



ENTER-CBL

**Boosting Entrepreneurial Mindset of Students
with Challenge-Based Learning**

Digital training material for teachers

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Boosting Entrepreneurial Mindset
of Students with Challenge-Based Learning

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WP 2.2 RECOMMENDED READINGS ON CBL METHODOLOGIES AND INTERDISCIPLINARY COLLABORATION

This document encompasses educational content delivered through a variety of media formats, such as videos and podcasts, all rooted in the principles of CBL methodology and practices. Aimed at providing an interactive and immersive learning experience, these resources utilize the dynamic capabilities of multimedia to deepen learners' understanding of the CBL framework. By illustrating both theoretical concepts and practical applications, this multimedia approach serves diverse learning styles and encourages the exploration of CBL's practical aspects, thus fostering enhanced problem-solving capabilities and teamwork skills in real-world settings.

Building on this foundation, the document also presents a suite of digital training materials specifically designed for educators. This includes a wide range of audiovisual content, textual materials, guidelines, and comprehensive toolkits that address the core aspects of CBL methodology. Covering the theoretical underpinnings (encompassing theories, concepts, and frameworks), the potential benefits and challenges of applying CBL in educational settings, the key elements, and tools integral to CBL, as well as detailed procedures and workflows for its implementation, these resources aim to equip teachers with the knowledge and skills required to effectively incorporate CBL into their teaching practices. Furthermore, the inclusion of firsthand experiences from educators who have successfully implemented CBL methodologies offers invaluable insights and real-world perspectives on the transformative potential of CBL in the classroom.

C. WEBSITES

Website 1: Challenge Based Learning

- <https://www.challengebasedlearning.org>
- CBL Toolkit: <https://www.challengebasedlearning.org/toolkit>
- CBL Framework: <https://www.challengebasedlearning.org/framework>

This is the official website for CBL, providing general information, resources, implementation examples, and research on CBL. It includes guides and strategies for educators looking to apply CBL in their teaching practices.

Website 2: George Lucas Educational Foundation

- <https://www.edutopia.org>

Edutopia is a comprehensive resource for innovative teaching methods. You can find articles and videos about BPL or similar educational models on this site.

Website 3: Buck Institute for Education (BIE) – PBLWorks

- <https://www.pblworks.org>

This website specializes in PBL but also shares concepts and methodologies that overlap with CBL. The site offers numerous resources for teaching strategies and projects.

Website 4: Digital Promise Challenge Based Learning

- <https://digitalpromise.org/initiative/cbl>

This page offers detailed information about Challenge Based Learning, including case studies and guidance on how teachers can implement this learning approach.

Website 5: Apple Education

- <https://education.apple.com/learning-center/R006554>

Apple has been a proponent of Challenge Based Learning and has supported resources and toolkits that can be very useful for educators looking to implement this methodology.

Website 6: University of Delaware PBL

- <https://sites.udel.edu/pblworkshop>

The University of Delaware has been a leader in promoting Problem-Based Learning, especially in higher education. Their website offers numerous resources, including tutorials, problems from various disciplines, and assessments tailored to PBL environments.

Website 7: Illinois Mathematics and Science Academy - Problem-Based Learning Network

- <https://www.imsa.edu/educator-development/problem-based-learning>

IMSA's Problem-Based Learning Network provides a platform where educators can access resources, find training, and connect with other educators to discuss and develop PBL strategies.

Website 8: University of Twente

- <https://www.utwente.nl/en/cbl>

The university's commitment to interdisciplinary research and education fosters an environment where students can engage deeply with global issues, utilizing cutting-edge technology and collaborative projects to devise practical, impactful solutions.

Website 9: Eindhoven University of Technology

- <https://www.tue.nl/en/education/why-study-at-tue/challenge-based-learning>

Eindhoven University of Technology is at the forefront of incorporating CBL into its educational model.

Website 10: Dublin City University

- <https://www.dcu.ie/teu/challenge-based-learning>

According to DCU, Challenge-Based Learning (CBL) is a process of collaborative engagement with peers, academics, and stakeholders to develop solutions to real-world social, technological, environmental, and economic challenges of urgency and significance.

Website 11: Università di Trento

- <https://www.soi.unitn.it/challenge-based-learning/>

The Università di Trento embraces CBL as a core element of its educational philosophy, particularly within its School of Innovation. This approach encourages students to engage directly with real-world problems, combining interdisciplinary knowledge and collaborative teamwork to develop innovative solutions.

Website 12: Times Higher Education

- <https://www.timeshighereducation.com/campus/challengebased-learning-design-and-delivery-undergraduate-courses>

Times Higher Education provides a comprehensive exploration of CBL in the context of designing and delivering undergraduate courses. This resource serves as an invaluable guide for educators and academic institutions looking to integrate CBL into their curriculum.

B. VIDEOS

Video 1: Explained: Challenge-based Learning | 1:55 min |

- https://www.youtube.com/watch?v=MyiFPIJivPY&ab_channel=UniversityofTwente%2FUniversiteitTwente

Video 2: Challenge Based Learning in Practice (CBL) | 4:03 min |

- https://www.youtube.com/watch?v=CFCSvvsPWUA&ab_channel=UniversityofTwente%2FUniversiteitTwente

Video 3: CBL: Framework Overview | 4:18 min |

- https://education.apple.com/learning-center/T052487A-en_EMEIA?backTo=%2Flearning-center%2FR006554%3FbackTo%3Dhttps%3A%2F%2Feducation.apple.com%2Fforum%2Fapple-groups%2Fchallenge-based-learning

Video 4: Engage: Create Your Own Challenge | 5:42 min |

- https://education.apple.com/learning-center/T052488A-en_EMEIA?backTo=%2Flearning-center%2FR006554%3FbackTo%3Dhttps%3A%2F%2Feducation.apple.com%2Fforum%2Fapple-groups%2Fchallenge-based-learning

Video 5: Investigate: Participate in a Challenge | 7:14 min |

- https://education.apple.com/learning-center/T052489A-en_EMEIA?backTo=%2Flearning-center%2FR006554%3FbackTo%3Dhttps%3A%2F%2Feducation.apple.com%2Fforum%2Fapple-groups%2Fchallenge-based-learning

Video 6: Act: Create and Implement Your Solution | 5:38 min |

- https://education.apple.com/learning-center/T052490A-en_EMEIA?backTo=%2Flearning-center%2FR006554%3FbackTo%3Dhttps%3A%2F%2Feducation.apple.com%2Fforum%2Fapple-groups%2Fchallenge-based-learning

Video 7: Document, Reflect and Share: Facilitate the CBL Process| 3:38 min |

- https://education.apple.com/learning-center/T052491A-en_EMEIA?backTo=%2Flearning-center%2FR006554%3FbackTo%3Dhttps:%2F%2Feducation.apple.com%2Fforum%2Fapple-groups%2Fchallenge-based-learning

Video 8: Challenge Based Learning: an overview | 20:44 min |

- https://www.youtube.com/watch?v=MH0xbc-xMNI&ab_channel=ESU8WednesdayWebinars

Video 9: Challenge Based Learning - An Introduction | 7:24 min |

- https://www.youtube.com/watch?v=_zQODH4b0Aw&t=9s&ab_channel=NSS

Video 10: What is Challenged Based Learning? | 3:27 min |

- https://www.youtube.com/watch?v=JlBbT8I49oI&t=2s&ab_channel=MCSDMiddies

Video 11: Ciena Solutions Challenge Quick Tip: Introduction to the Challenge and the CBL Framework | 2:57 min |

- https://www.youtube.com/watch?v=QP5sicZR-qo&ab_channel=DigitalPromise

Video 12: Challenge vs Problem Based Learning | 36:59 min |

- https://www.youtube.com/watch?v=XhyWuenuEeY&ab_channel=DiscoveryEducation

Video 13: What is Problem Based Learning | 5:03 min |

- https://www.youtube.com/watch?v=RGoJIQYGpYk&t=5s&ab_channel=JohnSpencer

Video 14: Problem Based Learning | 16:13 min |

- https://www.youtube.com/watch?v=-iwV9LjZwm8&ab_channel=NCFE

Video 15: The Advantages of Challenge-Based Learning | Tomorrow University of Applied Sciences | 1:39 min |

- https://www.youtube.com/watch?v=mtYIuqun4nk&ab_channel=TomorrowUniversityofApplied-Sciences

Video 16: Brain-On-Chip: Challenge Based Learning (CBL) course | 4:05 min |

- https://www.youtube.com/watch?v=08pTD1a03CY&ab_channel=TUEinnovationSpace

Video 17: Introduction to Team Based Learning | 8:47 min |

- https://www.youtube.com/watch?v=aZd4GBdiwY4&ab_channel=LAMS

Video 18: Challenge based learning: The learning process | iMooX | 7:55 min |

- https://www.youtube.com/watch?v=IEPbt8-OQGQ&ab_channel=iMooXat

Video 19: Challenge based learning: Input, assessment, benefits and drawbacks | iMooX | 7:55 min

- https://www.youtube.com/watch?v=VDBQ-pYD2gI&ab_channel=iMooXat

Video 20: Challenge Based Learning in Higher Education” | iMooX | 3:22 min |

- https://www.youtube.com/watch?v=RoKZe6hF5bw&ab_channel=iMooXat

Video 21: Testimonials: Role of a teacher in a CBL activity | iMooX | 2:37 min |

- https://www.youtube.com/watch?v=zj8UnJ2R5cA&list=PLhy2nHJciTEDB2Jl69cN5JnEBk-CLkriP7&index=9&ab_channel=iMooXat

C. PODCASTS

Podcast 1: Improving Student Collaboration in Remote and Hybrid Learning | 22:53 min |

- <https://spencerauthor.com/remote-collaboration/>

Podcast 2: Chapter 5: Challenge Based Learning: A Future Full of Challenges | 35:28 min |

- <https://open.spotify.com/episode/4tGeaXPG7DfzpxrGutJPxm>

Podcast 3: Chapter 4: Challenge Based Learning: A Future Full of Challenges | 41:23 min |

- <https://open.spotify.com/episode/1P4XuL1t1mOqHrxYHgrtA>

Podcast 4: Problem Based Learning Gaby Barreto and Jennifer Choi | 47:49 min |

- <https://open.spotify.com/show/5GplTBibODWqAhsHpdXfeu>

Podcast 5: Challenge Based Learning (ECBO) | 29:18 min |

- <https://open.spotify.com/episode/0mYFMEPJrq1RijKAcpDNwl>

- https://music.youtube.com/watch?v=MG_dCELwZuo&si=19iA7rjPzDLj0gK0

D. ARTICLES

- [1] Cheng, W. L. (2016). Application of Challenge-Based Learning in nursing education. *Nurse Education Today*, 44, 130-132. <https://doi.org/10.1016/j.nedt.2016.05.026>
- [2] Doulougeri, K., Vermunt, J. D., Bombaerts, G., & Bots, M. (2024). Challenge-based learning implementation in engineering education: A systematic literature review. *Journal of Engineering Education*. <https://doi.org/10.1002/jee.20588>
- [3] Helker, K., Bruns, M., Reymen, I. M., & Vermunt, J. D. (2024). A framework for capturing student learning in challenge-based learning. *Active Learning in Higher Education*, 14697874241230459. <https://doi.org/10.1177/14697874241230459>
- [4] Huesca, G., Rodríguez-Rosales, A., Lara-Prieto, V., Ruiz-Cantisani, M. I., & Acevedo, J. (2024). Effectiveness of Challenge-Based Learning in Undergraduate Engineering Programs from Competencies and Gender Perspectives. *Education Sciences*, 14(3), 255. <https://doi.org/10.3390/educsci14030255>
- [5] Khotimah, S., Bambang, B., & Setiarso, O. (2024). Factors That Influence Students' Entrepreneurial Competence: Efforts to Improve Project-Based Learning. *Proceeding ICMA-SURE*, 3(1), 358-364. <https://doi.org/10.20884/2.prodicma.2024.3.1.10385>
- [6] Ma, J. J. (2023). Development of education for sustainable fashion design using a challenge-based learning approach. *International Journal of Fashion Design, Technology and Education*, 16(2), 164-174. <https://doi.org/10.1080/17543266.2022.2137249>
- [7] Morselli, D., & Orzes, G. (2023). Evaluating an interfaculty entrepreneurship program based on challenge-based learning through the EntreComp framework. *The International Journal of Management Education*, 21(3), 100869. <https://doi.org/10.1016/j.ijme.2023.100869>
- [8] Ossa, L. A., Rost, M., Lorenzini, G., Shaw, D. M., & Elger, B. S. (2023). A smarter perspective: Learning with and from AI-cases. *Artificial Intelligence in Medicine*, 135, 102458. <https://doi.org/10.1016/j.artmed.2022.102458>
- [9] Portuguese Castro, M., & Gomez Zermeno, M. G. (2020). Challenge based learning: Innovative pedagogy for sustainability through e-learning in higher education. *Sustainability*, 12(10), 4063. <https://doi.org/10.3390/su12104063>
- [10] Romero Caballero, S., Canquiz Rincón, L., Rodríguez Toscano, A., Valencia Pérez, A., & Moreno Gómez, G. (2024). Challenge-based learning and design thinking in higher education: institutional strategies for linking experiential learning, innovation, and academic performance. *Innovations in Education and Teaching International*, 1-18. <https://doi.org/10.1080/14703297.2024.2326191>

- [11] Van Den Beemt, A., Vázquez-Villegas, P., Gómez Puente, S., O’Riordan, F., Gormley, C., Chiang, F. K., ... & Membrillo-Hernández, J. (2023). Taking the challenge: An exploratory study of the challenge-based learning context in higher education institutions across three different continents. *Education Sciences*, 13(3), 234. <https://doi.org/10.3390/educsci13030234>

E. BOOKS AND BOOK CHAPTERS

- [1] Boud, D., & Feletti, G. (2013). *The challenge of problem-based learning*. Routledge.
- [2] Cooper, R., & Murphy, E. (2016). *Hacking project-based learning: 10 easy steps to PBL and inquiry in the classroom*, Hack Learning Series, Times 10 Publication.
- [3] Delisle, R. (1997). *How to Use Problem-based Learning in the Classroom*. Amerika Birleşik Devletleri: ASCD.
- [4] Fisher, M. (2013). *Digital Learning Strategies: How Do I Assign and Assess 21st Century Work?* ASCD.
- [5] Graves, C., Graves, A., & Rendina, D. L. (2017). *Challenge-based learning in the school library makerspace*. Bloomsbury Publishing USA.
- [6] Henderson, R. (Ed.). (2016). *Problem-based learning: Perspectives, methods, and challenges*. Nova Science Publisher’s, Incorporated.
- [7] Juliani, A. J. (2014). *Inquiry and innovation in the classroom: Using 20% time, genius hour, and PBL to drive student success*. Routledge.
- [8] Larmer, J., Mergendoller, J., & Boss, S. (2015). *Setting the standard for project-based learning*. Ascd.
- [9] Lenz, B., Wells, J., & Kingston, S. (2015). *Transforming schools using project-based learning, performance assessment, and common core standards*. John Wiley & Sons.
- [10] Maxwell, M., Stobaugh, R., & Tassell, J. L. (2015). *RealWorld Learning Framework for Secondary Schools: Digital Tools and Practical Strategies for Successful Implementation*. Solution Tree Press.
- [11] Molina, A. (2023). *Challenge-Based Learning, Research, and Innovation: Leveraging Industry, Government, and Society*. Springer Nature.
- [12] Pinto Tortosa, A. J., Soto Pineda, J. A. (2021). *Challenge-Based Learning: un puente metodológico entre la Educación Superior y el mundo profesional*. Spain: ARANZADI/CIVITAS.
- [13] Spencer, J., & Juliani, A. J. (2017). *Empower: What happens when students own their learning* (p. 266). San Diego, CA: IMPress.
- [14] Bledsoe, C., & Pilgrim, J. (2015). *Challenge-based learning using iPad technology in the middle school*. In *Tablets in K-12 education: integrated experiences and implications* (pp. 238-261). IGI Global.

- [15] Gibson, D., Irving, L., & Scott, K. (2018). Technology-enabled challenge-based learning in a global context. Collaborative learning in a global world, 25-40.
- [16] Gallagher, S. E., & Savage, T. (2023). Challenge-based learning in higher education: an exploratory literature review. Teaching in Higher Education, 28(6), 1135-1157.
- [17] Recke, M. P., & Perna, S. (2021, February). An Emergent Narrative System to Design Conducive Educational Experiences. In Universities and Entrepreneurship: Meeting the Educational and Social Challenges (Vol. 11, pp. 185-198). Emerald Publishing Limited.
- [18] Halberstadt, J., Alcorta de Bronstein, A., Greyling, J., & Bissett, S. (2023). Transforming Entrepreneurship Education: Interdisciplinary Insights on Innovative Methods and Formats (p. 217). Springer Nature.



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