The role of philosophical inquiry in cultivating critical thinking among students: A scoping review

Mohammed Looti
University of Kerbala
mohammed.jawad@uokerbala.edu.iq

Marwa Abd-Alzim
University of Kerbala
maroa.abd@uokerbala.edu.iq

Abstract

Background: Critical thinking is increasingly acknowledged as an essential skill for students in the 21st century. Consequently, pedagogical approaches that foster critical thinking are of considerable scholarly interest. Philosophical inquiry, particularly outside the domain of religious education, has been identified as a potential method for cultivating these skills.

Objective: This scoping review systematically maps the extant literature concerning the application of philosophical methods and interventions to foster critical thinking skills in students, specifically excluding implementations within religious education. The review investigates the types of interventions employed, the populations studied, the outcomes assessed, and the reported efficacy of these approaches.

Methods: A systematic literature search was conducted using the Scopus and Web of Science databases, encompassing publications from January 1 2014, to December 31 2024. Inclusion criteria stated that studies examine the use of philosophical methods (e.g. Socratic questioning, communities of inquiry, Philosophy for Children) to enhance critical thinking in students at any educational level, outside of religious instruction. Extracted data included study characteristics, participant demographics, intervention specifics, outcome measures, and principal findings. A narrative synthesis was conducted.

Results: Thirty-three studies satisfied the inclusion criteria. These studies represented a broad spectrum of educational levels, from preschool through to higher education, and diverse geographical regions across Asia, Europe, North America, and Africa. Interventions varied in duration and specific philosophical approach but frequently involved methodologies such as Philosophy for Children (P4C), Socratic methods, and facilitated community of inquiry discussions, often integrated into various curricula. The majority of studies reported positive impacts on various facets of critical thinking, including reasoning abilities, argumentation, communication, and metacognitive

awareness, alongside notable effects on non-cognitive skills and evidence of skill transfer across different contexts.

Conclusion: The accumulated evidence indicates that philosophical inquiry can be a valuable pedagogical tool for cultivating critical thinking skills in students across a variety of educational settings and age cohorts. Further investigation is warranted to refine intervention designs, ascertain long-term effects, explore optimal implementation conditions, and further investigate mechanisms of skill transfer.

Key words

argumentation, critical thinking, community of inquiry, education, metacognition, Philosophy for Children (P4C), pedagogy, philosophical inquiry, reasoning, Socratic method

Introduction

Critical thinking is pervasively recognised as an indispensable skill for navigating the multifaceted complexities of the 21st-century world (Alzahrani & Almutairi 2023; Dwyer 2017; Facione 2011; Li et al. 2024). It encompasses a constellation of cognitive abilities, including the capacity to analyse information discerningly, rigorously evaluate arguments, identify underlying biases and assumptions and construct well-reasoned judgements substantiated by evidence (Ennis 2018; Kadrija et al. 2023). The cultivation of robust critical thinking skills is not merely crucial for academic achievement; it is vital for attaining professional competence, making informed decisions in one's personal life and engaging in responsible and efficacious civic participation (Ho et al. 2023b; Lai 2011; Rombout et al. 2024). The capacity to think critically empowers individuals to differentiate between credible and unreliable sources of information to resist manipulation and propaganda and to contribute constructively to societal discourse.

Traditional educational paradigms frequently characterised by teacher-centered instruction rote memorisation and passive knowledge acquisition, have been increasingly critiqued for their inadequacy in fostering genuine critical thinking (Hussien et al. 2021; Paul & Elder 2006). Such pedagogical approaches often prioritise the transmission of factual content over the development of higher-order thinking skills, leaving students ill-equipped to contend with the ambiguous, ill-defined problems that characterise real-world challenges (Sternberg 2003). In stark contrast student-centred pedagogical approaches that emphasise active learning, inquiry-based investigations and dialogic interaction have consistently demonstrated greater promise in cultivating critical thinking abilities (Abrami et al. 2015; Li et al. 2024).

These approaches position the student at the centre of the learning process encouraging them to actively construct their own understandings, challenge extant knowledge claims and engage in collaborative problem-solving.

Among the diverse array of student-centred approaches philosophical inquiry has emerged as a particularly potent and efficacious method for stimulating and nurturing critical thinking (Golding 2011; Green & Condy 2016). Philosophy at its core is fundamentally concerned with exploring profound and enduring questions about the nature of knowledge, reality, values and the principles of sound reasoning (Jirásek & Gerova 2024; Lipman 2003). Philosophical inquiry therefore inherently involves engaging in reasoned dialogue, strictly scrutinizing diverse perspectives, rigorously evaluating arguments and striving for conceptual clarity (Breivik 2020; Daniel & Auriac 2011). This very process provides an exceptionally well-structured environment for students to practice, refine and internalise critical thinking skills.

The explicit and sustained focus on reasoning justification, and conceptual precision that characterises philosophical discourse offers a robust framework for developing critical thinking (Zappalà & Smyth 2021). Students engaged in philosophical inquiry are consistently challenged to articulate their own perspectives clearly to develop compelling justifications for their beliefs to anticipate and address counterarguments and to identify and evaluate the underlying assumptions of divergent positions (Nussbaum 1997). This continuous intellectual exercise cultivates a habit of mind that is both rigorous and open-minded which is indispensable for navigating the complexities of a rapidly evolving world.

One particularly influential and widely adopted approach to philosophical inquiry in educational settings is Philosophy for Children (P4C), originally conceived by Matthew Lipman (Alzahrani & Almutairi 2023; Lipman, Sharp & Oscanyan, 1980). P4C employs a distinctive 'community of inquiry' pedagogy, wherein students and teachers collaboratively engage in philosophical discussions guided by a facilitator who fosters respectful dialogue, critical questioning and the exploration of diverse perspectives (Green & Condy 2016; Zappalà & Smyth 2021). This approach is explicitly designed to cultivate not only critical thinking skills but also creative thinking, caring thinking (emphasising empathy and ethical considerations) and collaborative thinking (promoting effective communication and teamwork) (Green & Condy 2016). While P4C was initially envisioned for younger children its core principles and pedagogical methods have been successfully adapted and implemented with students of all ages and across a broad spectrum of educational contexts (Gregory 2007; Özcans et al. 2023).

Beyond the specific framework of P4C other established philosophical methods notably the Socratic method have been effectively utilised to enhance critical thinking across diverse disciplines (Ho et al. 2023b; Tredway 2004). The Socratic method named after the ancient Greek philosopher Socrates involves a series of carefully sequenced and strategically posed questions designed to expose underlying assumptions, challenge pre-existing beliefs and stimulate deeper more reflective thinking (Ho et al. 2023b). This technique when adeptly employed can be adapted to a wide range of educational contexts, prompting students to critically examine subject matter, analyse concepts and develop more nuanced and well-supported understandings.

The potential advantages of incorporating philosophical inquiry into education extend beyond the development of cognitive skills. Engaging in philosophical discussions can also foster students' moral development, enhance their communication skills and cultivate a greater sense of intellectual humility and open-mindedness (Haynes 2002). By grappling with complex ethical dilemmas and by considering divergent viewpoints, students develop a heightened capacity for empathy and ethical reasoning. The collaborative nature of philosophical inquiry also strengthens communication skills, as students learn to articulate their ideas clearly, listen attentively to others and respond respectfully to differing perspectives.

The imperative to cultivate critical thinking skills in students has never been more pronounced. In an era characterised by information overload, rapid technological advancements and complex global challenges, the ability to think critically, evaluate information and make sound judgements is essential for individual well-being and societal progress. This scoping review, therefore, seeks to systematically map the landscape of extant research concerning the utilisation of philosophical methods and interventions to foster critical thinking in students, specifically excluding applications in the context of religious education. This focused exclusion is deliberate, aiming to isolate and highlight the unique contributions of philosophical inquiry itself, disentangled from any specific religious content or doctrinal commitments.

By systematically examining the existing literature, this review aims to provide a comprehensive overview of the current state of the field, identify salient trends and patterns, highlight areas of consensus and divergence, and pinpoint promising avenues for future scholarly inquiry.

Methods

This scoping review adhered Strictly to the established methodological framework for scoping studies as originally articulated by Arksey and O'Malley (2005) incorporating

subsequent enhancements and refinements proposed by Levac, Colquhoun and O'Brien (2010) and drawing upon the Joanna Briggs Institute (JBI) guidance for scoping reviews (Peters et al. 2020, 2017). This framework provides a systematic, iterative and transparent process for mapping the breadth and depth of evidence within a clearly defined research area. Ethical approval was deemed unnecessary for this review as it involved the analysis of publicly available, published literature and did not involve any primary data collection from human participants.

The review process comprised the following five distinct, yet iterative, stages:

1. Identifying the research question

This foundational stage of identifying the research question involved the precise and unambiguous articulation of the overarching research question and a set of associated sub-questions. This ensured that the review remained tightly focused and that all subsequent methodological steps were directly and logically aligned with the review's aims. The primary research question guiding this scoping review was:

> *What is the role of philosophical methods and interventions in fostering critical thinking skills in students, outside of religious education?*

To address this broad question with greater specificity and to explore different facets of the issue, the following sub-questions were developed:

1. What specific types of philosophical interventions (e.g. Philosophy for Children (P4C), Socratic seminars, ethical dilemma discussions) have been employed to enhance critical thinking skills in students?
2. What student populations (in terms of age, educational level, and background characteristics) have been involved in these philosophical interventions?
3. What specific critical thinking skills (e.g. argumentation, analysis, evaluation, inference, interpretation) have been targeted and measured in the research?
4. What is the reported effectiveness of these philosophical interventions in improving students' critical thinking skills, as evidenced by the research findings?
5. What are the identified limitations of the existing research, and what are the implications for future research and pedagogical practice in this field?

2. Identifying relevant studies

Identifying relevant studies involved a comprehensive and systematic search of the relevant literature to identify studies that met the predefined eligibility criteria. A multi-faceted approach was employed to maximise the comprehensiveness of the search:

Database selection: Two prominent electronic bibliographic databases were selected based on their comprehensive coverage of the relevant fields of education, philosophy and related social sciences and their established reputation for indexing high-quality scholarly publications:

> Scopus: A multidisciplinary database encompassing a vast range of peer-reviewed journals, conference proceedings, and books, renowned for its broad international coverage.
>
> Web of Science: A comprehensive database with strong representation of high-impact journals across various disciplines recognised for its citation indexing capabilities.

Search strategy development: A highly sensitive search strategy was developed through an iterative process involving several rounds of pilot testing and refinement. This iterative approach was crucial for maximising the retrieval of relevant studies while minimising the inclusion of irrelevant material. The process involved:

> Keyword identification: Key terms and phrases were identified directly relating to the three core concepts underpinning the research question: philosophy, critical thinking and education. These initial terms were derived from the research question itself, the authors' existing subject-matter expertise and preliminary scans of the relevant literature.
>
> Synonym and related term generation: For each identified key concept a comprehensive range of synonyms, related terms, and variations (including the use of truncation to capture different word endings) were generated. This ensured that the search captured all relevant studies even if they used slightly different terminology.
>
> Boolean operator combination: Boolean operators (AND, OR) were used to strategically combine the identified keywords and phrases, creating a logically structured search string that accurately reflected the research question. Parentheses ensured the correct order of operations.
>
> Database-specific adaptation*:* The search string was Strictly adapted to the specific syntax and search functionality requirements of each database (Scopus

and Web of Science). This ensured that the search was optimised for each platform. The following is the final search string used in Scopus:

> TITLE-ABS-KEY ((philosoph* OR "Philosophy for Children" OR p4c OR "community of inquiry" OR "Socratic method" OR "philosophical inquiry" OR "philosophical dialogue") AND ("critical thinking" OR reasoning OR argumentation OR metacognition OR "higher order thinking" OR "analytical skill*") AND (student* OR pupil* OR learner* OR education* OR school* OR "higher education" OR universit* OR college* OR classroom*)) AND NOT TITLE-ABS-KEY (("religious education" OR "islamic education" OR "christian education" OR "jewish education" OR "buddhist education" OR "hindu education" OR theology OR divinity OR spiritual* OR faith-based)) AND PUBYEAR > 2014 AND PUBYEAR < 2024 AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))

A functionally equivalent search string tailored to the specific syntax of Web of Science, was developed and implemented.

Pilot testing and refinement: The search strategy underwent multiple rounds of pilot testing within each database. The results of each pilot search were carefully reviewed to assess the relevance of the retrieved records. The search string was iteratively refined by adding, removing, or modifying keywords and by adjusting the combination of Boolean operators to achieve an optimal balance between sensitivity (the ability to retrieve all relevant studies) and specificity (the ability to exclude irrelevant studies).

Date limits: The search was confined to studies published between 1 January 2014 and 31 December 2024. This 10-year timeframe was chosen to capture contemporary research and pedagogical practices, while also providing a sufficient body of literature for a comprehensive scoping review.

Language restriction: Only studies published in English were included. This decision was made due to practical constraints related to language expertise and available resources for translation. This limitation is acknowledged in the discussion section.

3. Study selection

Study selection involved a rigorous and transparent two-phase screening process to select studies that met the predefined inclusion and exclusion criteria. The process was designed to minimise bias and ensure consistency. There were two phases:

Phase 1: Title and abstract screening: Two independent reviewers (Dr. Looti and Dr. Abd Alazim) screened the titles and abstracts of all records retrieved from the database searches. Each reviewer independently applied the eligibility criteria (detailed below) to determine whether each record was potentially relevant. Records were categorised as 'include', 'exclude', or 'uncertain'. Discrepancies or uncertainties were resolved through discussion and consensus.

Phase 2: Full-text review: The full text of all records categorised as 'include' or 'uncertain' in Phase 1 were obtained. The same two independent reviewers assessed the full texts against the eligibility criteria, making a final determination on inclusion or exclusion. Reasons for exclusion were carefully documented. Disagreements were, again, resolved through discussion and consensus.

Eligibility criteria: The following pre-defined, explicit criteria were applied consistently:

- Population: Studies can focus on students of any age or educational level, including primary school, secondary school and higher education (undergraduate and postgraduate). Studies focusing exclusively on educators, teachers, administrators, or other non-student populations were excluded.
- Concept: Studies must investigate interventions that explicitly employed philosophical methods or approaches with the primary and stated aim of fostering critical thinking skills. This included but was not limited to: Philosophy for Children (P4C), community of inquiry pedagogy, Socratic questioning or Socratic seminars, philosophical dialogue or structured discussion-based approaches and ethical dilemma discussions explicitly grounded in philosophical concepts. Studies that only made a tangential mention of philosophy or did not clearly articulate a specific philosophical methodology were excluded.
- Context: Studies must be conducted in an educational setting, broadly defined. This included formal educational institutions (e.g. schools, universities, colleges) and other settings where structured learning activities took place. However, studies exclusively focusing on religious education were excluded. This exclusion criterion was implemented to isolate the effects of philosophical inquiry itself, independent of any specific religious content or doctrine.
- Study types: All empirical study designs were eligible for inclusion: quantitative (e.g. randomised controlled trials, quasi-experimental studies, pre-post designs), qualitative (e.g. ethnographic studies, phenomenological studies). Reviews,

theoretical papers, opinion pieces, editorials, and conference abstracts (without full-text publications) were excluded. Only peer-reviewed studies reporting original empirical data were considered.

4. Charting the data

Charting the data involved the systematic and consistent extraction of relevant data from each included study, using a standardised data charting form. The form was developed a priori and piloted on a small sample of studies to ensure clarity, comprehensiveness and ease of use:

Data extraction form: The following data elements were extracted:

- Study characteristics: Author(s), year of publication, country, study design (e.g. randomised controlled trial, quasi-experimental study, case study).
- Participant information: Sample size (total number of student participants), age or grade level, educational setting (e.g. primary school, secondary school, university), and relevant demographic characteristics (e.g. gender, socioeconomic status, prior academic achievement) if reported.
- Intervention details: Type of philosophical intervention (e.g. P4C, Socratic seminar, community of inquiry), duration (e.g. number of weeks, months), frequency of sessions (e.g. once a week, twice a week), detailed description of activities (e.g. topics discussed, materials used, specific pedagogical techniques), and facilitator training or qualifications (if reported).
- Key findings: Main results related to the impact of the intervention on critical thinking, statistically significant differences reported (e.g. intervention vs. control group), qualitative findings related to changes in thinking, reasoning, or communication, and reported adverse effects or unintended consequences.

Data extraction process: Two independent reviewers (Dr. Looti and Dr. Abd Alazim) extracted data. Extracted data were compared, and discrepancies were resolved through discussion and consensus.

5. Collating, summarising and reporting the results

The final stage of collating, summarising and reporting the results involved synthesising and summarising the extracted data to provide a comprehensive overview of the existing literature and to directly address the research questions. A narrative synthesis approach was employed:

Data organisation: Extracted data were organised and systematically tabulated according to key themes, types of philosophical interventions, student populations, outcome measures, reported effectiveness, and identified limitations.

Descriptive summary: A descriptive summary of the characteristics of the included studies was generated, providing an overview of study designs, sample sizes, geographical locations, and participant demographics.

Thematic analysis: Findings were analysed to identify common themes, recurring patterns, areas of convergence and divergence, and conflicting evidence.

Narrative synthesis: A narrative account of the findings was developed synthesising the evidence in direct relation to the research questions. This narrative highlighted key findings, discussed implications for practice and future research, and identified gaps in the literature.

Table creation: A summary table (Table 1) presents key characteristics and findings of each included study.

Consideration of methodological quality

Consistent with scoping review methodology a formal, in-depth critical appraisal of the methodological quality of individual studies using standardised tools was *not* conducted. Scoping reviews aim to map the literature, not to assess risk of bias. However, study design was recorded providing some indication of methodological rigour. Limitations associated with different study designs are acknowledged in the Discussion.

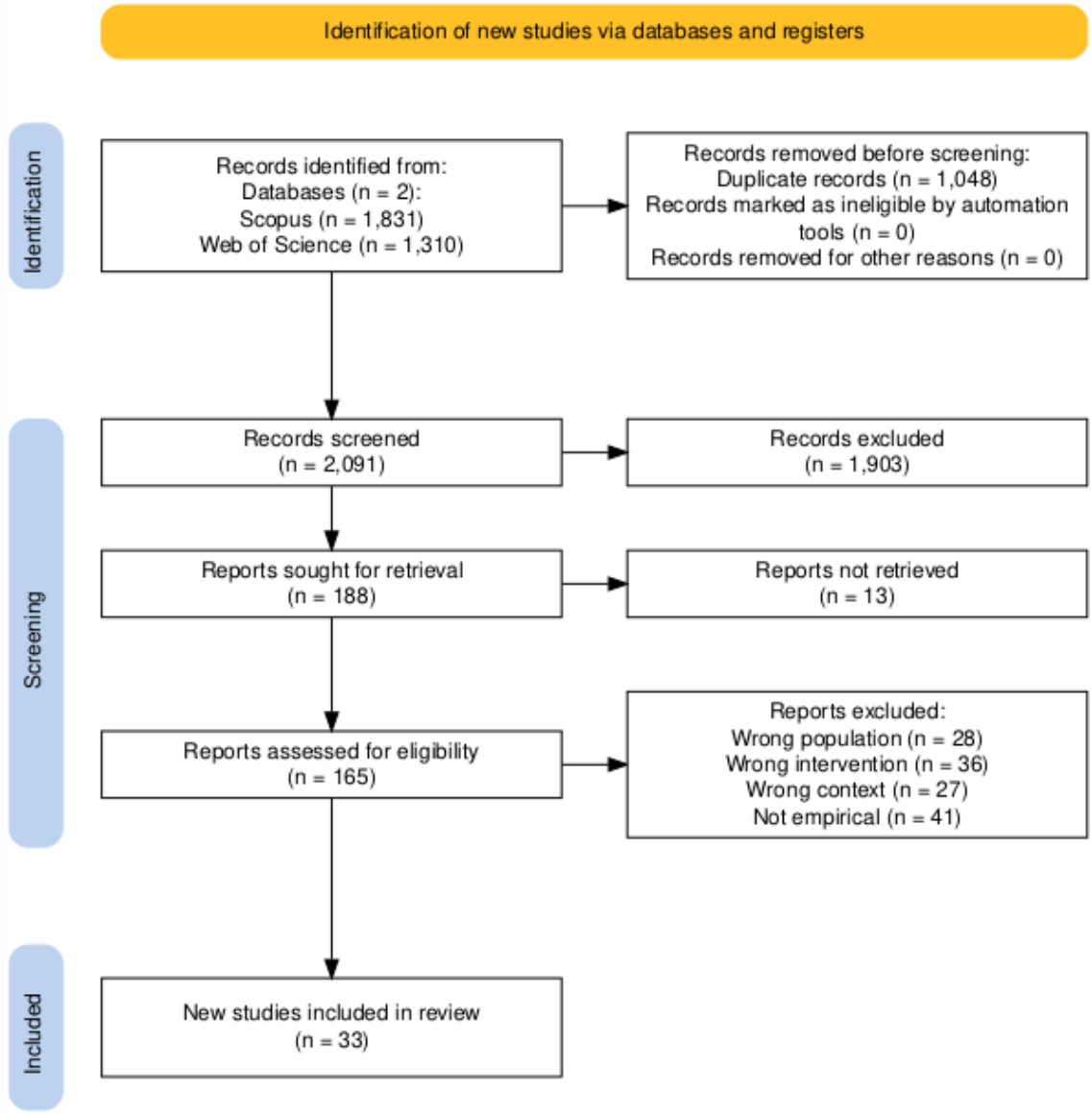
Results

This scoping review systematically examined the literature concerning the role of philosophical methods and interventions in fostering critical thinking skills in students outside of religious education. The search conducted on 1 May 2025, across Scopus and Web of Science yielded a substantial number of initial records. Following a rigorous two-stage screening process (title/abstract and full-text review) 33 studies met the pre-defined eligibility criteria and were included in the final analysis.

Study selection

The initial search and subsequent screening procedures are delineated in the PRISMA diagram (Figure 1) which was generated using the PRISMA2020 tool (Haddaway et al. 2022).

Figure 1: PRISMA flow diagram



Study characteristics

The 33 studies included in this review published between 2014 and 2024, represent a diverse range of geographical locations and educational settings. The studies were conducted in:

- **Asia (15 studies):** China (Shi 2024), investigations involving EFL learners (Li et al. 2024), Hong Kong (Lam 2021, 2019), Indonesia (Birsyada et al. 2024), Iran (KarimiRad et al. 2022; Rahdar et al. 2018), Japan (Takada et al. 2022), Malaysia (Dalim et al. 2022; Zulkifli & Hashim 2020; Hashim et al. 2014), Saudi Arabia (Alzahrani & Almutairi 2023), Taiwan (Ho et al. 2023a; 2023b), and Thailand (Boa et al. 2018).

- **Europe (14 studies):** England (Siddiqui et al. 2017; Gorard et al. 2017), Estonia (Säre et al. 2016), France (Archila 2015), Netherlands (Rombout et al. 2024, 2022), Portugal (Morais et al. 2017), Russia (Gulevataya et al. 2023), Scotland (Topping & Trickey 2014), Spain (Seuba & Castelló 2015; Fernández-Santín & Feliu-Torruella 2020), Switzerland (Bernhard & Helbling 2024), and Turkey (Unal & Gunes 2024; Karadağ & Demirtaş 2018).

- North America (2 studies): Canada (Malboeuf-Hurtubise et al. 2021) And United States (Kinney 2022).

- Africa (2 studies): Explorations of Afrophilic philosophy (Bhurekeni 2022) and South Africa (Green & Condy 2016).

This geographical diversity suggests a growing global interest in the application of philosophical methodologies within educational contexts.

The studies employed a variety of research designs:

- Quasi-experimental (13 studies): (Alzahrani & Almutairi 2023; Gorard et al. 2017; Ho et al. 2023a; Karadağ & Demirtaş 2018; KarimiRad et al. 2022; Malboeuf-Hurtubise et al. 2021; Rahdar et al. 2018; Rombout et al. 2024; Säre et al. 2016; Siddiqui et al. 2017; Topping & Trickey 2014; Unal & Gunes 2024; Zulkifli & Hashim 2020).

- Qualitative (8 studies): (Bernhard & Helbling 2024; Bhurekeni 2022; Birsyada et al. 2024; Dalim et al. 2022; Green & Condy 2016; Rombout et al. 2022; Seuba & Castelló 2015; Shi 2024).

- Case study (6 studies): (Archila 2015; Boa et al. 2018; Hashim et al. 2014; Lam 2021, 2019; Morais et al. 2017).

- Mixed-methods (2 studies): (Ho et al. 2023b; Li et al. 2024).

- Other (4 studies): (Fernández-Santín & Feliu-Torruella 2020; Gulevataya et al. 2023; Kinney 2022; Takada et al. 2022).

Participant information

The studies covered a broad spectrum of student populations, spanning diverse educational levels (33 studies):

- Preschool (4 studies): (Fernández-Santín & Feliu-Torruella 2020; Karadağ & Demirtaş 2018; Säre et al. 2016; Unal & Gunes 2024).

- Primary school (5 studies): (Alzahrani & Almutairi 2023; Gorard et al. 2017; KarimiRad et al. 2022; Malboeuf-Hurtubise et al. 2021; Siddiqui et al. 2017).
- Secondary school (12 studies): (Archila 2015; Birsyada et al. 2024; Gulevataya et al. 2023; Hashim et al. 2014; Lam 2021, 2019; Morais et al. 2017; Rahdar et al. 2018; Rombout et al. 2024, 2022; Seuba & Castelló 2015; Shi 2024; Topping & Trickey 2014; Zulkifli & Hashim 2020).
- Higher education (11 studies): This included healthcare students (Ho et al. 2023b), medical education participants (Takada et al. 2022), pharmacy students (Kinney 2022), pre-service teachers (Green & Condy 2016), residents, fellows and teachers' views (Dalim et al. 2022), and undergraduate business students (Boa et al. 2018).
- Specific learner groups (1 study): (Li et al. 2024).

Sample sizes showed considerable variation, ranging from small qualitative studies with a limited number of participants (e.g. Dalim et al. 2022, with N=5 teachers) to larger quantitative studies involving hundreds or even thousands of students (e.g. Rombout et al. 2024, with N=437; Siddiqui et al. 2017, with N=2722; Gorard et al. 2017, with N=3159). This variation in sample size is reflective of the diversity of research designs employed.

Intervention details

The studies covered a wide range of philosophical methods and interventions to foster critical thinking and related skills in students. These approaches can be broadly categorised by their primary focus and methodology.

A substantial number of studies (at least 14 out of 33) utilised interventions based on the Philosophy for Children (P4C) or Philosophy with Children (PwC) approach and its associated community of inquiry pedagogy. These studies include Alzahrani and Almutairi (2023), Bhurekeni (2022, exploring 'Afrophilic P4C'), Gorard et al. (2017), Green and Condy (2016), Hashim et al. (2014, examining 'Hikmah Pedagogy' based on P4C), Karadağ and Demirtaş (2018), KarimiRad et al. (2022), Malboeuf-Hurtubise et al. (2021), Rahdar et al. (2018), Säre et al. (2016), Siddiqui et al. (2017), Topping and Trickey (2014), Unal and Gunes (2024) and Zulkifli and Hashim (2020). These interventions typically involved facilitated philosophical discussions within a group setting, aiming to develop critical, creative, caring and collaborative thinking through dialogue sparked by various stimuli.

Several studies employed variations of the Socratic method or Socratic questioning, focusing on structured questioning to stimulate critical thinking, analysis and reflection. This approach was central to interventions described by Boa et al. (2018, developing a 'Blended Socratic Method' instructional model), Dalim et al. (2022, exploring teachers' views on the Socratic method), Ho et al. (2023a, applied in healthcare education; 2023b, used with mind mapping), Kinney (2022, in a critical care elective) and Takada et al. (2022, using a 'Modified Socratic Method' in medical education).

Other studies implemented interventions that integrated philosophical inquiry into specific curriculum areas or utilised distinct philosophical frameworks:

- Dialogic/discussion-based interventions: Bernhard and Helbling (2024) developed a rating instrument to measure the quality of philosophical dialogue. Rombout et al. (2022, 2024) focused on designing and implementing specific classroom dialogue interventions to promote value-loaded critical thinking in philosophy classes.
- Philosophy integrated into subjects: Archila (2015) used History and Philosophy of Science (HPS) to promote argumentation in science. Birsyada et al. (2024) proposed a Hybrid Dialogue integrating Javanese philosophy into history education. Lam (2021, 2019) explored integrating Philosophy in Schools (PIS) into the English curriculum. Morais et al. (2017) utilised Constructive Controversy in philosophy teaching. Shi (2024) examined teaching Philosophy of Science (POS) with critical questions in secondary school science.
- Philosophy-based language teaching (PBLT): Li et al. (2024) focused on the efficacy of PBLT for EFL learners.
- Specific practices and tools: Fernández-Santín and Feliu-Torruella (2020) drew upon the Philosophy of Reggio Emilia for early childhood critical thinking development in arts education. Gulevataya et al. (2023) implemented a Philosophical Diary as part of a digital asceticism methodology. Seuba and Castelló (2015) explored Collaborative Writing as a method for learning philosophical thinking.

The duration and frequency of the interventions varied considerably across studies. Some interventions were relatively short-term, spanning a few weeks or months (e.g. Alzahrani & Almutairi 2023, with three months of P4C sessions; Kinney 2022, with an eight-week critical care elective), while others were more sustained or integrated into

the curriculum over a more extended period, such as a school year (Rombout et al. 2024; Säre et al. 2016).

Outcome measures and key findings

The studies employed a variety of outcome measures to assess the impact of philosophical interventions on students' critical thinking skills and related outcomes. These measures included:

- Standardised tests: Gorard et al. (2017) used Cognitive Abilities Tests (CATs) and Key Stage 2 attainment data. Kinney (2022) used the Health Sciences and Reasoning Test (HSRT). Rahdar et al. (2018) employed the Sosu Critical Thinking Disposition Scale and the Muris et al. Self-Efficacy Questionnaire. Zulkifli and Hashim (2020) utilised the Ujian Kemahiran Menaakul (Test for Reasoning Skills).
- Researcher-developed assessments: Several studies developed their own assessments tailored to the specific critical thinking skills or learning outcomes targeted by the intervention (e.g. Ho et al. 2023a assessed critical thinking based on nine intellectual dimensions; KarimiRad et al. 2022 used a researcher-made questionnaire for thinking skills related to healthy breakfast consumption; Rombout et al. 2024 used a value-loaded critical thinking assessment; Säre et al. 2016 used a scale for critical thinking through philosophical inquiry).
- Qualitative analysis of student discourse: Numerous studies analysed student discussions, written work or online posts to assess the quality of reasoning, argumentation patterns and communication (e.g. Birsyada et al. 2024 analysed interactions via Epstein's socio-cultural approach; Rombout et al. 2022 analysed dialogues; Seuba & Castelló 2015 analysed collaborative writing interactions; Shi 2024 used Toulmin's argumentation patterns). Bernhard and Helbling (2024) focused specifically on developing and applying a high-inference rating instrument for philosophical dialogue quality.
- Student self-assessments and reflections: Some studies utilised student self-ratings, reflective journals or interviews to gauge students' perceptions of their own critical thinking development. Gulevataya et al. (2023) used reflections from a philosophical diary.
- Observations: Many studies used observation methods to gather data on student interactions, participation and behaviours in philosophical inquiry settings (e.g. Alzahrani & Almutairi 2023; Karadağ & Demirtaş 2018; Topping & Trickey 2014; Unal & Gunes 2024).

The key findings across the studies offer compelling evidence that philosophical inquiry can positively impact various facets of critical thinking:

- **Enhanced reasoning and argumentation:** Several studies documented significant improvements in students' capacity to construct logical arguments, provide justifications for their claims, identify fallacies and engage in reasoned debate (Archila 2015; Boa et al. 2018; Hashim et al. 2014; Ho et al. 2023a, 2023b; Kinney 2022; Lam 2019, 2021; Morais et al. 2017; Rahdar et al. 2018; Rombout et al. 2024; Säre et al. 2016; Shi 2024; Takada et al. 2022; Topping & Trickey 2014; Zulkifli & Hashim 2020). For instance, Ho et al. (2023a) determined that employing the Socratic method in a biochemistry laboratory course significantly improved medical students' critical thinking skills, particularly in the dimensions of 'clarity' and 'logic'. Rombout et al. (2024) demonstrated that a philosophy classroom dialogue intervention enhanced secondary school students' ability to reference moral values and engage in critical reasoning.
- **Improved communication and collaboration:** Research consistently highlighted the beneficial effects of philosophical inquiry on students' communication skills, active listening and capacity to engage in respectful and productive dialogue (Alzahrani & Almutairi 2023; Bernhard & Helbling 2024; Green & Condy 2016; Hashim et al. 2014; Seuba & Castelló 2015; Siddiqui et al. 2017; Topping & Trickey 2014). The community of inquiry approach fostered a collaborative learning environment where students were actively involved in learning (Birsyada et al. 2024). Through this, they learned to articulate their ideas clearly, listen attentively to others' perspectives and respond constructively to divergent viewpoints.
- **Increased metacognitive awareness:** Several studies presented evidence that philosophical interventions helped students to become more cognisant of their own thinking processes. This often led to improved self-regulation, reflection and metacognitive monitoring (Gulevataya et al. 2023; Ho et al. 2023b; Rombout et al. 2022). For example, Gulevataya et al. (2023) found that keeping a philosophical diary was useful for developing skills in interacting with devices, working with information and improving digital hygiene and security.
- **Development of non-cognitive skills:** Beyond specific cognitive skills, some studies reported positive impacts on non-cognitive outcomes. This included communication, sociability, self-confidence, determination, willingness to try new things and happiness (Alzahrani & Almutairi 2023); learner agency and ethical reasoning (Bhurekeni 2022); teachers' perceptions of improved pupil

confidence (Gorard et al. 2017); autonomy and reduced anxiety (Malboeuf-Hurtubise et al. 2021); self-efficacy (Rahdar et al. 2018); teamwork, resilience and empathy (Siddiqui et al. 2017); and moral perception and social rules (Unal & Gunes 2024).

- **Transfer of skills:** A crucial question remains: can the critical thinking skills cultivated through philosophical inquiry transfer to other contexts? Some studies provided evidence of transfer or application beyond the immediate intervention setting (Rombout et al. 2022, 2024). Specifically, Rombout et al. (2024) ascertained that skills developed in philosophy classroom dialogues transferred to performance on tasks that required value-loaded critical thinking. This suggests that philosophical inquiry can equip students with skills applicable beyond the specific context of the intervention.

- **Value added for different fields:** The studies show positive improvement for students across various disciplines. These include historical thinking (Birsyada et al. 2024), healthcare and medical education (Ho et al. 2023a, 2023b; Kinney 2022; Takada et al. 2022), promoting healthy behaviours (KarimiRad et al. 2022), language learning (Lam 2019, 2021; Li et al. 2024), and science (Shi 2024).

Synthesis and interpretation

The findings of this scoping review, drawing on 33 studies, offer compelling evidence that philosophical inquiry, implemented through various methodologies such as P4C, community of inquiry, Socratic questioning, and curriculum integration, can be a valuable pedagogical tool for cultivating critical thinking skills in students across a broad spectrum of educational levels and contexts. The studies consistently reported positive impacts on core facets of critical thinking, encompassing reasoning, argumentation, communication, collaboration, and metacognitive awareness.

The consistency of these findings across diverse geographical locations (from Europe and Asia to North America and Africa), educational settings (preschool, elementary, secondary, higher education) and student populations (including EFL learners, healthcare students and pre-service teachers) suggests that the benefits of philosophical inquiry are not restricted to specific cultural contexts or educational systems. The findings also underscore the adaptability of philosophical methods, which have been effectively integrated into various subjects and curricula, including language arts, science, history, medical education and art education (Birsyada et al. 2024; Fernández-Santín & Feliu-Torruella 2020; Ho et al. 2023a, 2023b; Kinney 2022; Lam 2019, 2021; Li et al. 2024; Shi 2024; Takada et al. 2022).

While the majority of studies reported positive outcomes, it is imperative to acknowledge certain nuances and variations in the findings. The specific critical thinking skills that were most robustly impacted varied somewhat across studies, contingent upon the nature of the intervention, the outcome measures employed and the specific focus of the research. For example, some studies emphasised argumentation skills (Archila 2015; Morais et al. 2017; Shi 2024), while others focused more on communication and collaboration (Alzahrani & Almutairi 2023; Bernhard & Helbling 2024; Seuba & Castelló 2015; Topping & Trickey 2014). Similarly, while many studies focused on broad critical thinking (Boa et al. 2018; Li et al. 2024; Rahdar et al. 2018), others targeted specific dimensions like value-loaded critical thinking (Rombout et al. 2022, 2024) or the components of reflective scepticism and critical openness (Rahdar et al. 2018).

The findings pertaining to the transfer of critical thinking skills are particularly significant. While further research is warranted in this area, the evidence from studies like Rombout et al. (2024) suggests that philosophical inquiry can equip students with skills that are not only relevant within the philosophical context but are also transferable to other academic disciplines and real-world situations, including ethical decision-making (Bhurekeni 2022) and navigating digital environments (Gulevataya et al. 2023). Topping and Trickey (2014) also found that cognitive gains were sustained from primary school into high school. This suggests that philosophical inquiry can equip students with skills that are applicable beyond the specific context of the intervention. This is a crucial finding, as the ultimate objective of fostering critical thinking is to empower students to apply these skills in diverse contexts throughout their lives. The added value demonstrated for different fields underscores this transferability and practical relevance.

Table 1: Characteristics and findings of included studies

Authors (Year)	Country	Educational level	Sample size (N)	Study design	Philosophical approach	Key findings
Alzahrani & Almutairi (2023)	Saudi Arabia	Primary school	28	Quasi-experimental	Philosophy for Children	P4C sessions showed promising results in improving students' non-cognitive skills (communication, sociability, self-confidence, determination, willingness to try new things, happiness, solving problems).
Archila (2015)	France	High school	63	Qualitative (analysis of written/oral arguments, recordings, notes)	History and Philosophy of Science (HPS) to promote argumentation	TLS based on HPS (discovery of oxygen) was useful for promoting students' argumentation and awareness of scientific progress.
Bernhard & Helbling (2024)	Switzerland	Secondary school	63	Qualitative (high-inference rating instrument development and application)	Philosophical dialogue	Developed a reliable high-inference rating instrument to assess the quality of philosophical dialogue (Philosophical Richness, Co-construction, Focus, Restrained Facilitation).
Bhurekeni (2022)	South Africa	Primary school	15	Qualitative (formative interventionist methodology)	Afrophilic 'Philosophy for Children' approach	Fostered critical reflexive thinking, ethical reasoning, and learner agency in environmental ethics education, linking local knowledge to conservation.
Birsyada et al. (2024)	Indonesia	Secondary school	108	Qualitative (multi-case methodology; classroom observations)	Hybrid dialogue (integrating Javanese philosophy)	Hybrid dialogue improved student engagement and Historical Thinking and Reasoning (HTR) abilities by connecting historical facts to cultural/ethical context.

Authors (Year)	Country	Educational level	Sample size (N)	Study design	Philosophical approach	Key findings
Boa et al. (2018)	Thailand	Higher education	371	Descriptive (survey) and developmental (model validation)	Blended Socratic method of teaching	Undergraduate business students had deficient critical thinking skills; developed BSMT model was validated as highly appropriate for enhancing these skills.
Dalim et al. (2022)	Malaysia	Secondary school	5	Qualitative (semi-structured interviews)	Socratic method	Teachers had positive views on Socratic method for enhancing critical thinking but faced challenges (content knowledge, questioning methods, participation, topics, time).
Fernández-Santín & Feliu-Torruella (2020)	Spain	Primary school	8	Qualitative (design-based research; behavioral monitoring)	Philosophy of Reggio Emilia (in arts education)	Reggio Emilia philosophy in arts activities can foster curricular developments for developing critical thinking in infants.
Gorard et al. (2017)	England	Primary school	3159	Quasi-experimental	Philosophy for Children	Small positive effects on attainment in reading (+0.12) and maths (+0.10), and even smaller on CAT scores (+0.07) and writing (+0.03). Larger effects for disadvantaged pupils.
Green & Condy (2016)	South Africa	Higher education	74	Qualitative (interpretivist paradigm; focus groups)	Philosophical enquiry	Pre-service teachers perceived philosophical enquiry as relevant for implementing the CAPS curriculum and developing critical/cognitive skills.
Gulevataya et al. (2023)	Russia	Secondary school	30	Quantitative (results of pedagogical experiment)	Philosophical diary	Use of philosophical diary helped develop skills in interacting with devices, working with information, digital hygiene and security, and promoted reflection.

Authors (Year)	Country	Educational level	Sample size (N)	Study design	Philosophical approach	Key findings
Hashim et al. (2014)	Malaysia	Secondary school	188	Descriptive/evaluation	Hikmah (wisdom) pedagogy (based on P4C)	Pedagogy positively influenced participants' perceptions of their thinking/reasoning skills and showed improvement in cognitive and social-communicative skills.
Ho et al. (2023a)	Taiwan	Higher education	144	Quasi-experimental	Socratic method	Socratic learning model effectively developed critical thinking skills, particularly in "clarity" and "logic" dimensions.
Ho et al. (2023b)	Taiwan	Higher education	49	Mixed-methods	Socratic method; interdisciplinary dialogue; mind mapping	Interdisciplinary dialogue coupled with mind-mapping techniques fostered critical thinking mindset and enhanced ability to evaluate medical/life science information.
Karadağ & Demirtaş (2018)	Turkey	Pre-school	30	Quasi-experimental	Philosophy with children (PwC) curriculum	The PwC curriculum was effective on critical thinking skills of pre-school children.
KarimiRad et al. (2022)	Iran	primary school	120	Randomised clinical trial	Philosophy for Children-based educational program	Program improved students' critical thinking, caring, and creative thinking skills related to healthy breakfast consumption.
Kinney (2022)	USA	Higher education	34	Descriptive/educational activity evaluation	Socratic method	Applying the Socratic method in a high-pressure critical care elective significantly improved critical thinking, clinical reasoning, and APPE readiness.
Lam (2019)	Hong Kong	Secondary school	4	Case study	Philosophy in Schools (PIS) integrated into English curriculum	Integrating PIS played an important role in promoting critical and creative thinking and enhancing English language proficiency.

Authors (Year)	Country	Educational level	Sample size (N)	Study design	Philosophical approach	Key findings
Lam (2021)	Hong Kong	Secondary school	62	Case study	Philosophy in Schools (PIS) integrated into Integrated Humanities curriculum	Integrating PIS promoted students' critical thinking, creative thinking, and English language proficiency.
Li et al. (2024)	Bangladesh	EFL learners	75	Mixed-methods	Philosophy-Based Language Teaching (PBLT)	PBLT had a substantial positive effect on EFL learners' critical thinking abilities, engagement, and academic achievement.
Malboeuf-Hurtubise et al. (2021)	Canada	primary school	57	Randomised cluster trial (quasi-experimental)	Philosophy for Children	P4C intervention increased autonomy and reduced anxiety in primary school children.
Morais et al. (2017)	Portugal	Secondary school	144	Qualitative (evaluation of philosophical essays)	Constructive controversy	Using constructive controversy showed advantages over traditional methods for developing argumentative skills in philosophy students.
Rahdar et al. (2018)	Iran	High school	54	Quasi-experimental	Teaching Philosophy for Children	Teaching philosophy for children had a positive impact on increasing self-efficacy, critical thinking, critical openness, and reflective skepticism.
Rombout et al. (2022)	Netherlands	Secondary school	283	Exploratory multiple case study	Teaching strategies for value-loaded critical thinking in philosophy classroom	Identified and described teaching strategies for addressing, applying, and arguing about moral values to promote value-loaded critical thinking.

Authors (Year)	Country	Educational level	Sample size (N)	Study design	Philosophical approach	Key findings
Rombout et al. (2024)	Netherlands	Secondary school	437	Quasi-experimental; pre-test post-test	Value-loaded critical thinking (philosophy classroom dialogue)	Specifically designed dialogic intervention enhanced students' capacities in value-loaded critical thinking, especially referring to moral values.
Säre et al. (2016)	Estonia	Pre-school	125	Quasi-experimental	Philosophy for Children	Program improved pre-schoolers' verbal reasoning skills, particularly in comparison, analogy, justification, and causal connection.
Seuba & Castelló (2015)	Spain	Secondary school	45	Qualitative (study of collaborative writing)	Collaborative writing (using writing as an epistemic tool)	Collaborative writing helped students transform ideas into concepts, use philosophical concepts, problematize ideas, and provide arguments. Quality of interaction related to text quality.
Shi (2024)	China	Secondary school	63	Qualitative (deductive thematic and qualitative comparative analyses)	Teaching Philosophy of Science (POS) with critical questions	Explicit pedagogical method using critical questions in POS improved students' argumentation.
Siddiqui et al. (2017)	England	Primary school	2722	Quasi-experimental	Philosophy for Children	P4C intervention showed small positive effects on non-cognitive skills (social/communication, teamwork/resilience, empathy), more so for disadvantaged pupils.
Takada et al. (2022)	Japan	Higher education	281	Descriptive/activity evaluation	Modified Socratic method	Effective educational method for improving recognition and understanding of medical concepts through structured questions and answers in a large group setting.

Authors (Year)	Country	Educational level	Sample size (N)	Study design	Philosophical approach	Key findings
Topping & Trickey (2014)	Scotland	Primary school	180	Quasi-experimental	Philosophy for Children	P4C improved teacher questioning, pupil participation and reasoning; found sustained cognitive gains into secondary school & improved socio-emotional aspects.
Unal & Gunes (2024)	Turkey	Preschool	48	Quasi-experimental; mixed-methods	Philosophy for Children	P4C implementations improved preschool children's perceptions of moral and social rules and enhanced cognitive/social-emotional development.
Zulkifli & Hashim (2020)	Malaysia	Secondary school	61	Quasi-experimental	Philosophy for Children	P4C intervention helped improve students' critical thinking skills.

Discussion

This scoping review offers a comprehensive overview of the existing literature concerning the utilisation of philosophical methods and interventions to cultivate critical thinking skills in students, outside the field of religious education. The 33 included studies, spanning diverse geographical locations, educational levels, and methodological approaches, consistently demonstrate the positive impact of philosophical inquiry on various facets of critical thinking. This section discusses the key findings in relation to the research questions, compares these findings with the broader literature, explores the strengths and limitations of the review, and considers the implications for practice and future research.

Summary of key findings and interpretation

The review's findings robustly support the central premise that philosophical inquiry serves as a valuable pedagogical instrument for cultivating critical thinking skills in students. Several key themes emerged from the analysis of the 33 studies:

1. **Enhanced reasoning and argumentation:** A prominent finding across multiple studies was the significant improvement in students' reasoning and argumentation abilities (Archila 2015; Boa et al. 2018; Hashim et al. 2014; Ho et al. 2023a 2023b; Kinney 2022; Lam 2019, 2021; Morais et al. 2017; Rahdar et al. 2018; Rombout et al. 2024; Säre et al. 2016; Shi 2024; Takada et al. 2022; Topping & Trickey 2014; Zulkifli & Hashim 2020). This improvement manifested in students' increased capacity to construct logical arguments, provide evidence-based justifications for their claims, identify fallacies in reasoning, and engage in reasoned debate. The structured nature of philosophical dialogue, with its emphasis on clarity, precision, and logical coherence (Bernhard & Helbling 2024) appears to – offer an ideal environment for developing these crucial skills. The Socratic method, in particular, as demonstrated by Ho et al. (2023), proved effective in prompting students to scrutinise their assumptions and refine their reasoning. Teaching Philosophy of Science also showed significant improvement in argumentation (Shi 2024).
2. **Improved communication and collaboration:** The findings consistently highlighted the positive influence of philosophical inquiry on students' communication and collaboration skills (Alzahrani & Almutairi 2023; Bernhard & Helbling 2024; Birsyada et al. 2024; Green & Condy 2016; Hashim et al. 2014; Seuba & Castelló 2015; Siddiqui et al. 2017; Topping & Trickey 2014). The community of inquiry approach, central to P4C and other dialogic methods, creates a space for students to practice articulating their ideas clearly, listening

attentively to diverse perspectives, and responding respectfully and constructively to divergent viewpoints. This collaborative environment fosters not only intellectual growth but also the development of crucial social and communication skills essential for success in academic, professional, social, and personal life. Hybrid dialogue, for example, was shown to improve student engagement (Birsyada et al. 2024).

3. **Increased metacognitive awareness:** A significant outcome reported in several studies was the enhancement of students' metacognitive awareness and reflective capabilities (Gulevataya et al. 2023; Ho et al. 2023b; Rombout et al. 2022). Philosophical inquiry, by its very nature, encourages students to reflect on their own thinking processes, to become cognisant of their assumptions and biases, and to monitor their comprehension. Using a philosophical diary was found useful for developing skills in interacting with devices and working with information, incorporating self-reflection (Gulevataya et al. 2023). This increased metacognitive awareness is a hallmark of critical thinking and is indispensable for lifelong learning.

4. **Development of non-cognitive skills:** The review also revealed the positive impact of philosophical inquiry on a range of non-cognitive skills and affective outcomes. These included improvements in moral perception and social rules (Unal & Gunes 2024), communication, sociability, self-confidence, determination, willingness to try new things, and happiness (Alzahrani & Almutairi 2023), teamwork, resilience, and empathy (Siddiqui et al. 2017), self-efficacy (Rahdar et al. 2018), learner agency and ethical reasoning (Bhurekeni 2022), and autonomy and reduced anxiety (Malboeuf-Hurtubise et al. 2021). Gorard et al. (2017) reported positive effects on pupil confidence. These findings suggest that philosophical inquiry contributes to students' holistic development, fostering not only cognitive abilities but also personal and social growth.

5. **Transfer of skills:** A crucial question addressed by several studies is whether the critical thinking skills cultivated through philosophical inquiry can be transferred to other contexts (Rombout et al. 2022, 2024). The evidence from studies like Rombout et al. (2024), showing transfer to tasks requiring value-loaded critical thinking, is particularly promising. Topping and Trickey (2014) also found that cognitive gains from P4C were sustained years later. Furthermore, the successful application of philosophical methods to improve thinking in specific fields like healthcare (Ho et al. 2023a, 2023b; Kinney 2022; Takada et al. 2022), history (Birsyada et al. 2024), science (Archila 2015; Shi

2024), language learning (Lam 2019, 2021; Li et al. 2024), and health-related behaviors (KarimiRad et al. 2022) provides strong evidence of the practical applicability and transferability of these skills beyond the immediate philosophical context.

Comparison with existing literature

The findings from the studies included in this scoping review are largely congruent with, and significantly extend the existing body of literature concerning the benefits of philosophical inquiry in education. Prior research including meta-analyses and systematic reviews (although these were excluded from this scoping review's dataset, focusing instead on primary studies) has consistently demonstrated the positive effects of P4C and other philosophical approaches on students' cognitive and non-cognitive development (e.g. Garcia-Moriyón, Rebollo & Colom 2005; Trickey & Topping 2004). This review builds upon this existing evidence by providing a more focused and up-to-date examination of the literature published between 2014 and 2024, specifically excluding studies within religious education, and by encompassing a broader and more detailed range of philosophical approaches beyond traditional P4C, including various forms of Socratic dialogue, curriculum-integrated philosophy, and culturally adapted methods (Ho et al. 2023a, 2023b; Shi 2024; Birsyada et al. 2024; Lam 2019, 2021; Bhurekeni 2022).

The consistent demonstration of enhanced reasoning, argumentation, and communication skills across these diverse studies reinforces previous findings on the cognitive benefits of philosophical dialogue. Moreover, the frequent reporting of improvements in non-cognitive outcomes such as empathy, self-confidence, and social skills (Alzahrani & Almutairi 2023; Siddiqui et al. 2017; Unal & Gunes 2024) aligns with and expands upon the understanding of the holistic developmental impact of these approaches. The inclusion of studies across all educational levels, from preschool (Karadağ & Demirtaş 2018; Unal & Gunes 2024) to higher education and professional training (Ho et al. 2023a, 2023b; Kinney 2022; Takada et al. 2022), underscores the applicability of philosophical inquiry across the educational lifespan, mirroring some findings in older literature but with more recent evidence.

The increasing emphasis on the transfer of critical thinking skills to different academic domains and real-world contexts within the included studies (Birsyada et al. 2024; Ho et al. 2023b; Rombout et al. 2024; Shi 2024;) aligns with a growing body of research highlighting the importance of teaching for transfer (Perkins & Salomon 1992). While the evidence for transfer in this review is encouraging and supported by specific examples of application in various fields, it also underscores the imperative for further

research to investigate the conditions under which transfer is most likely to occur and the specific pedagogical strategies that can facilitate it effectively across different subjects and contexts. The development of tools to measure dialogue quality (Bernhard & Helbling 2024) and the exploration of teacher perspectives and challenges (Dalim et al. 2022; Green & Condy 2016) represent areas that are gaining increased attention in recent literature, adding valuable insights into the practicalities of implementation.

Strengths and limitations of the review

This scoping review possesses several key strengths:

- **Comprehensive search strategy:** The utilisation of two major databases (Scopus and Web of Science), a carefully developed and iteratively refined search strategy, and a broad spectrum of keywords ensured a comprehensive search of the relevant literature.
- **Rigorous study selection:** The two-stage screening process, involving two independent reviewers and clearly outlined study eligibility criteria, minimised bias and ensured that only relevant studies were included.
- **Detailed data extraction:** The utilisation of a standardised data extraction form and dual data extraction further enhanced the rigour and accuracy of the data collection process.
- **Transparent reporting:** The Methods section provides a detailed and transparent account of all stages of the review process, enhancing replicability.

However, the review also has certain limitations that warrant acknowledgment:

- **Scope, not depth:** As a scoping review, the primary objective was to map the breadth of the literature, rather than to conduct an in-depth critical appraisal of the methodological quality of individual studies. While study design was considered, a formal risk-of-bias assessment was not undertaken. Consequently, the strength of the evidence from individual studies cannot be definitively ascertained.
- **Language restriction:** The restriction to English-language studies may have excluded relevant research published in other languages. This could introduce a bias towards research conducted in English-speaking nations.
- **Potential for publication bias:** As with any review, there exists a potential for publication bias, wherein studies with positive findings are more likely to be

published than those with null or negative findings. This could lead to an overestimation of the efficacy of philosophical interventions.

- **Heterogeneity of studies:** The included studies exhibited considerable variation in terms of their interventions, outcome measures, and student populations. This heterogeneity, while reflecting the diversity of the field, makes it challenging to draw definitive conclusions regarding the overall effectiveness of philosophical inquiry.
- **Focus on non-religious education:** While a strength in terms of providing a focused analysis of philosophy's role independent of religious doctrine, the exclusion of religious education contexts means that insights into how philosophical inquiry might specifically interact with or be impacted by religious content are not captured here.
- **No quality assessment:** This review did not conduct any quality assessment.

Implications for practice and research

The findings of this scoping review have significant implications for both educational practice and future scholarly inquiry into the role of philosophical methods in fostering critical thinking:

- Implications for practice:
    - **Wider implementation of philosophical inquiry:** The robust and consistent evidence across diverse educational levels and geographical locations strongly supports the wider implementation of philosophical inquiry in educational settings. Approaches such as P4C, the Socratic method, and various forms of dialogic and curriculum-integrated philosophy have demonstrated positive impacts on critical thinking and related skills (Ho et al. 2023a, 2023b; Karadağ & Demirtaş 2018; Li et al. 2024; Rombout et al. 2024; Siddiqui et al. 2017).
    - **Teacher training and development:** Effective implementation of philosophical inquiry is dependent on well-prepared educators. The review highlights the importance of equipping teachers with the necessary skills to facilitate philosophical discussions, manage diverse perspectives, and foster a supportive community of inquiry (Dalim et al. 2022; Green & Condy 2016). Professional development programs should focus on these pedagogical competencies, potentially utilising tools for evaluating dialogue quality (Bernhard & Helbling 2024).

- **Strategic curriculum integration:** Philosophical inquiry should be viewed not as an isolated subject but as a valuable pedagogical approach that can be integrated into various subjects. The studies demonstrate successful integration into language arts, science, history, and healthcare education, enhancing subject-specific understanding and critical engagement with content (Birsyada et al. 2024; Ho et al. 2023a; Lam 2019, 2021; Li et al. 2024; Shi 2024).
- **Focus on holistic development:** Educators should leverage philosophical inquiry to foster not only cognitive critical thinking but also essential non-cognitive skills, including communication, collaboration, empathy, and self-confidence (Alzahrani & Almutairi 2023; Siddiqui et al. 2017; Unal & Gunes 2024).
- **Promoting transfer of skills:** Conscious efforts should be made to facilitate the transfer of critical thinking skills developed through philosophical inquiry to other academic and real-world contexts. This could involve explicitly connecting philosophical concepts to everyday issues and encouraging students to apply reasoning skills in different problem-solving situations (Rombout et al. 2024).

- **Implications for future research**
  - **Longitudinal studies:** More longitudinal research is needed to investigate the sustained effects of philosophical interventions on critical thinking development and other outcomes over extended periods, tracking students into following educational stages and beyond (Topping & Trickey 2014).
  - **Transfer studies:** Further rigorous research is crucial to better understand the mechanisms and conditions under which critical thinking skills cultivated through philosophical inquiry are transferred to novel domains and real-world problem-solving.
  - **Mechanisms of impact:** Research should delve deeper into the specific cognitive and socio-emotional processes through which philosophical dialogue and inquiry lead to improvements in critical thinking and related skills.
  - **Contextual factors and adaptations:** Future research should explore how contextual factors, including cultural background, socioeconomic status, teacher characteristics, and the specific learning environment, influence the

effectiveness and implementation of philosophical interventions (Bhurekeni 2022; Birsyada et al. 2024; Dalim et al. 2022).

- **Assessment and measurement:** Continued development and validation of nuanced assessment tools are needed to capture the Complex nature of critical thinking and the unique contributions of philosophical inquiry, including the quality of dialogue and argumentation in different contexts (Bernhard & Helbling 2024; Shi 2024).
- **Comparative effectiveness:** Studies that directly compare the efficacy of different philosophical approaches (e.g. P4C vs. Socratic method, integrated vs. standalone programs) for specific outcomes or student populations would provide valuable insights for pedagogical decision-making.
- **Qualitative research:** More in-depth qualitative studies are needed to capture student and teacher experiences, the nuances of classroom interactions, and the perceived value and challenges of implementing philosophical inquiry in practice.
- **Technology integration:** Research exploring the potential benefits and challenges of integrating digital tools and technology into philosophical inquiry to enhance critical thinking is also warranted (Boa et al. 2018; Gulevataya et al. 2023).

Conclusion

This scoping review provides compelling evidence that philosophical inquiry, implemented through a variety of methodologies and across diverse educational contexts, can significantly enhance students' critical thinking skills. The findings underscore the potential of philosophical approaches, such as P4C and the Socratic method, to foster reasoning, argumentation, communication, collaboration, and metacognitive awareness. While further research is needed to explore the long-term effects, the mechanisms of action, and the conditions for optimal transfer, the existing evidence robustly supports the wider implementation of philosophical inquiry in education as a means of equipping students with the essential critical thinking skills they require to thrive in the 21st century. The review underscores the importance of teacher training, curriculum integration, and a focus on transfer to maximise the benefits of this potent pedagogical approach.

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