

INPLASY

Protocol for Systematic Review: Revisiting Challenge-Based Learning - Teaching Practices in Higher Education

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 31 May 2024 and was last updated on 31 May 2024.

INTRODUCTION

Review question / Objective The main question that the study seeks to address is as follows: RQ: Which teaching practices associated with Challenge-Based Learning (CBL) are most frequently identified in scientific and peer-reviewed publications in the context of higher education?. In addition to the primary research question, the study seeks to address the following objectives: To identify and categorize the various teaching practices used in the implementation of CBL in higher education.

The PICO criteria help frame the research question and identify relevant studies for inclusion in the study. It outlines:

- Population: Higher education students and educators involved in Challenge-Based Learning.
- Intervention/Exposure: Implementation of Challenge-Based Learning teaching practices.

- Comparison: Comparison with traditional teaching methods or other innovative pedagogical approaches.
- Outcomes: Identification of CBL teaching practices and improvement in student engagement and entrepreneurial skills.

Rationale This review will follow PRISMA 2020 guidelines (Page et al., 2021) to ensure a comprehensive and unbiased analysis. It will begin by formulating a detailed protocol specifying the scope and research question (Newman and Gough, 2020). A systematic search of multiple databases will be performed to gather an exhaustive list of potential articles. The methods section will outline the eligibility criteria, information sources, and search strategy used to identify and evaluate literature on Challenge-Based Learning (CBL) teaching practices in higher education.

Condition being studied This study focuses on the field of pedagogy, specifically innovative didactic and methodological approaches. It examines teaching practices associated with Challenge-Based Learning (CBL) in higher education. The aim is to identify and categorize effective CBL teaching methods that enhance student engagement, critical thinking, and problem-solving skills. By exploring these innovative educational strategies, the study seeks to contribute to the advancement of pedagogical practices and improve learning outcomes in higher education.

METHODS

Search strategy For the WoS database search, the options will be configured to specifically search within the Web of Science Core Collection in the “All Fields” edition. The “All Fields” edition will be employed in the search because it allows for exploration across all search fields using a single query. This will facilitate the identification of search terms in various fields. Additionally, the asterisk (*) character will be utilized within the term “teacher,” enabling the substitution of any number of characters, both before and after the keyword. The rationale for utilizing the “All Fields” edition and the asterisk (*) will be to maximize the comprehensiveness of the search, ensuring that potential relevant literature is not overlooked by examining multiple fields and accommodating variations in terminology or phrasing related to “teacher.” The search query in WoS will be ALL=(teacher* in challenge-based learning). The refining filters will include only open-access documents and articles.

In the case of the search in Scopus, the search will be conducted by selecting the option to search within “Article title, Abstract, Keywords,” and the search query used will be “teacher* AND in AND challenge-based AND learning.” Furthermore, the search will be constrained to articles restricted to the English language and refined to include only documents categorized as “All open access.”

Additionally, the timeframe for the search will be set with the start date chosen based on the first article published on the topic that meets the inclusion criteria mentioned in the previous sections. The end date will be the day the search is conducted.

Participant or population The criteria for including studies in this review are defined as follows: Types of Participants: Studies must focus on higher education students and educators engaged in Challenge-Based Learning (CBL).

Intervention - Interventions: The primary intervention of interest is the implementation of CBL teaching practices.

Comparator - Comparators: Studies may compare CBL teaching practices with traditional teaching methods or other innovative pedagogical approaches.

Study designs to be included - Study Designs: Only open access and peer-reviewed journal articles, full-text studies, and empirical research studies will be included. Reviews, editorials, opinion pieces, and non-peer-reviewed articles will be excluded.

Eligibility criteria Only open access and peer-reviewed journal articles, full-text studies, and empirical research studies will be included. Reviews, editorials, opinion pieces, and non-peer-reviewed articles will be excluded.

Information sources The primary databases that will be searched for relevant studies include Scopus and Web of Science (WoS). Selecting appropriate databases, such as WoS and Scopus, is crucial for conducting a comprehensive literature review. These databases provide significant advantages for scholarly research. WoS offers extensive coverage of high-impact journals and meticulous indexing, making it an invaluable resource for accessing a wide range of academic disciplines. Scopus, on the other hand, features a vast collection of multidisciplinary content and robust search capabilities, including the ability to search within article titles, abstracts, and keywords. Both databases enable researchers to access a wealth of peer-reviewed literature, ensuring a thorough and comprehensive review of the scholarly landscape. Using these databases allows researchers to conduct rigorous and credible literature reviews, enhancing the quality and reliability of their research results.

Main outcome(s) The findings of this systematic review are expected to have several significant implications for the field of higher education:

1. Enhanced teaching strategies: By providing a detailed list of effective CBL teaching practices, educators will have access to a valuable resource that can guide and improve their instructional methods. This can lead to more effective teaching and better student outcomes in higher education.
2. Informed decision-making: Educational institutions and policymakers can use these findings to make informed decisions about curriculum design and teaching approaches, promoting the adoption of CBL to foster critical

thinking, problem-solving skills, and student engagement.

3. Professional development: The identified teaching practices can serve as a foundation for professional development programs aimed at training educators in the effective implementation of CBL. This can enhance the overall quality of education provided by these institutions.

Additional outcome(s) 4. Increased collaboration: Sharing these results with educators at UCN and Universitat Autònoma de Barcelona will encourage collaboration and the exchange of best practices among institutions, leading to a broader implementation of CBL across different educational contexts.

5. Broader dissemination: Disseminating the findings through social media and academic conferences will raise awareness about the benefits and effective practices of CBL, potentially influencing a wider audience of educators, researchers, and stakeholders in the field of education.

Overall, the results of systematic review are expected to contribute to the advancement of CBL in higher education by promoting innovative teaching practices that enhance student learning and engagement.

Data management All data will be stored in secure digital repositories, categorized by relevant criteria such as date, source, and content type. A shared folder will be created on OneDrive for all authors to access the same resources. This structured approach to organization will streamline access and retrieval, minimizing the risk of data loss or confusion.

Zotero will be used to store all papers, maintaining a comprehensive literature repository and facilitating searches within the full-text versions of the articles. Microsoft Excel will be used to construct the thematic matrix, organizing and structuring data from the final set of 20 papers for comprehensive review and analysis.

Quality assessment / Risk of bias analysis A comprehensive synthesis of the findings will be meticulously conducted to ensure the trustworthiness of the review. The results will be presented in a transparent, systematic, and replicable format, fully aligned with the PRISMA 2020 guidelines. This approach will provide a clear and thorough overview of the current state of research on teaching methods within the context of Challenge-Based Learning in higher education settings.

In line with the commitment to rigor and clarity, the study will utilize the Delphi Method with Expert

Panels for a “Certainty Assessment” of CBL teaching practices, employing a confidence checklist by educators from the University College of Northern Denmark (UCN). This methodology will be designed to provide a robust and reliable evaluation of the findings, thereby enhancing the validity and completeness of the study.

The process will begin with the selection of an expert panel from the education sector, chosen for their significant expertise in CBL. The next step will outline the specific outcomes to be evaluated, focusing on the CBL teaching practices. In the third phase, the experts will independently assess the certainty of the evidence for each teaching practice, allowing for impartial evaluations. Following this, responses will be compiled and synthesized to create a unified summary of the panel’s assessments, ensuring a broad overview of their collective certainty regarding CBL teaching practices.

The final step will address any disagreements within the expert panel, aiming to reach a consensus on the certainty ratings and ensure that the assessments accurately represent a cohesive expert view. This streamlined approach will effectively consolidate expert insight into the efficacy of CBL teaching practices.

Strategy of data synthesis In addition to storage and management, emphasis will be placed on data analysis methodologies. A thematic analysis (Sundler et al., 2019; Braun and Clarke, 2022) will be conducted on the remaining records. This analysis will follow a structured approach using a thematic matrix that initially incorporates predefined themes (e.g., CBL definition and research methodology) and subsequently integrates the emerging themes identified during the analysis process. These emergent themes will be recognized as pertinent to the goal of comprehending research on teaching practices in CBL (e.g., instructors and assessment). Through this systematic analysis, trends, correlations, and anomalies will be identified, contributing to informed decision-making and comprehensive review outcomes.

Subgroup analysis Not applicable for this study.

Sensitivity analysis Not applicable for this study.

Language restriction Yes, only studies published in English will be included in the search.

Country(ies) involved Spain and Denmark.

Other relevant information The protocol has been prepared by Marisol Galdames Calderón (Author 1)

Universitat Autònoma de Barcelona, Spain. However, the systematic review is anticipated to be conducted with the collaboration of two additional authors, Anni Stavnskær Pedersen (Author 2) from University College of Northern Denmark (UCN) and David Rodríguez Gómez (Author 3) from Universitat Autònoma de Barcelona, Spain.

Keywords Systematic literature review, Challenge-Based Learning (CBL), teaching practices, and Higher Education.

Dissemination plans The results of this systematic review will be presented in the format of a scientific article and published in a peer-reviewed academic journal. Additionally, the findings will include communication and dissemination strategies, such as participation in academic conferences. The results will also be presented to the faculty members at the University College of Northern Denmark (UCN) who implement Challenge-Based Learning (CBL) and participated as experts. They will have the opportunity to review the documented practices they evaluated.

Furthermore, the findings will be shared with educators involved in higher education teaching at the participating universities: Universitat Autònoma de Barcelona and UCN. These presentations will aim to inform and engage these educators about the effective teaching practices in CBL identified through this review.

To maximize outreach, the results will be disseminated on social media platforms such as Instagram, X (formerly Twitter), LinkedIn, and through the Faculty of Education's newsletter. This approach aims to reach a wide audience interested in CBL teaching practices, ensuring that the findings are accessible to as many stakeholders as possible.

Contributions of each author

Author 1 - Marisol Galdames Calderón - The creation of the protocol has been entirely prepared by Author 1 (Marisol Galdames Calderón), who undertook the following tasks: preparation of the protocol in all its phases, database investigation, and payment of the registration fee.

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