UNIC

CHALLENGE-BASED LEARNING

UNIC TEACHING GUIDE
FOR UNIVERSITY EDUCATORS

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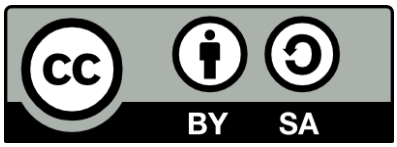

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IN A NUTSHELL

Challenge-Based Learning (CBL) is a **multidisciplinary approach** in higher education that engages students with **real-world issues** through **collaboration** with peers, educators, and external stakeholders. This process involves three iterative phases: **engage, investigate, and act.** CBL benefits students by **enhancing motivation, skill development, and understanding of their professional fields.** For educators, it offers valuable opportunities for **professional growth.** Finally, universities strengthen **their integration with local social actors, contributing to urgent societal matters.**

What is Challenge-Based Learning?

Challenge-Based Learning (CBL) is a multidisciplinary approach to teaching and learning in higher education (HE) that engages students with authentic, real-life issues. These challenges are addressed through co-creation and collaboration with peers, teachers, and (external) stakeholders in their (local) communities and beyond.

> CBL's solution-oriented learning environments are **diverse and inclusive**, encouraging students and teachers to think critically, take action, and reflect on established theories and research.

In **UNIC**, Challenge-Based Learning serves as an umbrella term. At Malmö University, CBL has been part of the strategy since 2013. Erasmus University Rotterdaam has advocated for Impact-Driven Education since 2019, which shares many similarities with CBL. The "Develop Your Entrepreneurial Skills - Challenge-Based Teaching Formats for Innovative University Teaching" project at Ruhr University Bochum laid the foundation for integrating CBL into teaching. Across HE institutions within and outside UNIC, other terms like **'action-based learning'** or **'case method teaching'** are used, often referring to teaching and learning methods that share elements with CBL.

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Compared to more established traditions such as **Problem-Based Learning (PBL), Project-Based Learning (PjBL),** and **Service Learning (SL),** CBL stands out in the following ways:

PBL

Problem-Based Learning (PBL): Unlike CBL, problems in PBL can be purely hypothetical, and the solution is often already known to the teacher.

Project-Based Learning (PjBL): The problems students engage with are generally fictional. PjBL projects are typically more open-ended than PBL projects but are still more predictable in their outcomes than CBL and more predefined than CBL tasks.

PjBL

SL

Service Learning (SL): The problem in SL is usually defined by an external stakeholder, with the university providing a service to help solve it. In contrast, CBL gives students greater influence over project design—they are not merely serving an external institution but are actively involved in co-creating the problem definition with societal partners.

How can I implement Challenge-Based Learning in my course?

The implementation of CBL at the course level consists of three main phases. However, during project execution, these phases are often cyclical, meaning the CBL team may revisit earlier stages to re-evaluate and refine their approach.

ENGAGE | INVESTIGATE | ACT | REFLECT

ENGAGE

This phase involves meeting the external stakeholder, understanding their concerns, and translating a broadly defined urgency into a **challenge that students can tackle, relate to, and feel excited about.** The involvement of both the external stakeholder and the teacher is crucial to ensure that the challenge remains connected to the stakeholder's original urgency. This prevents students from choosing a superficial challenge with minimal learning benefits or, conversely, a challenge too complex to address meaningfully within the given timeframe.

INVESTIGATE

In this phase, students explore the challenge in depth, gathering **information from various sources** (e.g., academic articles, organizational reports, community websites) and using **diverse research methods** (e.g., observations, interviews, questionnaires). Integrating theoretical and practical insights from multiple perspectives and disciplines is key for developing a **well-rounded understanding of the issue.**

ACT

Students develop their own proposals to tackle the challenge, prototype their ideas, and test their solutions. They receive feedback from teachers, peers, and societal partners throughout the process. The creative output can take various forms depending on the field—such as policy recommendations, marketing campaigns, or social interventions. **The final proposal should be both useful to the societal partner and academically sound**, demonstrating a solid grounding in the knowledge and skills acquired during the course.

REFLECT, DOCUMENT, AND SHARE

Throughout the process, students document their journey using journal entries, audio recordings, images, and other formats. **This ongoing documentation serves as a valuable resource for reflection and assessment.**

Steps in the CBL method

Source of the graphic element: Challenge Based Learning, Framework, https://www.challengebasedlearning.org/framework/ [access: 21.03.2025]

How can I implement Challenge-Based Learning in my curriculum?

Implementing Challenge-Based Learning (CBL) at the curriculum level requires careful consideration of the following five aspects, detailed in the next page.

GRADUAL CURRICULUM INTEGRATION

As an educational innovation, CBL should be implemented gradually. It may begin as an elective or minor and eventually become part of mandatory courses. Not every course needs to adopt CBL; its use should align with the course's learning objectives. **However, most students should engage with CBL during their education due to its benefits in skill development and societal engagement.** While traditionally more common in medical and engineering education, CBL is relevant across all disciplines. It can be adapted to diverse subjects and learning contexts, including research universities and universities of applied sciences.

PROGRESSIVE STUDENT ENGAGEMENT

When are students ready for CBL? Students can begin engaging with elements of CBL as early as their first year of study. This may include working in groups, structuring projects, and conducting interviews with stakeholders on social issues. **These foundational experiences help students gradually build the skills and knowledge needed for fully developed CBL courses**, typically introduced later in bachelor's programs and at the master's level.

EFFECTIVE STAKEHOLDER COLLABORATION

CBL relies on collaboration with external stakeholders who present real-world challenges. Students work alongside them to co-create new perspectives and initiatives, fostering mutual learning. Since both parties invest time and resources, ethical and reciprocal relationships are essential. **Clear expectations and agreements are key to success.** To ensure long-term impact, CBL should prioritize sustainable partnerships rather than one-time collaborations.

TEACHER PREPARATION AND SUPPORT

In CBL, the teacher serves as a facilitator rather than the sole expert who has all the answers. Groups of students work with significant autonomy, while the teacher provides guidance by introducing illuminating theories and models, useful tools, interesting case studies, and detailed feedback on their progress. This shift in teaching approach requires competencies in group dynamics, project management, and feedback delivery. **To successfully implement CBL, institutions should offer teacher training, support from educational staff, and communities of practice for sharing challenges and lessons learned across faculties and programs.**

ASSESSMENT ALIGNED WITH CBL PRINCIPLES

Traditional high-stakes exams are not well-suited to CBL. Instead, **integrative, portfolio, or programmatic assessment methods are more appropriate.** Communication, teamwork, and other essential skills should be explicitly included in learning outcomes and evaluated throughout the course. Since students encounter setbacks and discover new directions—key aspects of the creative process—assessment should focus not only on final products but also on the learning process of the team.

Who is my societal partner?

Partners play a crucial role in Challenge-Based Learning (CBL). They can come from within the university, such as student welfare agencies, job support services, alumni, or long-term faculty collaborations. Even students' personal networks can serve as valuable connections. However, **partners are often external and may include city councils, local philanthropies, healthcare institutions, NGOs, SMEs, corporate enterprises, neighbourhood representatives, and political organizations.**

To build strong and effective partnerships, three key aspects should be considered:

1. **Managing Expectations** – Clear expectation management is key when collaborating with external partners. It is important to communicate what they can expect from students' solution ideas, which may have limitations as students are engaged in a learning process.

2. **Reciprocity** – Stakeholders' time and resource investment should be acknowledged. Reciprocity can take various forms, such as connecting them with other partners, inviting them to seminars and networking opportunities, or offering financial compensation when appropriate.

3. **Sustaining Partnerships** – Societal partners may experience "research fatigue" when multiple courses or universities frequently reach out to them. To avoid overburdening partners, maintaining an organized overview of collaborations is ideal. Partnerships can be categorized by themes such as health, migration, or technology, ensuring a balanced and strategic approach to long-term engagement.

Why should I engage in Challenge-Based Learning?

Challenge-Based Learning offers unique benefits for students, teachers, and universities on different levels:

Students Preparation for Working Environments

CBL exposes students to the reality that real-life issues often require input from multiple academic disciplines and collaborative approaches, preparing them for **interdisciplinary work environments.** They get to know first-hand diverse working themes and settings within their field, helping them **develop their own professional identity and career goals.** Moreover, they can get relevant connections to kickstart their careers.

Student Engagement

Students learn to apply abstract, general concepts to real-world situations and work with actual stakeholders with whom they develop a true connection. This **empowers students in their own knowledge and skills and increases their engagement,** preventing drop-outs.

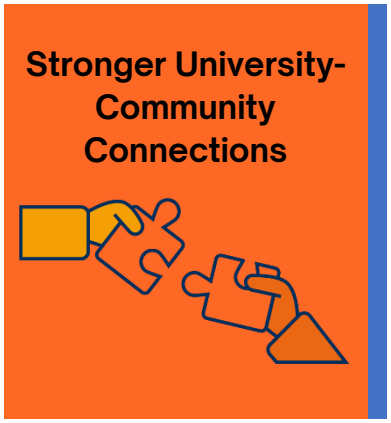
*"I think an advantage of working with societal partners is that **you really apply what you learn to a real-life scenario** which makes it all a lot **more interesting**. It also makes me **more motivated** to deliver high quality work **because I know someone will actually use it**" (Student Health Psychology Master, Rotterdam)*

Teacher Professional Growth

Working with highly motivated students provides an ideal setting for implementing successful teaching activities, fostering discussions, and creating an engaging learning environment. **Moreover, CBL allows teachers to explore new roles, such as coaching, and build closer connections with students**. The collaboration with external partners strengthens their professional networks and keeps them informed about current trends and challenges in the workforce, allowing them to integrate these insights into their teaching and research.

Establishing relationships with local partners enhances the university's integration with different social actors. This can create job opportunities for students, new research opportunities for teachers, and broader societal impact.

'Challenge-Based Learning helps not only to bring knowledge and learning from universities to our cities but also to bring the great challenges our cities are facing into the heart of university teaching and learning.' (UNIC 2.0 proposal, p.10)



Where can I get help?

Your local Centre for Teaching and Learning offers support and advice in related to Challenge-Based Learning. In UNIC, all CTLs can be contacted via the UNIC CTL Information Hub.

The UNIC Centre for City Futures is the "one-stop-shop" for universities to engage with cities and communities. Get in touch to find challenges of your city and cooperation partners.

Resources and Further Reading

Examples of CBL implementation:

Applied Psychology and Lets Grow Together
https://youtu.be/3YPZY8Bw0Jw?si=-s1-qThJ6Y0_kJCg [access: 20.03.2025].

Microbiology and Green Campus
https://youtu.be/sNILQ-9ieKU?si=JliUCu41F-54affV [access: 20.03.2025].

TU Eindhoven, *Why choose TU/e Graduate School?*, https://www.youtube.com/watch?v=H3tlD7zs8Wo [access: 20.03.2025].

University of Stavanger on YouTube, *Challenge-based learning at ECIU University*, https://www.youtube.com/watch?v=tlMpsj5quy0 [access: 20.03.2025].

Clemens Verhoosel, *Challenge-Based Learning at TU/e Mechanical Engineering* – FULL VIDEO, https://www.youtube.com/watch?v=zEh2KiC4d4E [access: 20.03.2025].

Other links:

Civic Engagement Toolkit
www.ucc.ie/en/cirtl/resources/cetoolkit/ [access: 20.03.2025].

Challenge Based Learning,
https://www.challengebasedlearning.org/ [access: 20.03.2025].

Digital Promise, Introduction to Challenge Based Learning, https://www.youtube.com/watch?v=NVokMxk56nQ&t=12s [access: 20.03.2025].

University of Twente / Universiteit Twente, Challenge-based learning in practice (CBL), https://www.youtube.com/watch?v=CFCSvvsPWUA [access: 20.03.2025].

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D. Guadalupe Charles Estrada, Competency Development Through Challenges, 22.07.2019, https://observatory.tec.mx/edu-bits-2/competency-development-through-challenges/ [access: 21.03.2025].

Tecnológico de Monterrey, Institute for the Future of Education, BeChallenge: Challenge-based learning to revolutionize learning and training, 13.05.2019, https://observatory.tec.mx/edu-news/bechallenge-challenge-based-learning-to-revolutionize-learning-and-training/ [access: 21.03.2025].

Further Reading:

S. Bou Ysás, C. Carretero González, P. Castro González, A. Echániz Barrondo, L. Hassi, Aprendizaje basado en retos, Cuadernos de Pedagogía Ignaciana Universitaria, Unijes Universidades Jesuitas, Proyecto PE5, Universidad Pontifica Comillas, 2022.

Challenge Based Learning, EduTrends, Observatory of Educational Innovation Tecnológico de Monterrey, October 2015.

M. Nichols, K. Cator, M. Torres, Challenge Based Learner User Guide, Redwood City, CA: Digital Peomise, 2016.

Apple, Challenge Based Learning. A Classroom Guide, 2010.

C.E. Christersson, M. Melin, P. Widén, N. Ekelund, J. Christensen, N. Lundegren, P. Staaf, Challenge-Based Learning in Higher Education: A Malmö University Position Paper, International Journal of Innovative Teaching and Learning in Higher Education, Vol. 3, Issue 1, DOI: 10.4018/IJITLHE.306650.

S.E. Gallagher, T. Savage, Challenge-based learning in higher education: an exploratory literature review, Teaching in Higher Education, 26 December 2020, Routledge Taylor & Francis Group, DOI: 10.1080/13562517.2020.1863354.

M. Magnell, A-K. Högfeldt, Guide to challenge driven education, ECE Teaching and Learning in Higher Education no 1, KTH Vetenskap Och Konst.

Erasmus University Rotterdam (EUR), Impact-driven education at Erasmus University Rotterdam, Impact at the Core, February 2023.

M. Leijon, P. Gudmundsson, P. Staaf, C. Chistersson, Challenge based learning in higher education – A systematic literature review, Innovations in Education and Teaching International, 19 March 2021, Routledge Taylor & Francis Group, DOI: 10.1080/14703297.2021.1892503.