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Protocol for a meta-review in teacher education and professional development

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Background and review rationale

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Educational research is an ever-expanding field, requiring evidence syntheses that quickly and effectively provide up-to-date and relevant information to researchers, educators, and policy makers. This is true of the field of teacher education, where evidence-based reform in professional development has the potential to improve educational outcomes (Slavin, 2020). To collate all the relevant evidence, we must consider teacher education on a global scale, clarifying current research directions in the worldwide literature, the strength of evidence, and its relevance to practices at a local level. For the purpose of this review, we define teacher education as both initial teacher education (pre-service teacher preparation) and in-service professional development and learning (teacher education post qualification onwards).

In recent years, evidence syntheses in education have become increasingly more common (Bond et al., 2024). However, the number of reviews being undertaken has the potential to create 'research waste', where multiple syntheses are conducted on overlapping or similar topics (Grainger et al., 2020). Therefore, the logical next step in evidence syntheses is to combine and evaluate reviews, allowing policy makers and educators to consider all the available evidence.

What is a meta-review?

A meta-review, sometimes referred to as an "overview of reviews" (Hunt et al., 2018) or an "umbrella review" (Aromataris et al., 2015), is a distinct form of evidence synthesis with the aim of combining findings from different reviews on similar topics.

As with other forms of evidence synthesis, meta-reviews contribute to evidence-based decision making; however, they are distinct in their scope and methodology. While traditional secondary reviews investigate primary studies, meta-reviews produce a broader synthesis, taking the major findings of existing reviews and meta-analyses and synthesising them qualitatively. Although meta-reviews may include synthesis of individual meta-analysis studies, these tertiary reviews usually do not include any quantitative analysis. The purpose of a meta-review is to provide a higher-level overview and critical assessment of the existing landscape of reviews and the collective evidence therein on a given topic. This is achieved by summarising the findings of reviews thematically, addressing quality and methodological rigour, and highlighting any areas of consensus or discrepancy. Thus, meta-reviews ensure the best evidence is available to policy and decision makers.

Although the number of reviews in education has increased significantly over time, published meta-reviews remain scarce. One such meta-review, carried out by Cordingley et al. (2015), identified evidence about effective teacher professional development and learning (CPDL) published since 2000. This review sought to inform ongoing policy reviews taking place in England. The current meta-review will build upon

this work, critically analysing review papers globally to provide a comprehensive synthesis of interventions/approaches across both initial teacher education and in-service professional development programmes. The broad focus will encompass various research themes in teacher education including diverse demographics, educational contexts, research designs, and methodologies. At the moment, we intend for the scope to be broad, searching for papers regarding all teaching staff and school leaders. This inclusive scope will strengthen the confidence level in evidence of our outputs and create a sustainable, open-access database for the teacher education community. In addition, this meta-review will be a living one, meaning that new evidence syntheses relevant to our scope will be added periodically and analysed from the second year of the project, as funding allows.

Research questions

The meta-review will address the following research questions:

1. What topics and sub-topics in initial teacher education and in-service professional development have been reviewed?
2. What is the demographic distribution of participants (e.g. educational settings, countries/regions, subject/phase) in these reviews?
3. What kinds of evidence syntheses have been used?
4. What programmes or interventions are employed in initial teacher education and in-service professional development?
5. What are the key reported findings in these topics and sub-topics?
6. What is the quality of the synthesised evidence?

Methodology

The methodology follows that of Kitchenham et al. (2009), Chong et al. (2022) and Bond et al. (2024). In the first stage, background information for the review is identified by the research team, including the review objectives, research questions, reporting standards, team credentials, and drafting of terms synonymous to and associated with teacher education. The second stage relates to the search strategy, including development of the search terms with team agreement, establishment of inclusion and exclusion criteria and searches via databases, journal websites and hand searches. Given the exploratory nature of the review, we intend to cast the net as widely as possible to include all types of publications such as peer-reviewed journal articles, book chapters, and grey literature (e.g., conference proceedings, doctoral theses). As some reviews are published by research charities such as Teacher Development Trust,

Education Endowment Foundation etc., we will also include these published reports. Owing to resourcing constraints, only English language publications will be included, however including publications in other languages might be considered in the future. Furthermore, bibliometric reviews will be excluded as they do not synthesise intervention outcomes or effects.

All identified studies will be screened according to the inclusion and exclusion criteria in Table 1.

Table 1 ***Inclusion and exclusion criteria for meta-review texts***

Inclusion criteria	**Exclusion criteria**
The paper consists of synthesised evidence with a methods section and synthesised findings	The paper is a primary study, conceptual study, a literature review done in commentary style (i.e. a review without a methods section), Masters' thesis, or a bibliometric review.
The synthesis focuses on initial teacher education, in-service teacher continued professional development, or both.	The paper does not relate to initial teacher education or in-service teacher continued professional development.
The synthesis is published between 2013 and 2023*.	The synthesis is published before 2013*.
Published in English	Published in a language other than English

* The period reviewed may be subject to change after scoping to ensure that the deliverables are feasible within the time frame.

Search strategy for identification of studies

The search strategy will include database keyword searches, hand searches of relevant organisational websites (e.g. The Education Endowment Foundation, NFER, Campbell Collaboration, NIoT etc.), and use of a snowballing technique through OpenAlex (Priem et al., 2022) which is located within the EPPI Reviewer evidence synthesis software (Thomas et al., 2023). The OpenAlex platform indexes approximately 209 million publications and can be accessed through EPPI Reviewer. Here, citation and bibliography searching, as well as bidirectional checking of bi-citations and recommendations will be used to identify further literature.

We will include the following databases:

- Web of Science
- Scopus
- ProQuest
- African Journals Online
- EBSCOHost (including ERIC)
- EThOS
- OpenAlex (snowballing)

Piloting

Search terms were derived from consultation with educational professionals at the NIoT and the wider literature (adapted from Bond et al., 2024). Pilot searching was conducted on the 17th October 2023 and, after revision, on the 9th January 2024. Terms were discussed at length with the research team and revised as part of an iterative process.

The second phase of piloting was carried out across three databases, with limiters on years (2013–2024) and English language.

Piloting returned the following results:

- Scopus: 622 documents
- Web of Science: 447 documents
- Proquest: 551 documents

Piloting suggested that search results were largely relevant to our research question (Table 2) and most reviews had been published within the last five to ten years (Fig. 1).

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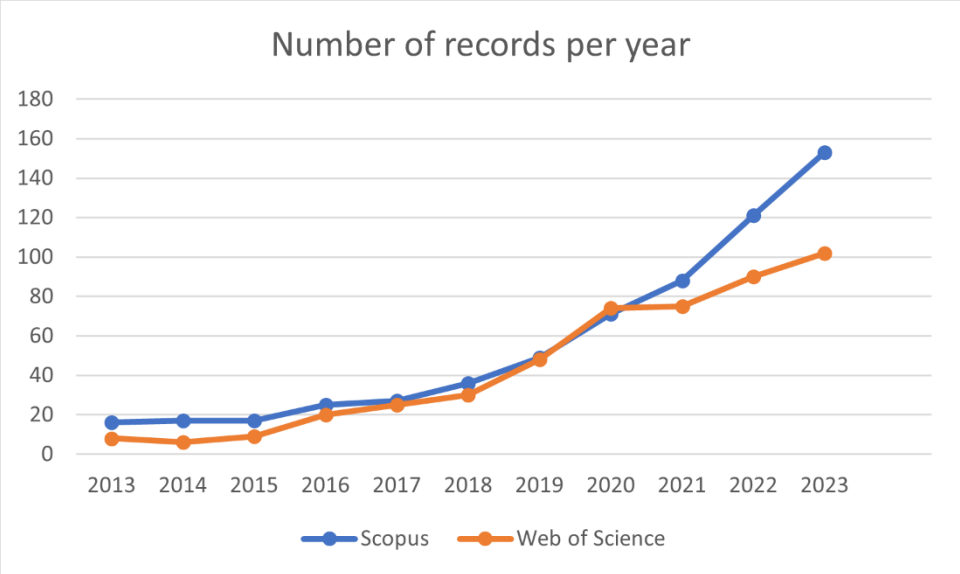
Table 2 ***An example of piloting results from the database Scopus***

Title	Authors	Journal	Year
Preparing Preschool Educators to Monitor Child Progress: A Best-Evidence Synthesis and Call to Action	Shepley et al.	Infants and Young Children	2024
Non-university-based Teacher Educators' professional learning: A Systematic Review	Liao et al.	Teaching and Teacher Education	2023
In-service STEM teachers professional development programmes: A systematic literature review 2018–2022	Surahman & Wang	Teaching and Teacher Education	2023
The Effect of Professional Development on In-service STEM Teachers' Self-efficacy: A Meta-Analysis of Experimental Studies	Zhou et al.	International Journal of STEM Education	2023
Impact of ICT-Driven Teacher Professional Development for the Enhancement of Classroom Practices in South Africa: A Systematic Review of Literature	Ajani & Govender	Journal of Education and Social Research	2023
The Use of Professional Development to Enhance Education of Students with Autism: A Systematic Review	Petersson-Bloom et al.	Education Sciences	2023
A Systematic Review of the Literature on Inservice Professional Development Explicitly Addressing Race and Racism	Matschiner	Review of Educational Research	2023
Professional Development Targeting Classroom Management and Behavioral Support Skills in Early Childhood Settings: A Systematic Review	Obee et al.	School Mental Health	2023
Teacher Professional Development and Student Reading in Middle and High School: A Systematic Review and Meta-Analysis	Basma & Savage	Journal of Teacher Education	2023

Figure 1 ***Number of search results by year from the databases Web of Science and Scopus***



The final search terms that will be used are listed in Table 3.

Table 3 ***Database search string***

Teacher professional development	"professional development" OR "teacher training" OR "initial teacher education" OR "teacher preparation" OR "continu* professional development" OR "pre-service teacher" OR "preservice teacher" OR "in-service teacher" OR "student teacher" OR "teacher professional learning" OR "teacher professional education" OR "INSET" OR "in-service education and training"
AND	
Education sector	"higher education" OR college* OR universit* OR undergrad* OR graduat* OR postgrad* OR "K-12" OR school* OR kindergarten* OR "primary school*" OR "middle school*" OR "high school*" OR "elementary school*" OR "secondary school*" OR "nursery school*" OR

	"early years" OR "early childhood education"
AND	
Evidence synthesis	"systematic review" OR "scoping review" OR "narrative review" OR "meta-analysis" OR "evidence synthesis" OR "meta-review" OR "evidence map" OR "rapid review" OR "umbrella review" OR "qualitative synthesis" OR "configurative review" OR "aggregative review" OR "thematic synthesis" OR "framework synthesis" OR "mapping review" OR "meta-synthesis" OR "qualitative evidence synthesis" OR "critical review" OR "integrative review" OR "integrative synthesis" OR "narrative summary" OR "state of the art review" OR "rapid evidence assessment" OR "qualitative research synthesis" OR "qualitative meta-summary" OR "meta-ethnography" OR "meta-narrative review" OR "mixed methods synthesis" OR "scoping study" OR "systematic map"

Data extraction and management

The third stage of the review (Chong et al., 2022), encompasses text screening and selection, with abstracts and whole texts screened by multiple members of the team, duplicates removed, and conflicts resolved. The screening process will be documented using a PRISMA diagram (Page et al., 2021).

To extract key data from synthesis papers (stage four; Chong et al., 2022), we will import texts into EPPI Reviewer (Thomas et al., 2023), extracting data with an

adaptation of the data extraction tool used in Bond et al. (2024) and resolve any further conflicts. Initially, key meta-data will be extracted (e.g. year of publication, geographic location etc.), as well as methodological information and key findings. The data extraction tool will be adapted to extract additional relevant and useable information identified by collaborators. A tentative version of the data extraction tool is available in Appendix A.

Appraisal of included reviews

All evidence synthesis papers which we will include in the review will be subject to critical appraisal, that is, an assessment of their quality and methodological rigour. We will use an adapted version of the 'A MeaSurement Tool to Assess Systematic Reviews 2' (AMSTAR 2; Shea et al., 2017) tool to assess the quality of syntheses, alongside the Database of Abstracts and Reviews of Effects (DARE) tool (Centre for Reviews and Dissemination, 1995; Lai & Bower, 2020), which has been used in previous tertiary reviews (e.g. Kitchenham et al., 2009; Tran et al., 2021). This adaptation was created and used in previous tertiary reviews (Bond et al., 2024; Buntins et al., 2023) and assesses the quality according to 10 criteria as shown in Table 4.

Table 4 ***Adaptation of the AMSTAR 2 and DARE tools, as used in Bond et al., (2024) and Buntins et al., (2023).***

Criterion	Score	Interpretation
RQs	Yes	RQs, aims or objectives are explicitly and clearly defined.
	Partly	Some mention of objectives or aims are alluded to.
	No	No RQs, aims or objectives are identifiable.
Inclusion/exclusion	Yes	The criteria used are explicitly defined in the paper.
	Partly	The criteria are implicit.
	No	The criteria are not defined and cannot be readily inferred.
Publication years	Yes	The publication years are clearly stated, e.g. 2010-2020.
	Partly	The publication years state from a year OR until a year.
	No	The publication years are not defined at all.
Search coverage	Yes	4 or more digital libraries searched and included additional search strategies (e.g. snowballing) OR identified and referenced all pertinent journals.

	Partly	3 or 4 digital libraries searched with no extra search strategies OR searched a defined but restricted set of journals and conference proceedings.
	No	2 digital libraries searched or an extremely restricted set of journals.
Search string	Yes	The search string was reported in full and is replicable.
	Partly	Examples of keywords only were given.
	No	The search terms were not provided in any form.
Inter-rater reliability	Yes	An inter-rater reliability value is reported (e.g. Cohen's kappa).
	Partly	Mention is made of how disagreements were reconciled.
	No	No inter-rater reliability is mentioned.
Data extraction	Yes	The full coding scheme was provided.
	Partly	Examples are provided, but not the full list.
	No	The coding scheme was not provided at all.
Quality assessment	Yes	Explicitly defined quality criteria extracted for each study.
	Partly	The research question involved quality issues that are addressed by the study.
	No	No explicit quality assessment of individual papers has been attempted.
Study description	Yes	Information is presented about each paper.
	Partly	Only summary information is presented about individual papers.
	No	The results for individual studies are not specified.
Review limitations	Yes	Yes, there is a specific identifiable limitations section.
	Partly	There is some mention of limitations.
	No	There is no limitations section or reflection on limitations.

Each of the 10 items are scored 1 point for yes, 0.5 points if an item is partially included, and 0 point for items not included. An overall score will be determined out of 10 and items identified as critically low (0-2.5), low (3-4.5), medium (5-7), high (7.5-8.5) or excellent (9-10) quality; an approach that is similar to other reviews (e.g. Urdaneta-Ponte et al., 2021). Quality assessment will be carried out by multiple members of the Evidence Synthesis team (see Personnel), with an initial 10 items being assessed by all members of the review team to achieve consistency, followed by each review being assessed by a minimum of two researchers. Quality scores will be reviewed, with any disagreements finalised by a senior researcher.

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Data synthesis

We will use systematic mapping to synthesise the review results into themes. To ensure that this review is useful to both the National Institute of Teaching (NIoT) and other international providers of teacher training, a combination of inductive and deductive coding will be used to synthesise the charted information, guided by the iterative process of coding in grounded theory (Charmaz, 2006). Specifically, some pre-determined topics or focuses will be elicited from the NIoT's programmes team as well as the recent sector-wide research consultation by the NIoT to inform the qualitative coding process (NIoT, 2024). At the same time, open coding will be conducted to ensure all themes in the synthesised literature are fully captured. Once again, if there are any conflicts within the research team, they will be resolved before synthesis is complete. In the final stage, comments are collected from our international advisory board for this project, comprising external substantive and methodological experts, and stakeholders.

Deliverables

This review will have four key deliverables:

- A living library of key literature
- An evidence gap map
- An interactive evidence toolkit
- Publications and conference presentations

Firstly, a living library of key literature in teacher education will be created using the EPPI Visualiser database. This living library will hold all evidence synthesis papers that the research team finds on this topic. An example of such a database can be found here. The living library will be updated periodically for a year by the research team, and beyond that for as long as funding allows.

A living evidence gap map will be created using EPPI Mapper software, an interactive tool that can help researchers to review existing evidence on teacher education and identify gaps in the evidence where more research is necessary. See here for an example of an evidence gap map.

There are plans for an interactive evidence toolkit, hosted online. The specification of the toolkit will be clarified once the research team understands more about evidence-informed practice and after consulting with the NIoT's programmes team concerning the needs of the sector and the team. It is likely to include multimedia resources for teachers and teacher educators to use, such as infographics, videos, interviews, and podcasts. This deliverable is planned for the second year of the project, in 2025.

Finally, the research team will disseminate findings via publications in high-impact journals and presentations in teacher-facing and research-facing conferences.

Personnel

The project (meta-review and toolkit production) will be conducted by the Evidence Synthesis team at the NIoT: Dr Melissa Bond, Dr Violeta Negrea, Dr Evie Smith, Dr Bronte Mckeown, and Mr Shaun Dillon, and co-led by Prof Sin Wang Chong and Dr Emily Oxley.

Additionally, a multi-media designer will aid in the creation of the living toolkit during the second year of the project (2025), while the marketing and communications team will incorporate the living library, evidence gap maps, and the toolkit into the NIoT's website infrastructure.

Finally, the project will require a global advisory board, to complete the final stage of the six-stage review process (Chong et al., 2022). Along with wider team members from the NIoT, the advisory board will advise on translating evidence, considering the impact of the research globally, and ensuring advice reaches practitioners. Below are members of our international advisory board:

- Dr Nina Bergdahl, Halmstad University; Stockholm University, Sweden
- Professor David Boud, Deakin University, Australia
- Professor Stephen Gorard, Durham University, England
- Dr Shannon Mason, Nagasaki University, Japan
- Dr Elaine Munthe, University of Stavanger, Norway
- Dr Tom Perry, University of Warwick, England
- Dr Lisa Reed, University of Dundee, Scotland
- Associate Professor Rita Silver, Nanyang Technological University, Singapore
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Conflicts of interest

We may review evidence that has been produced by the NIoT. To ensure no organisational bias within the report, we will ensure our international advisory board review our deliverables thoroughly.

Timeline

Start	**Activity**
September 2023	Production of protocol
October – November 2023	Scoping work using the search string to determine the period of publication to focus on
December 2023	Revise protocol based on feedback
January 2024	Publication of protocol Initial approach to advisory board invitees
February 2024	Set up EPPI Reviewer for the project Searching and importing of relevant reviews into EPPI Reviewer
March 2024	Screening
April – July 2024	Data extraction
August 2024	Data synthesis
– September 2024	Production of evidence gap map and write up final report
October 2024	Submit gap map and report to advisory group (Deliverables 1 and 2)
November 2024	Finalise gap map and final report based on feedback, ready for publication. (Deliverable 3)
December 2024	Plan for the toolkit component of the project and monthly living updates to the review
2025 onwards	Toolkit development and launch and ongoing update of living library according to funding (Deliverable 4).

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Appendix A: Data extraction tool

- Publication details
  - Publication type
  - Publication date
  - Publication name
  - Open access status
- Author information
  - Number of authors
  - Discipline of first author
  - Country of author affiliations
  - Continent affiliation
  - Type of collaboration
  - Author affiliation
- Review type
- Geographical focus of the review
- Focus of the review (topic in teacher education)
- Educational context searched for
- Participant focus/setting
  - ITE – undergraduate
  - ITE – postgraduate
  - CPD – primary school teachers
  - CPD – secondary school teachers
- Methodological questions
  - Databases used in the review
  - Resources included in the review
  - Technology used to conduct review
- Quality assessment
- Key findings