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The impact of virtual reality on employee training and learning: A systematic literature review

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ADMINISTRATIVE INFORMATION

Support - Not applicable.

Review Stage at time of this submission - Completed but not published.

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 27 August 2025 and was last updated on 27 August 2025.

INTRODUCTION

Review question / Objective The research question is How has virtual reality changed the perception of training and development among professionals in different organizations?
Our literature review aims to: 1) Investigate recent transformations in the field of training and human resource development; 2) Identify the opportunities and challenges that virtual reality presents for professional training and skills development; 3) Analyse the competencies acquired through virtual reality-based training; 4) Explore the role of virtual reality in organizational strategy and its integration into human development processes.

Rationale Virtual reality has been reshaping training delivery, with conventional methods being progressively supplemented by VR-based training. Accordingly, it is crucial to assess the impact of virtual reality on workforce training and competence development through a thorough and comprehensive systematic review of the literature.

Condition being studied Not applicable.

METHODS

Search strategy A search of the SCOPUS (All fields) database is as follows:

"Virtual Reality" AND "Learning" AND "Training" AND "organizations"

A search of the WoS Core Collection (All fields) database is as follows:

"Virtual Reality" AND "Learning" AND "Training" AND “organizations".

Participant or population Professionals of different fields.

Intervention Not applicable.

Comparator Not applicable.

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Study designs to be included (1) Peer-reviewed scientific articles;(2) Conference articles;(3) Original studies (quantitative, qualitative, or mixed methods), systematic reviews, and meta-analyses. (4) Research on training, learning and virtual reality; (5) Studies published in English, with no time restrictions.

Eligibility criteria Three researchers defined the criteria of inclusion/exclusion.

Studies included:

(1) Peer-reviewed scientific articles;
(2) Conference articles;
(3) Original studies (quantitative, qualitative, or mixed methods), systematic reviews, and meta-analyses.
(4) Research on training, learning and virtual reality;
(5) Studies published in English, with no time restrictions.

Excluded studies:

(1) Letters, meeting abstracts, theses, media reports, content feeds;
(2) Articles that do not focus on virtual reality and training and learning;
(3) Essays or opinions without empirical data or in-depth analyses;
(4) Books.

Information sources Databases: SCOPUS, Web of Science (WoS)

These databases were selected for their complementary coverage and robust relevance to the topic. SCOPUS and Web of Science ensure interdisciplinary and comprehensive coverage of organizational and social literature.

Main outcome(s) To identify, synthesize, and analyse evidence of the opportunities and challenges of virtual reality in organizational training and development.

Additional outcome(s) Not applicable.

Data management Titles and abstracts are screening, the full article will be read to make a decision regarding the inclusion of the article. If there is a disagreement between the two reviewers, a third reviewer makes the final decision. This process should be iterative to ensure all relevant studies will be included. A pilot test will be implemented to ensure consistency among reviewers. Search results and the study selection process will be reported in the final review and presented in the PRISMA 2020 Flow Diagram. After the entire process, all data are recorded and exported in the form of Excel.
The articles retrieved from the database search were imported and compiled into an Excel database.

Quality assessment / Risk of bias analysis 1- Removal of Duplicated Literature
After retrieving results from the selected databases, an initial step will be undertaken to exclude duplicate studies.
2- Screening Steps
The selection process will follow three sequential steps:
• (1) Abstract Screening: Abstracts of selected articles will be analysed to verify their relevance concerning the inclusion and exclusion criteria.
• (2) Full-Text Screening: Full texts of articles that pass the abstract screening will be assessed according to the established eligibility criteria. Only studies meeting all the criteria will be included in the review.
3- Reviewer Agreement
The screening process will be conducted by two independent reviewers. Screening will begin only after achieving at least 75% agreement between the reviewers in a pilot test applied to a sample of articles to ensure consistency in applying the criteria.
4- Reporting Research Results
The results of the selection process will be presented in a PRISMA 2020 Flow Diagram. This flowchart will detail the screening stages, from the initial number of identified studies to the final articles included in the literature review, with justification provided for exclusions at each stage.
5- Data Registry and Export
All information regarding selected articles, rejected articles, and reasons for exclusion will be recorded in an Excel file. This registry will be used for analysis and as documentation for auditing the review process.

Strategy of data synthesis Tables and Figures will present the extracted data for each extraction category, followed by a detailed qualitative descriptive analysis.

Subgroup analysis Not applicable.

Sensitivity analysis Use of PRISMA 2020 Checklist.

Language restriction English.

Country(ies) involved Portugal.

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Other relevant information Not applicable

Keywords Virtual Reality; Learning; Training; Organizations; Employees.

Dissemination plans Publication in peer-reviewed journals and conferences.

Contributions of each author

Author 1 - Sofia Carvalho - Co-first author of the protocol who drafted the protocol and led and provided feedback for the screenings and development of the research question, research strategy, eligibility criteria, risk of bias assessment strategy, and data extraction and analysis, will draft the manuscript.
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Author 2 - Ema Conceição - Co-first author of the protocol who led the refinement and modification of the search strategy, eligibility criteria and draft protocol, led and conducted pilot testing and formal screening of the search results against the eligibility criteria, will draft the manuscript.
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Author 3 - Isabel Marques - Co-first author of the protocol who drafted the protocol and provided feedback for screening and developing the research question, search strategy, eligibility criteria, data extraction and presentation plans, will draft the manuscript.
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