

PRISMA 2020 Checklist

Systematic Review

Manuscript title:

Gamification as an Information Technology Tool for Enhancing Cognitive Skills and Critical Thinking: A Systematic Review

TITLE

Item	PRISMA checklist item	Location reported
1	Identify the report as a systematic review	Title

ABSTRACT

Item	PRISMA checklist item	Location reported
2	Structured summary of objectives, methods, results, and conclusions	Abstract

INTRODUCTION

Item	PRISMA checklist item	Location reported
3	Rationale for the review in context of existing knowledge	Section 2 (Literature Review)
4	Explicit statement of objectives / research questions	Section 3 (Research Objectives)

METHODS

Eligibility criteria

Item	PRISMA checklist item	Location reported
5	Inclusion and exclusion criteria	Section 5.5; Table 2

Information sources

Item	PRISMA checklist item	Location reported
6	Databases and information sources	Section 5.2

Search strategy

Item	PRISMA checklist item	Location reported
7	Full search strategy	Section 5.3; GitHub repository

Selection process

Item	PRISMA checklist item	Location reported
8	Study selection and screening process	Section 5.4; Fig. 2

Data collection process

Item	PRISMA checklist item	Location reported
9	Data extraction process	Section 5.6

Data items

Item	PRISMA checklist item	Location reported
10a	Outcomes and variables extracted	Sections 2.3–2.6
10b	Other variables (context, technology, design)	Sections 5.6, 6

Risk of bias assessment

Item	PRISMA checklist item	Location reported
11	Assessment of methodological limitations	Section 2.5

Effect measures

Item	PRISMA checklist item	Location reported
12	Effect measures	Not applicable (qualitative synthesis and bibliometric analysis)

Synthesis methods

Item	PRISMA checklist item	Location reported
13a	Synthesis approach	Sections 5.6, 6
13b	Data preparation methods	Section 5.6
13c	Methods for tabulation and visualization	Figures 3–7; Table 3
13d	Exploration of heterogeneity	Sections 6.1–6.4
13e	Sensitivity analysis	Not applicable

Reporting bias assessment

Item	PRISMA checklist item	Location reported
14	Reporting bias considerations	Section 2.5; Section 7

Certainty assessment

Item	PRISMA checklist item	Location reported
15	Certainty and strength of evidence	Section 6.5

RESULTS

Study selection

Item	PRISMA checklist item	Location reported
16a	Search and selection results	Section 5.4; Fig. 2
16b	Excluded studies and reasons	Section 5.4

Study characteristics

Item	PRISMA checklist item	Location reported
17	Characteristics of included studies	Table 3; GitHub dataset

Risk of bias in studies

Item	PRISMA checklist item	Location reported
18	Risk of bias within studies	Section 2.5

Results of individual studies

Item	PRISMA checklist item	Location reported
19	Results of included studies	Sections 2.3–2.6

Results of syntheses

Item	PRISMA checklist item	Location reported
20a	Summary of findings	Section 6
20b	Statistical synthesis	Not applicable
20c	Heterogeneity	Sections 6.1–6.4

Item	PRISMA checklist item	Location reported
20d	Sensitivity analysis	Not applicable

Reporting biases

Item	PRISMA checklist item	Location reported
21	Reporting bias	Section 7

Certainty of evidence

Item	PRISMA checklist item	Location reported
22	Certainty of evidence	Section 6.5

DISCUSSION

Item	PRISMA checklist item	Location reported
23a	Interpretation of results	Section 6
23b	Limitations of evidence	Section 7
23c	Limitations of review process	Section 7
23d	Implications for practice and research	Sections 6.5, 7

OTHER INFORMATION

Item	PRISMA checklist item	Location reported
24a	Registration	Not registered
24b	Protocol	Not applicable
24c	Amendments	Not applicable
25	Funding	Section 8 (Acknowledgements)
26	Competing interests	Not declared
27	Data availability	Section 5.7; GitHub repository