	
		Perspective	The perspective of stakeholders and the student background are considered		
		Analysis	Key, primary, and secondary stakeholder analysis		
3	Problem	Problem definition	The problem is a real problem that the community is faced	2.5	
		Impact	Is it clear who will affect by the result and how will they suffer from the problem		
		Complexity	Is it clear why the problem has not been addressed or solved before		
4	challenge	Actionable	The suggested solution can be done or an experiment	2.5	
		Doable	The challenge is doable concerning the time, stakeholders, resources, ...		
		Community perspective	It is clear from which perspective within the community the challenge is addressed		
5	Challenge proposal		The proposal is well-designed and written	1.5	

[1]. <https://www.challengebasedlearning.org/>

[2]. McTighe, J. & Wiggins, G. (2013). Essential questions. ASCD: Alexandria, VA.

[3]. <https://www.thegrassrootscollective.org/stakeholder-analysis-nonprofit>