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Complex world into complex classrooms: fostering systems thinking in education

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ADMINISTRATIVE INFORMATION

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 August 2024 and was last updated on 07 August 2024.

INTRODUCTION

Review question / Objective 1) What is the status of the development of systems thinking in complexity, including trends in the number of publications, what are the geographic characteristics and the level of education?

2) What are the interactions that integrate cooperation learning, systems thinking and multicultural paradigms?

3) Is systems thinking addressing complexity in education?

Condition being studied 1. Library resources and reviewers at Korea University. 2. Specific research objectives and research methods have been established.

METHODS

Search strategy TS = (("complex") and ("systems thinking") and ("educational")).

Participant or population Students.

Intervention No.

Comparator No.

Study designs to be included Experimental.

Eligibility criteria

Inclusion

a. All studies related to "cooperative learning, sustainable development, complex systems, cultural diversity"

b. Search period from early 1992 to 1 June 2024

c. Peer review

d. Experimental type of research

e. University students, secondary school students, primary school students, children

Exclusion

a. Conference papers and book chapters are not included

b. Languages in English.

Information sources Web of Science (WOS) and Scopus.

Main outcome(s) Based on the purpose of the study, and after discussion among the authors and comparison of previous studies, the final search strategy chosen was TS = (“complex”) and (“systems thinking”) and (“educational”). Through the search, we found 764 and 290 documents in Scopus and WOS, respectively, based on the Korea University library repository search time set to 1992-2024.07.01. A total of 1,054 documents were entered using Endnote 20. 918 documents remained after removing duplicates by removing 136, and 915 after removing 3 withdrawn manuscripts. Final Scopus papers (752) and WOS papers were scrutinized (163). To look for possible interventions and to improve the quality of the literature we selected research literature that is mainly experimental in nature, the specific screening process is shown in the Figure 2.

Quality assessment / Risk of bias analysis Inclusion/exclusion criteria for each study were then independently confirmed by the first and second authors. The intercoder agreement rate was 95.8%. Disagreements between the two coders were resolved by further discussion with the corresponding author and review of controversial studies. A total of 120 studies met the inclusion criteria and were used in the analysis.

Strategy of data synthesis Ten features related to the quality of study research methodology were coded including (a) research purpose, (b) learner demographic (e.g., elementary, secondary, tertiary), (c) method (e.g., survey, experiment, etc.), (d) discipline-orientation (e.g., humanities, social sciences, natural sciences, formal sciences, applied sciences and professional studies), (e) courses, (f) educational contexts (i.e., formal learning, non-formal learning and informal learning), (g) learning outcome (cognitive). During data analysis, low-quality studies were excluded from the synthesis. In the current analysis, a quantitative study was considered low quality and excluded if it did not depict its methodological design features such as sample size and procedure. Qualitative studies were excluded if they failed to provide a rich description such as learning outcomes or appeared to rely more on the author’s experience rather than field observations.

Subgroup analysis No.

Sensitivity analysis No.

Language restriction English.

Country(ies) involved Republic of Korea; Spain.

Keywords Complex, Systems Thinking (ST), Cooperation Learning, Sustainable Multicultural Development, Systematic Review, Complex Classrooms.

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