



South Asia

Massive Open Online Course

Problem-Based Learning for Global Sustainability

This course is co-funded by the Erasmus+ Programme of the European Union.



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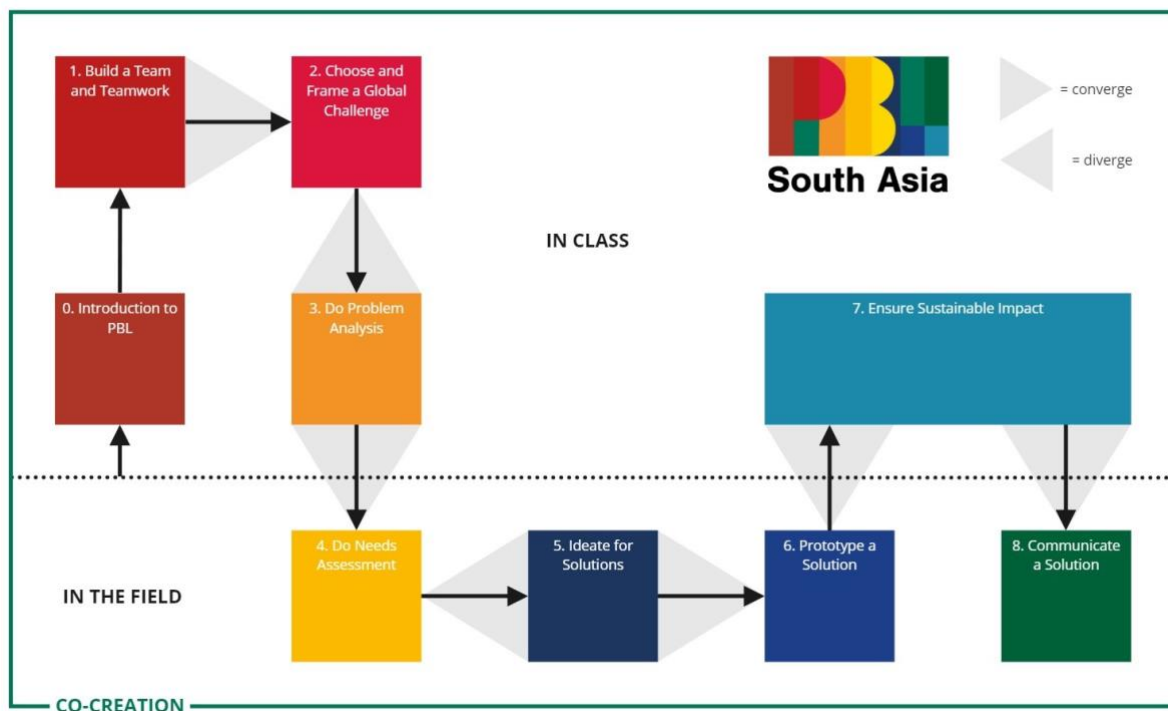


1. Course Overview

1.1 Introduction

You are most welcome to this Massive Open Online Course about Problem-Based Learning! This MOOC has been co-created by ten different Higher Educational Institutes in Europe and South Asia, and we hope that you will enjoy the PBL ride.

What is Problem-Based Learning? You will learn about it, and you will be able to put your learning into practice via this MOOC which will provide you with a selection of some essential theories, practical tools and real-world case examples to support problem-based learning trajectories around the globe and in your local context. Following the modules and applying the practical assignments in your own environment are the main activities throughout this course. A roadmap has been made to guide you in this exciting journey. As you can see in the roadmap we have some modules (0,1,2,3,7) that are customized for in class activities and some modules (4,5,6,8) that encourage the learner to work in the field. Obtaining real-world experience is one of the key components in this MOOC and to enable this we encourage you and your team to choose and specify a certain problem in module 3 and to use this case as the main threat for the rest of the modules.



This online course is co-created by:

AITM: Asian Institute of Technology and Management, Nepal

AU: Aalto University, Finland

IISc: Indian Institute of Science Bangalore, India

IITB: Indian Institute of Technology Bombay, India

JNEC/RUB: Jigme Namgyel Engineering College/Royal University of Bhutan, Bhutan

KTU: Kaunas Technical University, Lithuania

KU: Kathmandu University, Nepal

NEC: Nepal Engineering College, Nepal

SEC: Sagarmatha Engineering College, Nepal

TU Delft: Delft University of Technology, Netherlands

1.2. Learning objectives

The course is organized in 9 modules, the modules all build on the process from recognizing a problem to the stage of communicating a solution that could tackle the problem.

The overall learning objective is to get equipped with the Problem Based Learning method by learning from theories, practical case examples as well as group assignments in which you are asked to apply the different modules' tools to your own project.

The learning objectives for each specific module are as follows:

0. *What is PBL?*

- To gain a fundamental understanding of the 'Problem Based Learning' method
- To analyze the gap between traditional learning and PBL

1. *Build a Team*

- To acquire fundamental concepts of team building and its various aspects
- To understand and differentiate the different stages of team building
- To develop team-building attributes
- To understand the importance of co-creation in team building and teamwork

2. *Choose and Frame a Global Challenge*

- To identify, describe and frame challenges faced globally
- To identify and map various stakeholders involved with the global challenge at stake (with Co-create)

3. *Do Problem Analysis*

- To understand the role of problem analysis in PBL scenario
- To understand the philosophy/theories of problem analysis
- To develop an understanding on the tools involved in problem analysis
- To analyze the role of various stakeholders in problem analysis (Co-create)

4. *Do Needs Assessment*

- To assess the current and desired condition (needs and wants) of concerned stakeholders (Co-create)
- To evaluate the gap between current and desired condition of concerned stakeholders
- To address the need of concerned stakeholders

5. *Ideate for Solutions*

- To understand terminologies, such as ideation, generation, conceptualisation, idea, solution, concept, etc.
- To understand and apply ideation/conceptualisation methods to generate ideas for the chosen problems: empathy exercise, mind-mapping, brainstorming, etc.
- To remember method and create ideas and combine to form multiple solutions

- To understand and apply evaluation and selection methods with external stakeholders: SWOT analysis, Evaluation Matrix (Weighted-objectives)
- To remember, analyse and evaluate the solutions & select solution for prototyping

6. *Prototype your Solution*

- To understand what a prototype is
- To understand the purpose of building a prototype and the different types of prototypes
- To develop a prototype to test your problem-solution fit with relevant stakeholders (with Co-create)

7. *Ensure Sustainable Impact*

- To develop critical and holistic viewpoints towards sustainability concepts and understand its complexity
- To build know-how on ways of addressing and responding to global development, technology and related sustainability challenges
- To be able to discuss proposed sustainability solutions in both local and global contexts

8. *Communicate your Solution*

- To learn how to capture, disseminate and communicate the learnings and findings obtained during the PBL journey to different stakeholders
- To engage with/ participate in social issues with a lens on sustainability impact: different phases, actors, approaches, etc.
- To reflect on different types of results and assessments in PBL projects

1.3 What we expect from you

Participants don't need any prerequisites for this course.

We just expect you to be an active participant in this course, who contributes to a positive learning environment by questioning, sharing and helping out others, engaging in meaningful discussions so that we learn together.

On average, each module will require about 6 hours study time. In total you should be able to spend $9 \times 6 \text{ hours} = 54 \text{ hours}$ to complete the MOOC successfully.

This course is meant to be a place where you learn with, and from, others. In this regard, we would like you to experience collaboration and peer-feedback, so please make sure you follow with other participants in order to enrich the overall learning experience. Hence, make sure to access the forums in each module and complete all the assignments.

Please do respect the course policies of open.edu

1.4 What you can expect from us

Guidance and support will be provided on a regular basis. You can post your questions on the forums and get them answered by fellow learners or our team.

1.5 How to enrol for this online course?

TBA

2. Course Content

2.1 Overview of the modules

In this paragraph, a summary is given of each of the modules.

0. What is PBL?

The point of departure is a learner that doesn't know yet what is Problem-Based Learning. Therefore the first module handles the term and explains how the PBL method differs from the traditional educational method. It makes the learner aware of the differences and related attitude it requires from both the teacher and student. Highlights the need for a student-centred system of education based on developmental psychology. In traditional education questioning authority is still considered a taboo, which inherently leads to subjugation of oneself. Traditional education is more like 'talk and chalk' meaning that the teacher talks to the class what needs to be absorbed by the student by chalking the same information. With problem based learning the teacher takes the role as a coach and process manager as it activated the students to develop their own insights when learning by doing in a process of getting from real life problem analysis to solving these problems.

Now you know what is PBL you may want to experience it so are you ready for the first step in PBL? The first step in PBL however is not to start with the problem but to start with you and your team as the PBL method demands team work. Why not working by yourself? As the saying goes 'If you want to go fast, go alone, if you want to go far, go together. When working in teams, learners can achieve great insights by learning together with their peers. You will learn what it means that $1+1=3$.

1. Build a Team

This module highlights the characteristics and the advantages as well as the challenges of working in (diverse) teams. You will be introduced to various forms of collaboration.

Also it gives insights in the five stages of team building and how teams achieve goals collectively and the various challenges involved at every stage. You will get examples of traits that make the most successful teams doing effective work.

In the current world with wicked challenges, working together is key, not only with your team but also with relevant stakeholders. Therefore one must learn about all actors involved. How to choose and frame a global challenge is key in the next module.

2. Choose and Frame a Global Challenge

This module helps you and your team to identify, describe and frame challenges faced globally. What are global challenges, which one will you work on and which actors are linked to the challenge of your choice? You will identify and map stakeholders that are linked to a global challenge.

On a macro-level you now know a bit more about the challenge you would like to tackle. In the next module you will zoom in more to the problem details that you will be working on.

3. Do Problem Analysis

With this module you will learn how to do problem analysis. It introduces the concept of co-creation and mentions the importance of stakeholders' in doing proper problem analysis for solving challenges. Some problem analysis tools are explained such as the 5 WHY-tool, for you to try out at least one for your project.

Now you know more details of the problem and the related stakeholders, it is time to start selecting one user (group) and to learn more about this user by doing a needs assessment.

4. Do Needs Assessment

In this module you are introduced to practical guidelines to do a needs assessment in a 3 step process. Gathering and analysing data skills are explained as well as the role of stakeholders involved in the process.

So far, you have done a lot of research on the problem at stake. You know more about the user you would like to target but with what solution? In the next module you will start the ideation process to get to know what would be a good solution for the problem you are working on.

5. Ideate for Solutions

In this module you will be equipped with some ideation tools that stimulate creative thinking to get multiple ideas that can potentially become the solution for your project. Also the role of the user and other relevant stakeholders are addressed to help you finding and selecting the best solution to take with you to the next step.

Congratulations, you have found a solution to tackle a wicked problem! Let's see how this solution works out in practice. Before you start building your solution, you have to validate if the solution will really work according to you and other actors involved.

6. Prototype your Solution

With this module you get insights in what a prototype is, and what the purpose is of building a

prototype and minimum viable product. You get introduced to tools related to (rapid) prototyping, such as the napkin sketch and paper prototyping exercise. You will develop your prototype and test it within your team and with relevant stakeholders. Through the interactions you will obtain new insights and you can go back to the drawing table to adjust your solution according to the user demands.

The solution is becoming more and more tangible, you are almost ready for communicating your solution! But first you have to think through how you will make sure you operate in a sustainable manner. How you do this will become clear in the next module.

7. Ensure Sustainable Impact

In this module you are introduced to the concept of sustainable impact. What is it and how can you measure it and take actions to achieve more of it? Only good intentions are not enough so you are encouraged to critically reflect on your solution and its potential impact on a global scale and in the local context.

Once you have figured out how you can ensure sustainable impact, you are ready for the last (but not least!) step: communicate your solution.

8. Communicate your Solution

This module how to present the solution to stakeholders. What constitutes a good presentation? Furthermore you learn about the necessity for leaders to lead effective change management. It advocates 7 strategies leaders could form to achieve this for their teams.

2.2 Structure of each module

Each of the modules follows a similar structure.

- Introduction to the module. Here you can read the learning objectives with a short explanation of what the module is about
- Prepare for class. Get yourself ready for class! What materials do the learners need to read? What videos to watch? In some modules, you can even do a self-assessment by answering quiz questions
- In-class videos. When you will be in class, these videos will be used for explaining theory and practical examples and to provide you with instructions
- Team work assignment. For each module you will get a team work assignment, see also the assessment table with more information about the grading. Throughout the MOOC you will work on the same problem as you will identify in module 3.

3. Course Planning

TBA

4. Course Assessment

For most of the modules you are required to read literature, watch a video and do group work assignments. Kindly prepare yourself by going through all the prescribed materials before going to class.

Throughout the course there are opportunities for doing non-graded and graded assessment. The non-graded (formative) assessment tools are for example quizzes and self-assessment activities. These help you to learn and evaluate how you are doing and what you might want to study a bit more. For the graded (summative) assessment you can read the table below for more details. The grading will happen with use of peer-review assignments.

Module	Assessment	Weight
1. Build a Team	Create a Team Contract + Team Picture	10%
2. Choose and Frame a Global Challenge	Select and depict your Global Challenge	10%
3. Do Problem Analysis	Describe your Problem + its root cause	10%
4. Do Needs Assessment	Make an Empathy Map	10%
5. Ideate for Solutions	Generate ideas using the brainstorming method. Combine ideas into the concepts using a morphological chart, and select the final solution using the weightage objective method.	10%
6. Prototype your Solution	Develop a prototype to test your problem-solution fit	10%
7. Ensure Sustainable Impact	Make an impact pathway for your project	10%
8. Communicate your Solution	Prepare a presentation to promote your project	10%
All modules combined	Present your project (max 10 minutes)	20%

5. Contact

For remarks and questions, we ask you to use the discussion forum of the open.edu platform or to ask your teacher.

- Survey for HEIs before the course: https://docs.google.com/forms/d/1mevIRVRr8leX8x4iHv-GhRk_AUIfkQN93rNcpcJ9sw/edit?usp=sharing

- Survey for HEIs after the course: https://docs.google.com/forms/d/1Oi2mqWLSRosPzUG8UPj13xPaDDpmtNH-2uxNxBsW_KA/edit?usp=sharing