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Research project paper 2

Using meta-analysis to explore the transferability of education mid-range theories to Cameroon, Chad, Nigeria and Niger: Final academic report – Evidence synthesis

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About this research project paper

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Centre of Excellence for Development Impact and Learning

CEDIL project S.144: Final academic report – Evidence synthesis

Project title: Using meta-analysis to explore the transferability of education mid-range theories to Cameroon, Chad, Nigeria and Niger

Lead organisation: Education Endowment Foundation (EEF), Effective Basic Services Africa, (eBASE)

Principal investigators: Professor Steve Higgins, Dr Emma Dobson, Jonathan Kay, Patrick Okwen

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Abstract

This project sought to recontextualise a popular evidence portal from the English education system to Cameroon, Chad, Niger and Nigeria. The Teaching and Learning Toolkit is a resource that summarises the global evidence for 30 different pedagogical approaches in plain language so that it can inform the decisions of school leaders in England.

In order to recontextualise the Toolkit, stakeholders were engaged to assess the applicability of each approach in the Toolkit to the context of the Chad Basin. Where strategies were considered unfeasible, they were removed from the portal. Strategies selected for inclusion were updated through local evidence searches and a review of wider development evidence. Three new systematic reviews were completed to add topic areas that were considered important in the Chad Basin, but currently not included in the portal (menstrual hygiene management, cash transfers, corporal punishment).

The recontexualisation process, described above, revealed disparities between the extent that pedagogical approaches have been evaluated in low and middle income countries. While messages from the global evidence base seem to resonate with stakeholders and are considered applicable and feasible in the context of the Chad Basin, very little research has sought to evaluate attainment outcomes or to examine pedagogical approaches such as feedback or metacognition.

Several topics were removed from the evidence portal on the basis of stakeholder engagement (one-to-one tuition, teaching assistants, learning styles, school uniform and setting and streaming). The new topics of menstrual hygiene and cash transfers were added to the portal, with reviews identifying a small positive effect on attainment from cash transfers, but being unable to identify enough studies to meta-analyse for an attainment outcome of menstrual hygiene interventions. The review of corporal punishment identified that no rigorous studies had been conducted. All of the results have been communicated in an accessible and transparent way for the benefit of policymakers and practitioners in the Chad Basin.

1. Introduction

Description of the project

The Teaching and Learning Toolkit is an evidence portal that summarises the global evidence for educational strategies and communicates them in an accessible format with teachers, school leaders and policymakers.

In England the Toolkit is widely accessed when making decisions on how to spend school funding, with recent survey data showing 69% of school leaders access the resource.[1] The popularity of the resource has led to it being adopted by a number of other educational systems. The Education Endowment Foundation (EEF) has formed international partnerships in Australia, Jordan, Spain and across South America (through a regional partnership with Laboratorio de Investigación e Innovación en Educación para America Laina y el Caribe (SUMMA) – the Knowledge and Innovation Exchange Hub (KIX) for Latin America and the Caribbean). In these contexts, the Toolkit is translated into the local language (where applicable) and the global evidence is supplemented with searches of local evidence that contain details of relevant considerations for recontextualization, as well as flagging gaps and risks from the global evidence base.
The aim of this project was to support the translation and recontextualization of the Toolkit to the Chad Basin. Given the contextual differences between the Chad Basin and the English education system, this project aimed to explore the transferability of the resource and the underlying topics to the target countries. By transferability, we meant both whether the resource itself was usable, and whether the impacts for the approaches themselves were likely to be replicated in the target settings.

The topics that are meta-analysed in the Toolkit are not programmes, but instead focus on broader topic areas identified through engagement with practitioners (Higgins, et al., 2016). The project hypothesised that this focus on more general pedagogical theories such as metacognition or feedback might mean that topic areas might represent mid-level theories and thus be more transferable than programme specific meta-analyses.

Objectives of the project

The project had three distinct aims:

1. **To assess the transferability of different pedagogical approaches to the Chad Basin (Cameroon, Chad, Nigeria and Niger)**
2. **To compare the prevalence of evidence around pedagogical strategies between high income and low and middle income countries**
3. **To produce an appropriately translated evidence portal for education stakeholders within the Chad Basin.**

Within these objectives a number of distinct aims and activities took place including extensive stakeholder engagement both during the creation of the evidence portal and the appropriate dissemination of the eventual resource.

[1] https://www.suttontrust.com/our-research/school-funding-and-pupil-premium-2022/

Contribution to the literature

This project contributes to the literature with three new distinct evidence reviews. While cash transfers and menstrual hygiene interventions have been systematically reviewed in the past, few reviews have focused primarily on attainment outcomes. The evidence review on corporal punishment represents an area in which very little rigorous evidence synthesis has taken place. Mapping the extent of the evidence helps gain an insight into the extent of the evidence for this practice.

The primary contribution to the literature is the building of a coherent underlying evidence infrastructure that extracts information studies across many different contexts across the world and allows them to be compared within the same dataset (see 'Innovation and relevance to CEDIL').

Policy relevance

The final product is the first evidence portal with meta-analytic results directed at policymakers within the Chad Basin. It allows policymakers to see the key findings very quickly from the global evidence base, key considerations to implementing approaches within the local context and limitations in the evidence base that might require more extensive evidence generation.

The portal has been developed in consultation with policy stakeholders and is directly targeted at a policy audience, written in plain-language and available in both French and English.

Innovation and relevance to CEDIL

The project was innovative in providing (to the authors' knowledge) the first accessible evidence portals to provides comparable meta-analytic findings across a number of different topic areas to policymakers in the Chad Basin.

The key methodological innovation of the project is consolidating a global evidence base into a shared dataset that does not silo studies from high income countries from studies that take place in low- and middle-income countries (LMICs). Evidence databases and portals have previously either tended to focus exclusively on one country (for example, the What Works Clearinghouse evidence summaries based in the USA) or to focus on a development context (for example the 3ie development evidence portal). While each of these resources are incredibly useful for decision makers, they do not allow any comparison of impact between different contexts. This is particularly important in the field of education, where many pedagogical theories are based on the interaction between teacher and pupil and therefore may be resilient to potential contextual barriers to transferability.

Creating a central database that includes academic studies from all contexts allows us to compare impact between context to verify whether pedagogical theories are transferable. It also allows us to make comparisons about the extent of evidence in each context – for example identifying approaches that have been extensively tested in a high income context but rarely evaluated in development contexts. These findings may

create a useful comparison point for motivating future research overall and offer insights into best bets for strategies when selecting approaches to trial in the Chad Basin.

2. Methodology

The project can be broken into four distinct research activities that together aim to recontextualise the Teaching and Learning Toolkit:

I. **Stakeholder engagement on the relevance and applicability of approaches**
II. **Mapping the prevalence of studies from different countries currently included in the Teaching and Learning Toolkit and other portals.**
III. **Local searches of the evidence for all 27 topics included in the final evidence portal**
IV. **Systematic reviews for three new topic areas (cash transfers, menstrual hygiene interventions, corporal punishment)**

For readability the methodology and results of each activity has been grouped together. The conclusions section discusses of the activities taken together (the overall findings around context and the transferability of the mid-range theories).

Activity I: Stakeholder engagement

In order to test the transferability of the Toolkit, engagement with stakeholders has been fundamental. While stakeholder engagement will be crucial in the dissemination strategy of the evidence portal, the first stakeholder engagement was used to collect information on the appetite and feasibility for the topics in the current Teaching and Learning Toolkit (the full list of topics can be found here).

Relevant stakeholders

The first step of stakeholder engagement was mapping the relevant stakeholders in the Chad Basin. In order to have a positive impact on pupil outcomes, the most important lever is the teachers that interact directly with pupils. The relevant stakeholders, therefore, would have an influence on teacher behaviour change. While many contexts that utilise the Teaching and Learning Toolkit have relatively autonomous education systems (e.g. England), in the context of the Chad Basin the education systems have far greater policy influence over teacher behaviour. We, therefore, ensured that policy voices were prioritised during stakeholder engagement. Table 1 maps the stakeholders by power and interest.

Table 1
Stakeholder mapping

Power	**High**	• **Department of cooperation at the ministries of basic and secondary education in Cameroon** • **Ministère de L'Education Secondaires (Cameroun)** • **Parliament (all)**	• **Ministère de L'Education de Base (Cameroun, Niger, and Chad)** • **Ministère de L'Education Secondaires (Chad and Niger)** • **Prime Minister's Office**

		• Senate (Cameroon and Nigeria) • Micro-finance institutions • Banks • Ministry of Social Affairs (Cameroon, Niger, Chad) • Traditional Leaders • British High Commission (Cameroon)	• Development Agencies (UN Women, UNICEF, World Bank, UNESCO) • National and regional pedagogy inspectors (both basic and secondary education) • Academia • State Ministry of education (Nigeria) • Africa Evidence Network (AEN), Effective Basic Services (eBASE) Africa • Centre for the Development of Best Practices in Health (CDBPS) • Media: Cameroon Radio Television (CRTV), print press • HP Foundation (Niger and Nigeria) • Africa Institute for Development Policy (AFIDEP) (Niger, Nigeria, and Cameroon)
	Low	• Informal sector learning structures • Schools in conflict regions	• Teachers (private and public schools; primary and secondary schools; TVET and general education; formal sector education • Mbororo Social and Cultural Development Association of Cameroon (MBOSCUDA) (indigenous group advocacy CSO) • Centre for Advocacy in Gender Equality and Action for Development (CAGEAD) (CSO) • Local farmers and women's groups
		Low	High
		Interest	

Two working groups were formed for ongoing consultation – one on the opinions of practitioners who would ultimately be utilising the evidence at the final stage of the theory of change, and a second policymakers working group that included the organisations that had high interest and influence. A full table of stakeholder engagement can be found in Annex B.

Given the innovative nature of the project a wide range of stakeholders, apart from policymakers and teachers, were also consulted for feedback, including parents, students, academics, and civil society organisations.

Academics and researchers were consulted to identify priority areas for research and identify which topic areas had gaps. Extensive engagement took place with teachers and policymakers to gather feedback on relevance of existing strands in the Toolkit, and their preferences for new strands for inclusion in the Toolkit. These sessions were also very helpful in informing the dissemination strategy of the evidence portal.

Teachers, parents, and students were consulted to find out some of the conditions for learning that were required for implementing some of the strategies in the Toolkit. This not only helped the process of mapping the transferability of the topics included in the evidence portal, but also supported the development of supporting resources that examine interventions that can support the development of "conditions for learning".

Relevance of existing topic areas

Each of the 30 existing topic areas was discussed in stakeholder engagement sessions. Stakeholders were asked to assess:

- **Is the approach relavant and feasible in the target countries of Chad, Cameroon, Nigeria and Niger?**
- **Is there appetite for the approach?**
- **Are there any other barriers to consider when implementing the approach?**

Of the 30 topics, most were considered both feasible and desirable to implement in the context. There were, however, 5 topics that were identified as not being transferable.

- **One to one tuition – while the theory of change for intensive support delivered on a one-to-one basis did seem transferable to the context, teachers highlighted that it was not currently feasible in the school systems in the Chad Basin. The cost of the approach was a severe barrier to implementation. A decision was therefore made to include the less expensive "Small group tuition" topic area but not "One to one tuition"**
- **School uniform – this topic area was included in the English Toolkit to support a more evidence-based conversation around the idea that introducing uniform policy might improve pupil outcomes. Given the expense of uniform and the fact that this conversation is not prevalent in education settings in the Chad Basin, stakeholders suggested it should be removed.**
- **Setting and streaming – stakeholders were concerned that the practices of setting and streaming as described in the Toolkit were not feasible, and the evidence summary might be conflated with Teaching at the Right Level, which alongside grouping by ability comprises additional teaching components that mean that it is non-comparable to the wider evidence base around setting and streaming.**
- **Teaching assistants' interventions – teaching assistants are infrequently employed by the settings in the target countries, this evidence base was therefore deemed non-transferable and irrelevant.**

- **Learning styles – while the education myth around learning styles is prevalent in the English school system, there was little use or reference to learning styles in the education systems in target countries. It was, therefore, not deemed relevant by stakeholders.**

New topic areas of interest

Stakeholders were also asked whether there were any topic areas that were relevant but not currently included in the Teaching and Learning Toolkit.

In both consultations with teachers and policymakers, there was a consistent desire to include information on cash transfers and menstrual hygiene interventions. These topics were frequently cited as interventions considered by policymakers to improve educational outcomes.

The other topic area that was frequently discussed was the use of corporal punishment as a behaviour management approach. While stakeholders did not see the approach as a desirable intervention, policymakers requested better evidence so that they could advocate for other interventions.

Following these stakeholder consultations, we agreed to create two new topic areas within the evidence portal – menstrual hygiene interventions and cash transfers. We also agreed to conduct a systematic review on corporal punishment interventions, but that this would be included in the wider evidence summary of behaviour interventions.

In later stakeholder consultation, the impact of Covid-19 meant that there was demand for more information on distance learning approaches. Unfortunately adding an additional systematic review to the project was not feasible at that stage. The team involved in the project, however, did conduct a rapid evidence assessment on distance learning approaches overall, and a short document that discussed the transferability of these findings to LMICs, which was externally funded by EdTech Hub and can be found here.

Activity II: Mapping the prevalence of studies from different countries currently included in the Teaching and Learning Toolkit

In addition to examining the transferability of approaches through stakeholder engagement, we explored the current evidence base for the topic areas of the Toolkit and the geographical distribution of studies.

We first explored the frequency of studies from LMICs in the database for the Teaching and Learning Toolkit. We then examined the 3ie evidence repository to identify areas where relevant studies may have been missed. The mapping of the EEF Toolkit and 3ie repository revealed that, in contrast to studies in high income countries, studies in low and middle-income countries are much more likely to focus on policy levers (e.g. performance pay) than pedagogical strategies.

The Teaching and Learning Toolkit

The Toolkit was created by collating effect sizes from existing meta-analyses of studies that could be included under the different strands. Due to uncertainty about the relevance and applicability of the studies contained within these meta-analyses, the EEF Database Project 'unzipped' relevant meta-analyses and reviews, identifying and re-analysing the individual studies used to create reported averages to produce a more accurate estimate of effect for 32 strands.

The EEF Database contains the individual studies used to calculate the scores presented in the Toolkit. 10,474 studies are held within the database, with 2,531 of these records being used to calculate an effect for the Toolkit. Studies used to generate effect estimates presented within the Toolkit must meet the inclusion criteria outlined below in Table 2.

The inclusion criteria for the Toolkit were decided based on the organisational focus of the EEF (increasing attainment of disadvantaged pupils aged 3-18). The methodological inclusion criteria of requiring a counterfactual comparison is to ensure that impacts are comparable. Studies that focus on outcomes before and after an intervention with no counterfactual are not a valid measure of efficacy in education, due to the progress pupils make as they move through school (whether an intervention is introduced or not). The decision to only include English language studies was a restriction due to the research team. The EEF is working with a network of other organisations to build multi-lingual capacity to update the research in future.

Table 2:
Inclusion criteria for studies included in Toolkit

Inclusion criteria	Excluded
The majority of the sample (>50%) on which the analysis is based are learners or pupils aged between 3-18 (further education or junior college students are be included where their study is for school level qualifications).	The majority of the sample are: post-secondary education; in higher education; adults; infants under 3; other students over 18.
The intervention or approach is undertaken in a normal educational setting or environment for the learners involved, such as a nursery or school or a typical setting (e.g. an outdoor field centre or museum).	Laboratory studies Specially created environments (both physical and virtual) designed for theoretical research questions, rather than educational benefit.
A valid counterfactual comparison between those receiving the educational intervention or approach and those not receiving it.	Single group and single subject designs where there is no control for maturation or growth.
Assessment of educational or cognitive achievement which reports quantitative results from testing of attainment or learning outcomes such as by standardised tests or other appropriate curriculum assessments or school examinations or appropriate cognitive measures.	Attitudinal, affective or motivational outcomes.
A quantitative estimate of the impact of the intervention or approach on the educational attainment of the sample involved in the intervention or approach can be calculated or estimated in the form of an effect size (standardised mean difference) with its standard error based on a counterfactual comparison.	Purely qualitative outcomes Studies where an effect size (standardised mean difference) and standard error cannot be identified, calculated or estimated with reasonable precision.
Studies from any country or region that have been translated into English.	No exclusions on the basis of region. Studies that are not available in English for data extraction may be excluded.

Once a study has been deemed suitable for inclusion, it is passed to a team of coders who record study characteristics (setting, population etc.), intervention design (participant allocation, blinding etc.), and relevant attainment outcomes. Coding for the country in which the study was conducted enables exploration of the extent to which the Toolkit draws on research from LMICs.

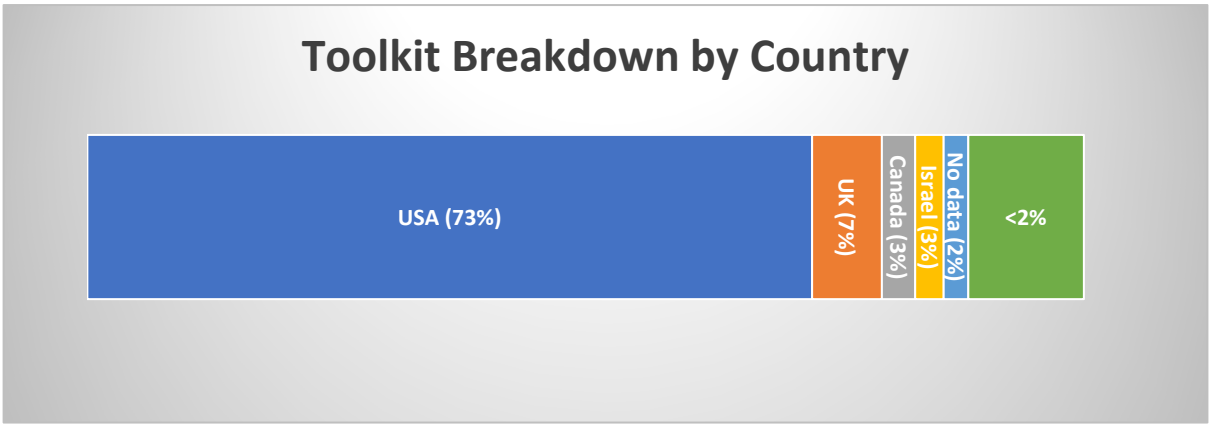
All coding activities were carried out by a team of reviewers, each working independently but discussing and resolving queries, and when necessary, eliciting a third opinion from the core project team. All coders received training and had to achieve an agreed level of reliability to be included in the coding team. A 10% sample of studies (per coder and per strand) are double coded to ensure reliability.

Characteristics of studies included in the Toolkit

Country

Research studies from 53 countries make up the 2,531 studies included in the Toolkit. The biggest contributors are the USA (n=1840, 72.71%), followed by the UK (n=178, 7%), Canada (n=84, 3%) and Israel (n=73, 3%).

Figure 1
Visual representation of Toolkit studies' country of conduct as a percentage



Region

The World Bank classification system was used to group countries by geographic region (Table 3). Of the 2,531 studies included in the Toolkit, the biggest contributors are North America (n=1924, 76%) and Europe & Central Asia (n=349, 14%).

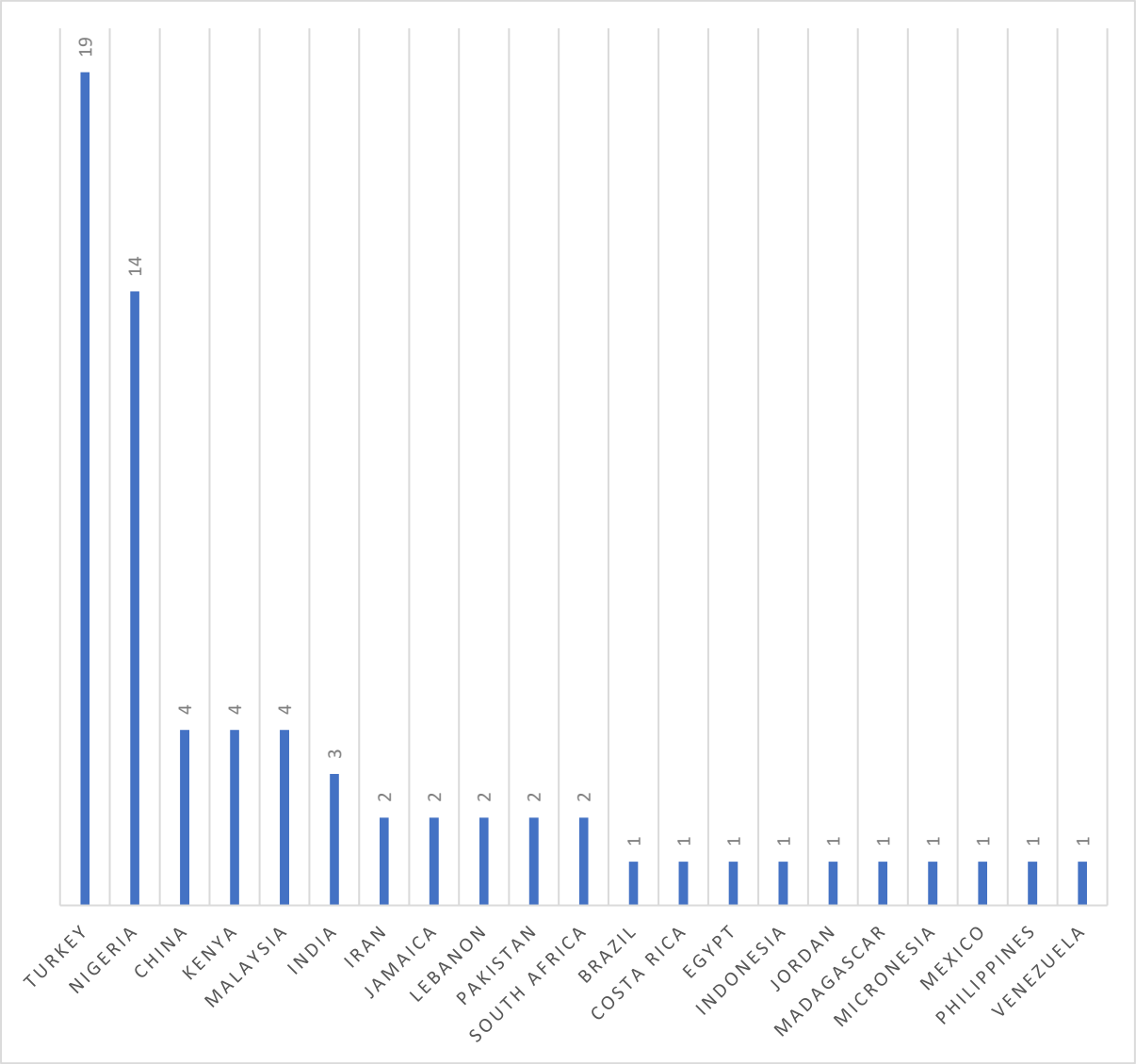
Table 3
Toolkit studies and geographic region

Region	Included (N)	Toolkit (%)
North America	1924	76%
Europe & Central Asia	349	14%
East Asia & Pacific	83	3%
Middle East & North Africa	82	3%
Sub-Saharan Africa	21	1%
Latin America & Caribbean	9	<1%
South Asia	5	<1%
No code	62	2%

Context

The World Bank classification system was used to group countries by income. High Income Countries (HICs) make up 95% (n=2405) of the Toolkit (2% not coded, n=62).
Of the 2,531 studies included in the Toolkit, LMIC countries are the setting for 3% (n=68) of included research evidence. Within this grouping, the most prevalent countries are Turkey (n=19) and Nigeria (n=14), which account for just under half of all LMIC literature (49%). It is important to note that these numbers do not represent single studies. Some of the studies within the EEF Database have been duplicated to record multiple treatment conditions or different population outcomes presented in one report.

Figure 2: LMIC frequencies in Toolkit



Over 80% of included LMIC studies were conducted post-2000 (pre-2000 n=20, post-2000 n=58). Over half (n=51, 65%) of included LMIC studies present research findings for secondary age students (using UK age boundaries), with 30% presenting research findings for primary age students (n=24). 2 studies included outcomes for students over the age of 16.

An additional 6 LMIC studies are recorded within the EEF database that have been excluded from the Toolkit. Most commonly, studies were excluded because they did not measure attainment outcomes or contain enough outcome data to calculate an effect size estimate (n=5).

This appears to be a common feature of excluded studies in other reviews of LMIC literature (Snilstveit, 2016; Baird, 2013). This is unsurprising, given that the educational context and therefore aspirations of LMIC studies are very different to HIC counterparts. The review of research evidence for cash transfers and menstrual hygiene interventions being conducted in collaboration with eBASE for example, highlights that the majority of educational interventions conducted in LMIC settings aim to increase health and social outcomes alongside those that are more educational in nature such as increased

rates of attendance, enrollment, and grade progression. As a result, there is less measurement and reporting of attainment. This is not to argue that increases in attainment are not of importance to practitioners and researchers working in these settings, but rather that recent social upheaval in LMIC countries such as Niger, Nigeria, Cameroon and Chad due to migration, refugee settlement, conflict, and terrorism has led to significant disruption in schooling. This exacerbates existing educational issues such as a lack of appropriate resources and materials for teaching, loss of students to the workforce to supplement household income, and social stigma leading to the educational exclusion of specific groups e.g. girls, minority populations. Consequently, practitioners' focus is on identifying methods to secure attendance, rather than trialing approaches to improve attainment. As such, it may be difficult to find LMIC research that 'fits' the reporting of the Toolkit in its current form.

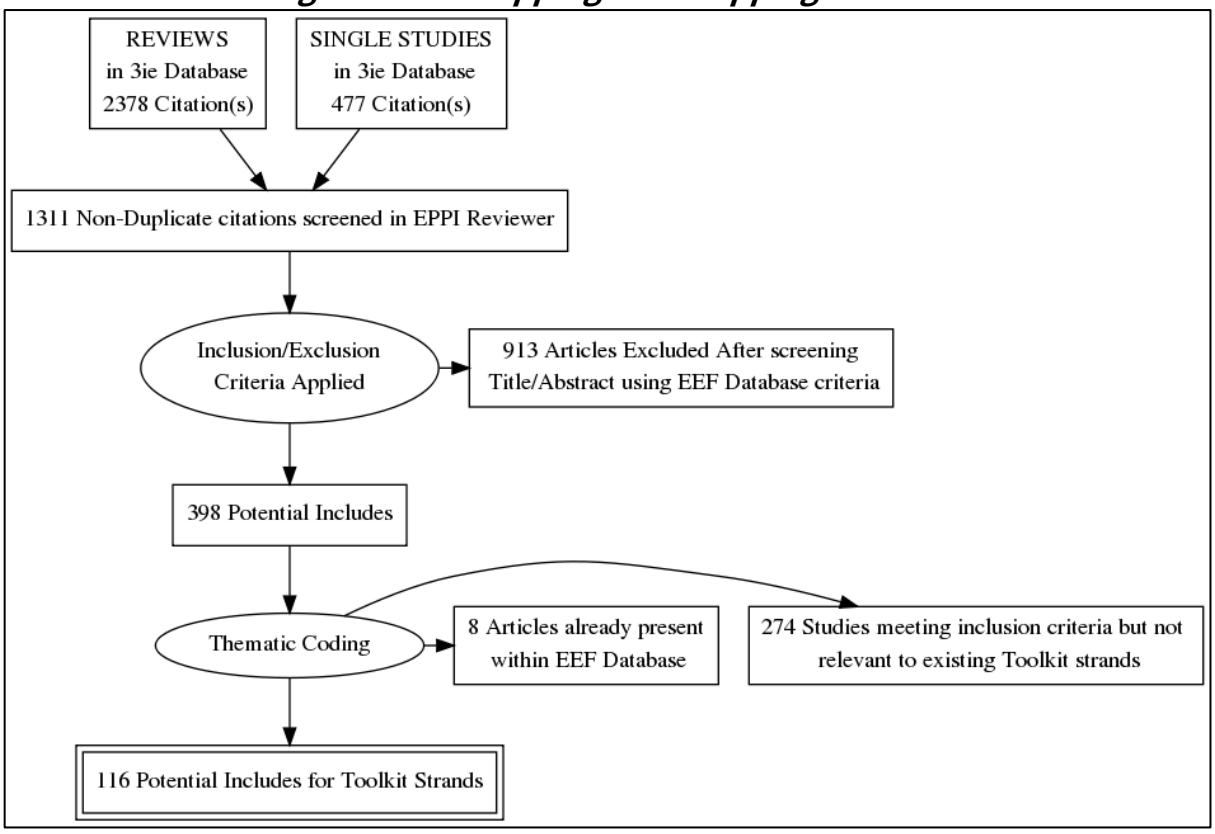
The 3ie Development Portal

The 3ie Development Portal provides a comprehensive overview of studies conducted in a development context. The portal covers a number of topics outside the scope of the Teaching and Learning Toolkit, but includes a studies of education. Given the portal has been created using systematic searches of over thirty sources and academic teams have screened over 150,000 references, it is a useful source for identifying studies that have not been identified through the searches that populate the Teaching and Learning Toolkit.

To map the studies within the database and assess their relevance for the EEF Toolkit, it was necessary to export citations from the 3ie Database to EPPI Reviewer. This will support coding and synthesis of the research held within the 3ie Database. Once a citation has been uploaded to EPPI Reviewer it is possible for coders to identify common research themes, record study characteristics (setting, population etc.), assess intervention design (participant allocation, blinding etc.), and classify risk of bias using the Cochrane Assessment Tool and measure/combine relevant outcomes across themes.

1,311 citations are held within the EPPI review of the 3ie Database. These have been taken from individual impact studies and studies reported within reviews in the 3ie Database. Once citations had been uploaded to EPPI Reviewer, their suitability for inclusion in the EEF Toolkit was assessed by applying the same inclusion criteria used in the EEF Database to titles and abstracts. To be identified as potentially relevant for inclusion in the Toolkit, a study had to report the results of an experiment investigating the efficacy of a technique relevant to a Toolkit strand by measuring educational outcomes for students (3-18) in educational settings. After applying this criteria, 130 studies were identified as potential includes for the Toolkit (some of these studies appear relevant for multiple strands, giving 140 potential includes overall).

Figure 3:
Inclusion flow diagram for unzipping and mapping the 3ie database



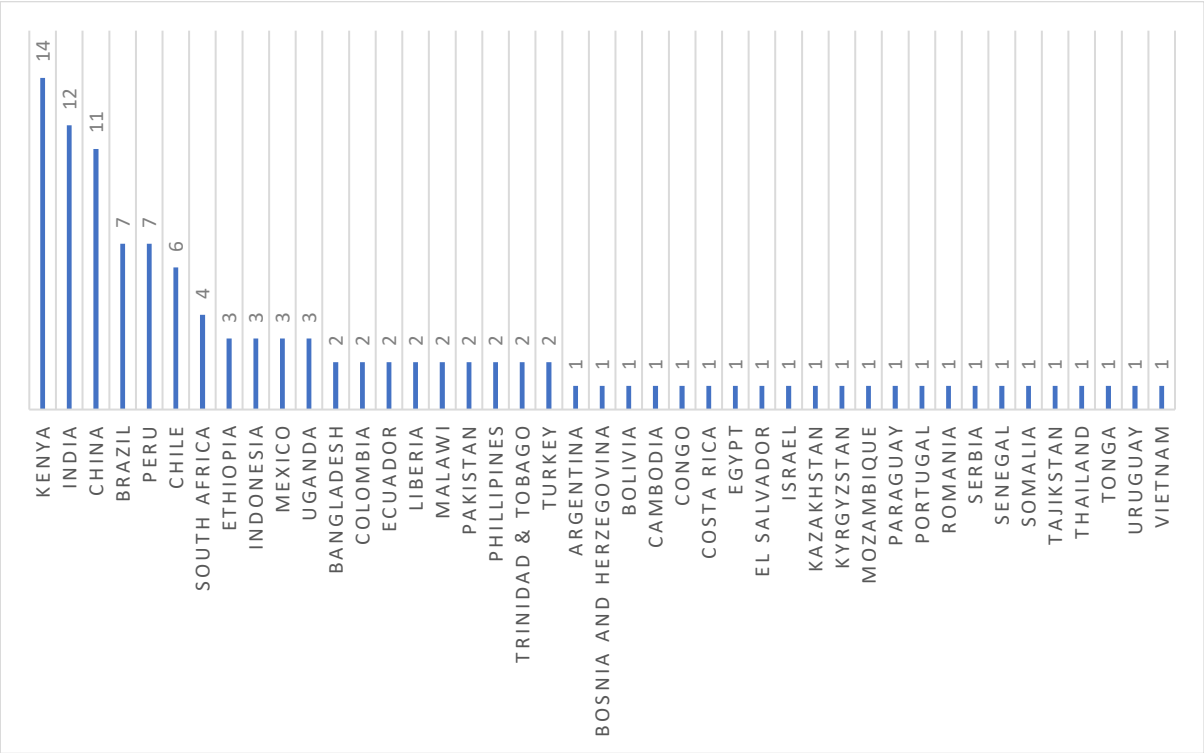
Characteristics of Toolkit-relevant studies in 3ie Database

Country

3ie Database studies identified as potentially relevant for the Toolkit span 43 different countries. The biggest contributor is Kenya (n=14, 12%), followed by India (n=12, 11%), China (n=11, 10%), Brazil (n=7, 6%), Peru (n=7, 6%) and Chile (n=6, 5%).

Figure 4
Visual representation of 3ie Potential Includes (PIs) country of conduct as a percentage

Figure 5
Frequencies of 3ie Potential Includes (PIs) country of conduct



Region

The World Bank classification system was used to group countries by geographic region (Table 4). Of the 116 studies identified as potentially relevant for the Toolkit, the most common regional settings for 3ie studies identified as potentially relevant for the Toolkit are Latin America and the Caribbean (n=31, 27%), Sub-Saharan Africa (n=30, 26%), East Asia & Pacific (n=20, 17%) and South Asia (n=16, 14%). Currently, Latin America and the Caribbean, Sub-Saharan Africa, and South Asia account for the lowest percentage of studies in the Toolkit.

Table 4
3ie Potential Includes and geographic region

Region	Included (N)	3ie (%)
Latin America & Caribbean	31	27%
Sub-Saharan Africa	30	26%
East Asia & Pacific	20	17%
South Asia	16	14%
Europe & Central Asia	10	9%
North America	3	3%
Middle East & North Africa	2	2%

No data	**4**	**3%**

Participant characteristics (school stage)

Whilst over half of the LMIC evidence in the Toolkit is based on studies of secondary school aged students (n=51, 66%), 3ie database Potential Includes were more likely to focus on primary school-aged children (n=35, 44%) or the early years (n=30, 38%), with less than 20% focusing on secondary school aged students (n=15, 19%). This is based on information available in the title and abstract, from which it was possible to identify participant characteristics from 80 studies (it was not possible to obtain this information for 36 studies without screening the full text).

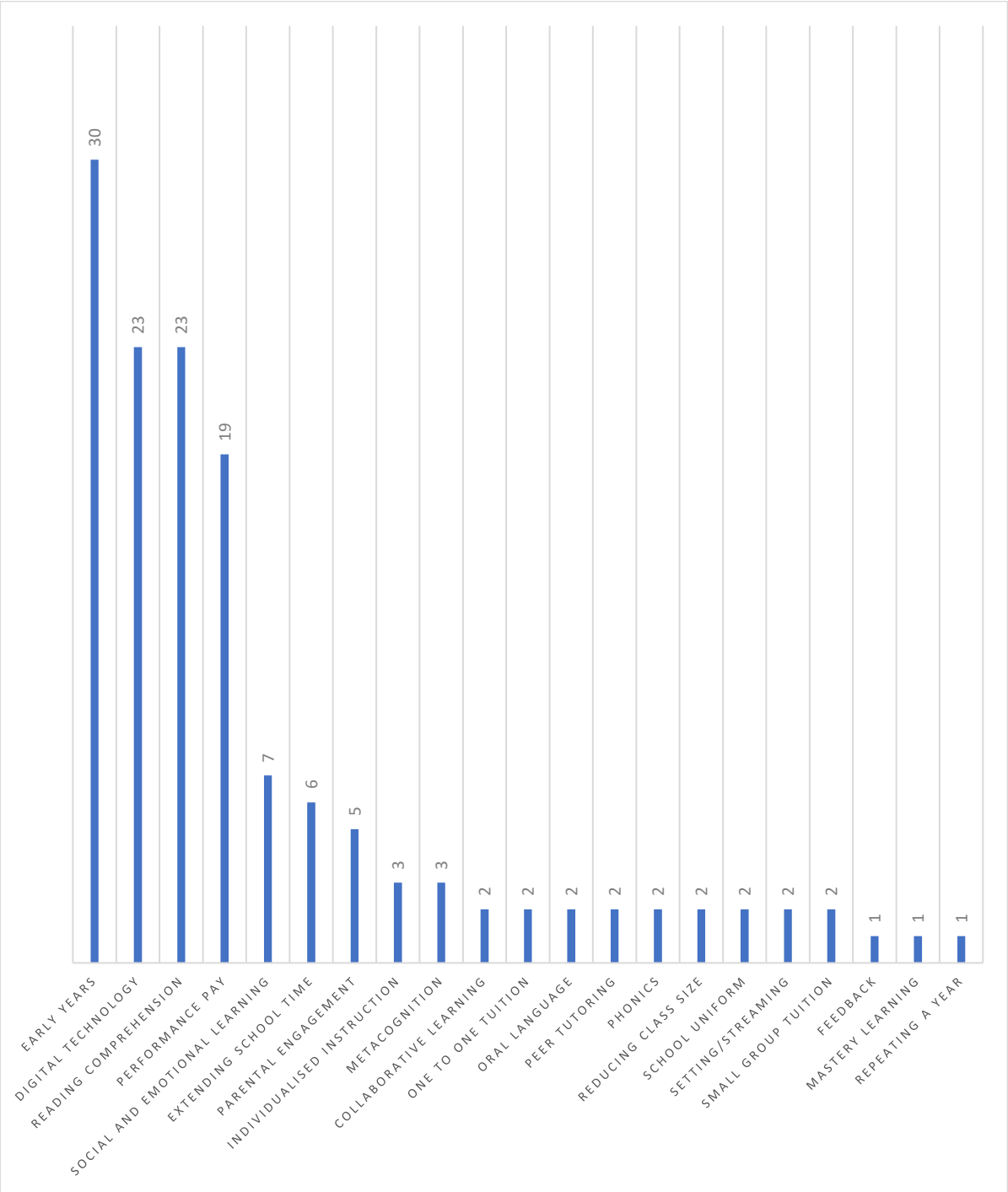
Table 5
3ie Potential Includes and participant characteristics (school stage)

Participant school stage	Included (N)	3ie (%)
Early Years	**30**	**27%**
Primary School	**35**	**26%**
Secondary School	**15**	**17%**
Post-16	**10**	**14%**

Alignment with Toolkit Themes

The 140 potentially relevant studies identified within the 3ie Database span 19 strands: with most studies reporting on Reading Comprehension (n=23) and Performance Pay (n=19). In addition, 2 previous strands were found to be a common focus of 3ie PIs: Digital Technology (n=25) and Early Years (n=25).

Figure 6
Frequencies of 3ie Potential Includes (PIs) mapped to Toolkit strands



Strand prevalence within the 3ie Database does not appear to reflect the general trend of LMIC study focus within the EEF Database, where the strands with the largest number of LMIC studies were Collaborative Learning, Individualised Instruction, Metacognition and Self-Regulation, and Arts Participation. Nor does it reflect the strands with the largest number of overall studies within the Toolkit (Metacognition and Self-Regulation, Collaborative Learning, Individualised Instruction and Feedback).

12 strands were not identified as the focus of any of Potential Includes within the 3ie Database:

- **Arts participation**
- **Aspiration interventions**
- **Behaviour interventions**
- **Block scheduling**
- **Homework**
- **Learning Styles**
- **Mentoring**
- **Outdoor adventure learning**
- **Sports participation**
- **Summer schools**
- **Teaching assistants**
- **Within-class attainment grouping**

Presence within Toolkit

After identifying studies which may be relevant to the Toolkit (n=124), these references were cross-referenced with the EEF Database to evaluate the extent to which the existing EEF Database currently captures this research. To be marked as present within the EEF Database, a study had to appear in the strand directory that best matched its description. For example, to be marked as present within the EEF database, a performance pay study identified via the 3ie Database has to be present within the 'Performance Pay' directory, (even if it has been identified elsewhere in other strands).

Following this approach, 8 of the 124 identified studies from the 3ie Database are marked as present in the 'correct' strands in the EEF Database, leaving 116 new studies not currently included in the database that could be screened and added to support existing strands.

Discussion

The mapping of the 3ie database and the geographic distribution provides several useful findings. The first is that there are clear gaps in the Teaching and Learning Toolkit, which have been supplemented with the comprehensive search strategy for the 3ie evidence portal. Including studies from the 3ie database expands the geographic spread of the resource and is likely to increase the relevance of the resource to regions like the Chad Basin.

More importantly, mapping the two databases together reveals the large disparity in research between LMICs and countries commonly classified as high income. Figure 7 shows the disparity within each topic area of the Toolkit when both 3ie and EEF identified studies are included.

For some of these topic areas, the limited number of studies may be due to a limited relevance or barriers of transferability to LMIC. For example, our stakeholder engagement identified Teaching Assistants as being uncommon and not possible to implement in their settings.

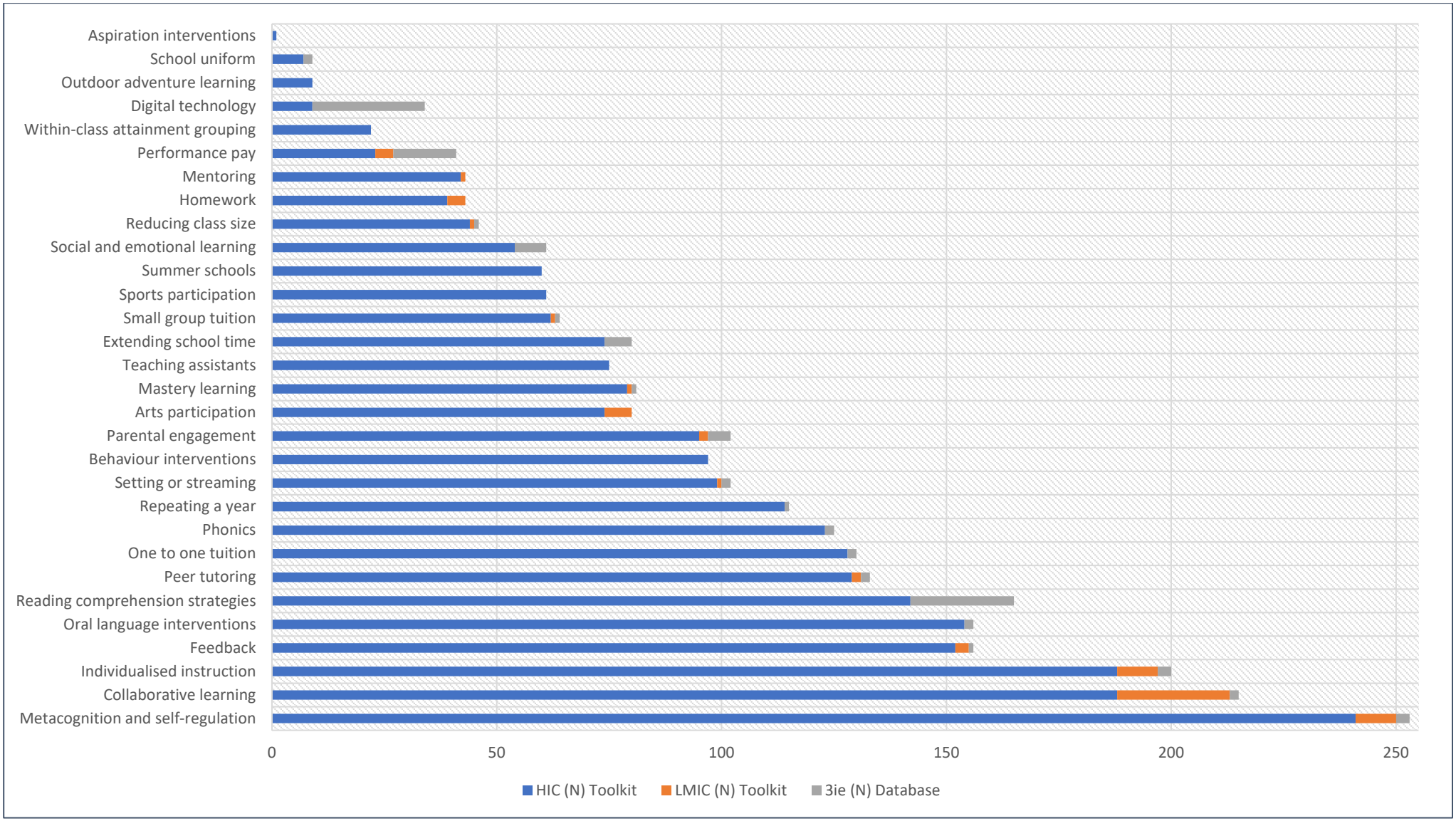
Other topic areas, however, are identified as of high relevance to policymakers and teachers in the Chad Basin. There are clear research disparities for a number of relevant pedagogical mid-range theories.

There implications for policymakers and researchers are clear. Topics with a high impact and extensive evidence base globally have not been researched extensively in LMICs – for example feedback, meta-cognition and mastery learning. If these approaches represent transferable mid-range theories, then they may have the potential to increase academic outcomes. Further research should be directed to fill gaps in the evidence base and test whether the promise from other countries can be replicated.

The lack of crossover between the 3ie and EEF databases shows the value of information sharing between global research organisations. A combined dataset between multiple evidence synthesis organisations could protect against missing studies and allow for rapid evidence synthesis across a large variety of topics of interest to practitioners and policymakers.

Figure 7

Frequency of HIC and LMIC studies in Toolkit strands with the addition of literature identified within the 3ie Database



Activity III: Local evidence searches

Given the limited number of studies that met the inclusion criteria for the meta-analysis in the Toolkit from the target countries, it was important to examine the wider literature to contextualise findings for the Chad Basin.

For each of the topics within the Toolkit a rapid evidence search was conducted to identify studies that provided useful data on considerations for implementation in the context.

The aim of these searches was not to measure impact, and the searches were not comprehensive. The inclusion criteria for the meta-analysis required studies to include a comparison group. These searches, by contrast would allow for qualitative studies with no measure of impact to be included.

The key inclusion criteria for studies during the local evidence searches was contextual relevance – with only studies focusing on the approach in Sub Saharan Africa eligible for inclusion. Example search terms and databases searched for the Feedback strand are shown in Box 1 below.

A full local evidence summary example is included in Annex C.

Box 1: Search terms and database search for Feedback local evidence

Search Terms

School feedback, Assessment for learning, individual feedback, collective feedback, communal feedback, assessment feedback, formative assessment, learner-centred pedagogy, corrective learning pedagogy, diagnostic feedback, constructive feedback, individual attention, formative pedagogy, classroom-based assessment, Sub Saharan Africa

Databases Searched

Google scholar, Google, Open Knowledge Repository, ResearchGate, Cambridge Core, ERIC, UNESCO, UNESCO-IICBA, 3ie Evidence Portal, EBSCO (BEL, Education Abstract, Education Administration Abstract), Tayor and Francis (Education Research Abstract), Hand Search

Local evidence summaries are included in every topic area of the recontextualised Toolkit. In many cases, even when relaxing the methodological inclusion criteria to include qualitative studies, the local summaries highlight evidence gaps and the need for further research to be conducted.

Activity IV: Systematic reviews for new topic areas

The outputs of *Activity I* was a request for additional topic areas within the evidence portal. The new areas that required systematic searches were: cash transfers, menstrual hygiene interventions and corporal punishment interventions. Cash transfer initiatives and menstrual hygiene interventions were proposed as new topics within the Teaching and Learning Toolkit, while corporal punishment was identified as a subset of the already existing *Behaviour Interventions* topic area that had not been picked up through the initial searches for studies within the global database of studies.

The methodology and results of each new topic area is detailed below.

Cash transfers

Selection criteria

To be included in this review, studies had to meet the definition of a cash transfer program as described by Jackson (2019): an intervention with the aim to improve children's learning through conditional or unconditional financial assistance being provided in the home. In addition, the same inclusion criteria as those included in the EEF Evidence Database were used to assess suitability for inclusion in the review. The EEF Evidence Database contains the individual studies used to calculate the effect size estimates for the 32 strands presented in the Toolkit. 10,474 studies are held within the database, with 2,531 of these records being used to calculate an effect for the Toolkit. Studies used to generate effect estimates presented within the Toolkit must meet the inclusion criteria outlined below in Table 6.

Table 6

Inclusion criteria for studies included in the EEF Evidence Database

Inclusion criteria	Excluded
The majority of the sample (>50%) on which the analysis is based are learners or pupils aged between 3-18 (further education or junior college students are be included where their study is for school level qualifications).	The majority of the sample are: post-secondary education; in higher education; adults; infants under 3; other students over 18.
The intervention or approach is undertaken in a normal educational setting or environment for the learners involved, such as a nursery or school or a typical setting (e.g. an outdoor field centre or museum).	Laboratory studies Specially created environments (both physical and virtual) designed for theoretical research questions, rather than educational benefit.
A valid counterfactual comparison between those receiving the educational intervention or approach and those not receiving it.	Single group and single subject designs where there is no control for maturation or growth.
Assessment of educational or cognitive achievement which reports quantitative results from testing of attainment or learning outcomes such as by standardised tests or other appropriate curriculum assessments or school examinations or appropriate cognitive measures.	Attitudinal, affective or motivational outcomes.
A quantitative estimate of the impact of the intervention or approach on the educational attainment of the sample involved in the intervention or approach can be calculated or estimated in the form of an effect size (standardised mean difference) with its standard error based on a counterfactual comparison.	Purely qualitative outcomes Studies where an effect size (standardised mean difference) and standard error cannot be identified, calculated or estimated with reasonable precision.
Studies from any country or region that have been translated into English.	No exclusions on the basis of region. Studies that are not available in English for data extraction may be excluded.

Given the lack of studies of educational attainment reported in previous reviews of cash transfer programs, it was decided that the criteria that a study had to report on attainment outcomes to be included in the review be expanded. As a result, if a study did not record attainment data, but reported on any of the following outcomes, it was also deemed suitable for inclusion:

- **Attendance**
- **Enrolment**
- **Grade progression**
- **School completion**
- **Drop-out**

Search

Three separate strategies were used to identify all potentially relevant empirical studies of cash transfer programs:

1. **Unzipping existing reviews**
2. **Systematic searching of digital repositories**
3. **Searching of the EEF Evidence Database**

Citation searching or 'pearl growing' (Schlosser et al., 2006) and expert nomination, were not used as an approach for study identification. The use of such approaches on their own, without subsequently adapting the search criteria are likely to increase the risk of publication bias (Higgins, 2018). Instead, these approaches were used as techniques for search-string development to improve the adequacy of search terms (Papaioannou et

al., 2010). The reference lists of records derived from initial searches were checked and if key studies identified in reference lists were not captured in the search, then the search string was amended to ensure searches were capturing all relevant records.

'Unzipping' existing reviews

12 reviews were identified as including cash transfers as an educational intervention of interest or specifically reviewed this approach. The reference lists of these reviews were imported into EPPI Reviewer to identify relevant empirical studies of the approach that could be screened for inclusion in the review.

Systematic searches

Searches were conducted in 8 online repositories/databases to identify relevant empirical studies (FirstSearch, EBSCO, Taylor & Francis, ProQuest, Elsevier, Thomson Reuters, JSTOR, 3ie). Searches were developed around key terms relevant to populations, interventions and outcomes of interest. An example of the key terms that were included in search strings are given below in Table 7. As the functionality of each database varies, a separate search string was developed for each source.

Searching for 'grey' literature (reports and unpublished studies) was also undertaken using Google Scholar. The first 200 results in Google Scholar were imported into EPPI Reviewer, in line with the recommendation of Haddaway et al., (2015).

Table 7
Key terms for populations, interventions and outcomes relevant for the cash transfer review

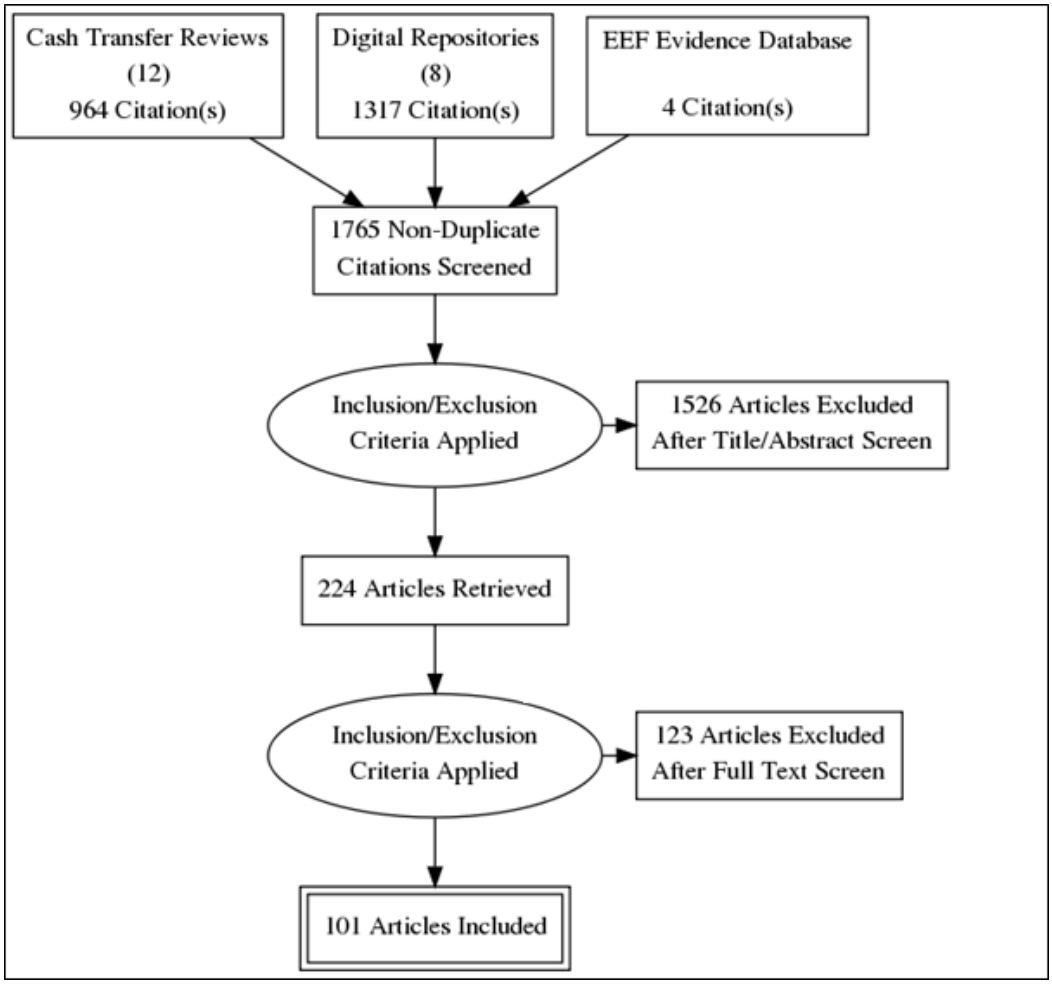
Populations	*Interventions*	*Outcomes*
"Poor household*" OR "low-income" OR Child* OR School* OR "early years" OR kindergarten OR "pre-primary" OR Primary OR "Secondary school"	"Cash transfer*" OR "cash-transfer*" OR "transfer payment*" OR "transfer program" OR "poverty alleviation transfer*" OR "child support* OR "pay* OR transfer* OR incentiv* OR hand-out* OR handout* OR grant* OR aid OR assistance OR benefit* OR "welfare grant*" OR "social protection assistance"	attainment OR achievement OR "academic achievement" impact OR "test score" OR performance OR enrol* OR attendance OR "school completion" OR dropout OR drop-out

EEF Evidence Database search

Records of individual studies contained within the EEF Evidence Database were also searched to identify relevant studies. 4 studies were identified as potentially relevant for the review and imported into EPPI Reviewer.

Once records had been identified via searches, these were imported into EPPI Reviewer, an online systematic review application. Duplicate records were removed, and remaining items were screened using inclusion criteria to assess suitability for inclusion based on title and abstract and then full text. 2,285 individual records were imported into EPPI Reviewer, with 1,765 remaining after de-duplication. 239 records were identified as potentially relevant based on title and abstract screening, with 101 remaining after screening their full text. The searching and screening process for the cash transfer review is depicted in Figure 8. The most common reasons for exclusion during full text screening were intervention or approach (65), outcome (24), language (18) and comparison (24). Disagreements were flagged in the coding software and were discussed and then reconciled by coders.

Figure 8
Flow diagram to depict searching and screening process for cash transfer review



Data collection

Once studies had been identified as suitable for inclusion in the cash transfer review, they were allocated to a team of coders who used 4 frameworks or 'codesets' to extract relevant data.

1. **EEF Evidence Database Main Data Extraction Tool**
2. **EEF Evidence Database Effect Size Data Extraction Tool**
3. **Additional Educational Outcomes Data Extraction Tool**
4. **Cash Transfer Specific Data Extraction Tool**

Two of these code sets (EEF Evidence Database Main Data Extraction Tool and EEF Evidence Database Effect Size Data Extraction Tool) are used to extract information on study design and outcomes for studies contained within the EEF Evidence Database. An additional two code sets (Additional Educational Outcomes Data Extraction Tool and Cash Transfer Specific Data Extraction Tool) were created for the purposes of this review in order to capture effects for additional educational outcomes (e.g. attendance, enrolment) that are not currently captured in the EEF Evidence Database and record features of cash transfer interventions that may mediate program effects.

EEF Evidence Database Main Data & Effect Size Data Extraction Tools

The EEF Evidence Database coding tools were developed based on a comparison of available and relevant alternative coding frameworks (e.g. EPPI Centre Education guidelines (version 0.97/2003), Lipsey and Wilson (2001), IES/WWC28, 3iE29).

Additional Educational Outcomes Data Extraction Tool

The additional educational outcome data extraction tool was developed to capture outcomes that are more commonly reported in the development literature (e.g. attendance, enrolment, drop-out, completion).

Cash Transfer Specific Data Extraction Tool

The strand specific coding tool was developed a-priori based on a comparison of moderators used in available and relevant meta-analyses/reviews of cash transfers (Garcia & Saavedra, 2017; Saavedra & Garcia, 2012) and reviewing definitions and program theories of cash transfers as reported in individual studies, reviews and meta-analyses of the approach (Baird, 2003; Conn, 2014; Damon, 2016; Engle, 2011; Garcia, 2017; Jackson, 2019; Kremer, 2013; Krishnaratne, 2013; Murnane, 2014; Saaverda, 2012; Snilstveit, 2016).

Data synthesis

The aim of this review is to identify and summarize quantifiable school attainment and other educational outcomes from primary empirical studies which meet the inclusion criteria and match the definition of a cash transfer program.

To calculate an average effect for these interventions, the Standardised Mean Difference (d-index) or effect size was used as the key metric. For studies that reported descriptive statistics for continuous measures of pupil outcomes, the post-intervention mean of the control group was subtracted from the post-intervention mean of the intervention group and the resulting difference divided by the pooled standard deviation, adjusted for sample size (Hedges' g). An accompanying standard error (representing the 95% confidence interval) was also recorded. Wherever possible, descriptive outcome statistics (N, means and standard deviations for control and intervention groups) were collected, even when the study report reported an effect size and accompanying standard error, or where an effect size could be calculated from other inferential statistics.

All effect sizes were coded as either resulting from a post-test or gain comparison. These effect sizes were meta-analysed separately as they may represent different metrics (such as when the intervention affects the relative spread of the intervention group) (Xiao, Higgins & Kasim, 2017). For studies where there was a substantial baseline imbalance, a gain score effect size was selected (such as in quasi-experimental designs or natural experiments).

Outcome data however, was reported in a variety of formats. For studies that reported inferential statistics such as t, F, or p-values only, the appropriate conversion formula was applied to calculate the d-index as the effect size estimate (Hedges & Olkin, 1985; Lipsey & Wilson, 2001; Hedges, Shymansky & Woodworth, 1989). To ensure appropriate corrections for the small sample size bias, all d-indices were converted to the unbiased Hedges' g statistic.

After data checking and cleaning, this was data was used to conduct a meta-analysis of included studies. Independent effect sizes were aggregated across studies using a random effects model (Borenstein et al., 2010) as the assumptions for applying a fixed effect model will not be met (i.e. conceptual similarity of the interventions and approaches in each strand or a sample constituting the complete population of relevant studies). The results from a random effects model analysis also perhaps best represent the overall effect of a collection of educational interventions and approaches across different age groups, school subjects and educational contexts.

A series of analyses were undertaken to check aggregation of effect sizes across studies, sensitivity analyses (see below) and to replicate moderator analyses, using Comprehensive MetaAnalysis 3.0.32. A random effects model was adopted for each meta-analysis and the heterogeneity of the distribution of the effect sizes. Study features coded using the cash transfer specific code set were further explored through moderator variable analysis under a mixed effects model, as potential sources of systematic variation.

To assess potential bias associated with individual out-of-range calculated effect sizes which may potentially distort the overall interpretation of the findings, a sensitivity analysis was undertaken (Hedges & Olkin, 1985). This was to determine whether the removal of a particular effect size increases the fit of the remaining effect sizes in a homogeneous distribution while not substantially affecting the interpretation of the recalculated mean effect size. Various approaches to identifying potential outliers were used, including visual examination of data organized into a forest plots and also performing "one study removed" (Baker, & Jackson, 2008). Identified outliers were examined with the potential to remove them from the final dataset. Potential sources of bias, such as study design, type of treatment, publication source, missing data, sample size, or attrition, were carefully examined through the corresponding moderator variable analyses.

Relying on available and published studies may bias or inflate the overall intervention effect, particularly in education with a relatively large proportion of smaller studies. To evaluate potential publication bias across the database, the association between publication type and the pooled effect (i.e. journal article, dissertation or thesis, technical report, book or book chapter, conference paper, and other) was reviewed. Thesis completion is not usually influenced by the size of the effect, unlike journal articles. Other methods for assessing publication bias were utilised, such as a visual inspection of a funnel plot or Duval & Tweedie's (2000) trim and fill routine available in Comprehensive Meta-Analysis (CMA)37 (Borenstein et al., 2005). Becker (2005) and Banks et al. (2012), however, recommend the discontinuation of the use of the failsafe N to assess publication bias, as the results are often inconsistent with the results from other

publication bias methods. In education all of the methods to detect publication bias are problematic due to the negative association between sample size and effect size (Slavin & Madden, 2011).

Results

Tables 8 and 9 describe the variables that were modified before undertaking the analysis. Table 8 describes common variables, while table 9 describes strand specific variables.

Common variables

Table 8.
Comparison between modified and original variable changes

Modified	Original	N
pub_year	**pub_year**	**26**
After 2011 (N = 16)	Range: [2012-2018]	16
Up to 2011 (N = 10)	Range: [2000-2011]	10
out_es_type	**out_es_type**	**25**
Post-test adjusted (N = 17)	['Post-test adjusted for baseline attainment']	6
	['Post-test adjusted for baseline attainment AND clustering']	11
Post-test unadjusted (N = 8)	['Post-test unadjusted (select one from this group)']	8
out_samp	**out_samp**	**25**
Average/Low achievers (N = 10)	['Sample: Low achievers']	10
Sample: All (N = 15)	['Sample: All']	15
out_measure	**out_measure**	**23**
Literacy (N = 10)	Literacy reading comprehension	5
	Literacy reading other	2
	Literacy writing	3
Mathematics (N = 4)	Mathematics	4
Other (N = 9)	Cognitive other	1
	Combined subjects	5
	Curriculum other	3
out_test_type_raw	**out_test_type_raw**	**25**
Researcher/School-developed test (N = 18)	['Test type: Researcher developed test']	2
	['Test type: School-developed test']	16
Standardised/(Inter)National test (N = 7)	['Test type: National test']	2
	['Test type: Standardised test ']	5

Modified	Original	N
sample_analysed_info	**sample_analysed_info**	**26**
More than median (3474.5) (N = 13)	Range: [3997-293800]	13
Up to median (3474.5) (N = 13)	Range: [506-2952]	13
int_setting_raw	**int_setting_raw**	**26**
Primary/elementary school (N = 10)	['Nursery school/pre-school', 'Primary/elementary school']	1
	['Primary/elementary school', 'Secondary/High school', 'No information provided']	1
	['Primary/elementary school', 'Secondary/High school']	4
	['Nursery school/pre-school']	1
	['Primary/elementary school', 'Middle school']	1
	['Primary/elementary school']	2
Secondary/High school (N = 14)	['Primary/elementary school', 'Secondary/High school']	7
	['Secondary/High school']	5
	['Primary/elementary school', 'Middle school', 'Secondary/High school']	2
NA	['No information provided', 'Primary/elementary school', 'Middle school', 'Secondary/High school']	1
	['Nursery school/pre-school', 'Primary/elementary school', 'Middle school', 'Secondary/High school']	1
loc_country_raw	**loc_country_raw**	**23**
High/Middle income (N = 18)	['Brazil']	3
	['China']	1
	['Colombia']	2
	['Costa Rica']	1
	['Ecuador']	1
	['Jamaica']	1
	['Mexico']	6
	['Peru']	1
	['Thailand']	1
	['USA']	1
Low income (N = 5)	['Indonesia']	1
	['Malawi']	3
	['Uganda']	1
int_desig_raw	**int_desig_raw**	**25**
QED (N = 11)	['Prospective QED']	2
	['Regression Continuity - naturally occurring']	2
	['Retrospective QED']	7
RCT (N = 14)	['Cluster RCT']	10

Modified	Original	N
	['Individual RCT']	2
	['Multisite RCT']	1
	['Regression Discontinuity with randomisation']	1
int_who_raw	**int_who_raw**	**21**
Class teachers (N = 9)	['Class teachers', 'Unclear/not specified']	1
	['Class teachers']	8
Unclear/ Not specified (N = 17)	['Unclear/not specified']	12
int_dur_info	**int_dur_info**	**21**
More than median (104) (N = 9)	Range: [108-624]	9
Up to median (104) (N = 12)	Range: [40-104]	12
int_freq_info	**int_freq_info**	**20**
Less than median (0.25) (N = 9)	Range: [0.0192307692-0.16]	9
Median or more (0.25) (N = 11)	Range: [0.25-0.25]	11

Strand specific variables

Table 9. Comparison between modified and original strand specific variables

Modified	Original	N
ct_eligibility_SS	**ct_eligibility_SS**	**26**
All others (N = 13)	['Household income', 'Other']	1
	['Household income', 'Targeted population (please provide details in info box)']	1
	['Other']	1
	['Targeted population (please provide details in info box)']	6
	['Village/neighbourhood income', 'Household income']	1
	['Village/neighbourhood income', 'Targeted population (please provide details in info box)']	1
	['Village/neighbourhood income']	2
Household income (N = 13)	['Household income']	13
ct_means_tested_SS	**ct_means_tested_SS**	**25**
No/Not reported/NA (N = 12)	['No']	4
	['Not reported/Unclear']	7
Yes (N = 14)	['If means testing was conducted, what was the threshold? (details in info box)', 'Yes']	1
	['Yes', 'If means testing was conducted, what was the threshold? (details in info box)']	10
	['Yes']	3
ct_transfer_limit_SS	**ct_transfer_limit_SS**	**26**

Modified	Original	N
No/Not reported (N = 16)	['No limit']	10
	['Not reported/Unclear']	6
Yes (N = 10)	['Yes, maximum amount per family (details in info box)']	8
	['Yes, maximum number of beneficiaries (details in info box)']	2
ct_time_limit_SS	**ct_time_limit_SS**	**26**
No/Not reported/NA (N = 15)	['No time limit']	6
	['Not reported/Unclear']	9
Yes (N = 11)	['Yes - time limited']	11
ct_health_conditions_SS	**ct_health_conditions_SS**	**18**
Not reported/NA (N = 16)	['Not reported/Unclear']	8
Yes (N = 10)	['Health visits for pregnant and breastfeeding women', 'Mothers attendance at health education workshops']	1
	['Student attendance at health check-ups', 'Health visits for pregnant and breastfeeding women']	1
	['Student attendance at health check-ups', 'Mothers attendance at health education workshops']	1
	['Student attendance at health check-ups', 'Student immunizations up-to-date', 'Health visits for pregnant and breastfeeding women', 'Mothers attendance at health education workshops']	1
	['Student attendance at health check-ups', 'Student immunizations up-to-date', 'Mothers attendance at health education workshops']	2
	['Student attendance at health check-ups', 'Student immunizations up-to-date']	1
	['Student attendance at health check-ups']	3
ct_monitoring_SS	**ct_monitoring_SS**	**26**
No monitoring/ not reported/ Other (N = 12)	['No monitoring']	3
	['Not reported/Unclear']	8
	['Other (detail in info box)']	1
School enrolment/attendance (N = 14)	['School attendance', 'Grade promotion', 'Other (detail in info box)']	1
	['School attendance']	4
	['School enrolment', 'School attendance', 'Grade promotion', 'Not reported/Unclear']	1
	['School enrolment', 'School attendance', 'Grade promotion']	2
	['School enrolment', 'School attendance']	4
	['School enrolment']	2
ct_verification_SS	**ct_verification_SS**	**25**
No verification; not reported; Other (N = 12)	['No verification']	4
	['Not reported/Unclear']	7
School enrolment/attendance; Health attendance (N = 14)	['Health attendance', 'Other (details in info box)']	1
	['School attendance', 'Health attendance']	1
	['School attendance']	4

Modified	Original	N
	['School enrolment', 'School attendance', 'Grade promotion', 'Other (details in info box)']	1
	['School enrolment', 'School attendance', 'Grade promotion']	1
	['School enrolment', 'School attendance', 'Health attendance', 'Not reported/Unclear']	1
	['School enrolment', 'School attendance']	2
	['School enrolment']	3
ct_min_attend_req_SS	**ct_min_attend_req_SS**	**25**
No/Not reported/NA (N = 13)	['No']	5
	['Not reported/Unclear']	7
Yes (N = 13)	['Yes']	13
ct_perc_attend_req_SS	**ct_perc_attend_req_SS**	**21**
80% and above (N = 13)	['80%']	4
	['85%']	7
	['90%']	1
	['95%']	1
Not reported/NA (N = 13)	['Not reported/Unclear']	7
	['Other (detail in info box)']	1
ct_enforcement_SS	**ct_enforcement_SS**	**25**
Attendance/Enrollment/Other (N = 10)	['Attendance at school', 'Enrolment at school', 'Not reported/Unclear']	1
	['Attendance at school', 'Enrolment at school']	1
	['Attendance at school', 'Other (details in info box)']	1
	['Attendance at school']	4
	['Enrolment at school']	2
	['Other (details in info box)']	1
No enforcement/ Not reported/NA (N = 16)	['No enforcement']	3
	['Not reported/Unclear']	12
ct_prog_type_SS	**ct_prog_type_SS**	**25**
Conditional: Type 3, 4, 5, 6 (N = 18)	['Level 5 - Conditional transfers where school enrolment conditions are monitored and enforced']	4
	['Level 6 - Conditional transfers where school attendance conditions are monitored and enforced']	4
	['Type 3 - Conditional transfers where conditions are not monitored or enforced']	2
	['Type 4 - Conditional transfers where conditions are monitored imperfectly and with little enforcement']	7
Unconditional: Type 0, 1, 2, 7 (N = 8)	['Level 7 - Insufficient information to assign a category']	3
	['Type 0 - Program is unconditional and not targeted at children e.g. pension transfer']	1
	['Type 1 - Unconditional program with the aim to improve educational outcomes']	1

Modified	Original	N
	['Type 2 - Labelled transfers where participants are explicitly told that they are for use for education, but without any conditions']	3

Overall Meta-Analysis: Forrest Plots

Figure 9

Forest plot of main Toolkit outcome (attainment)

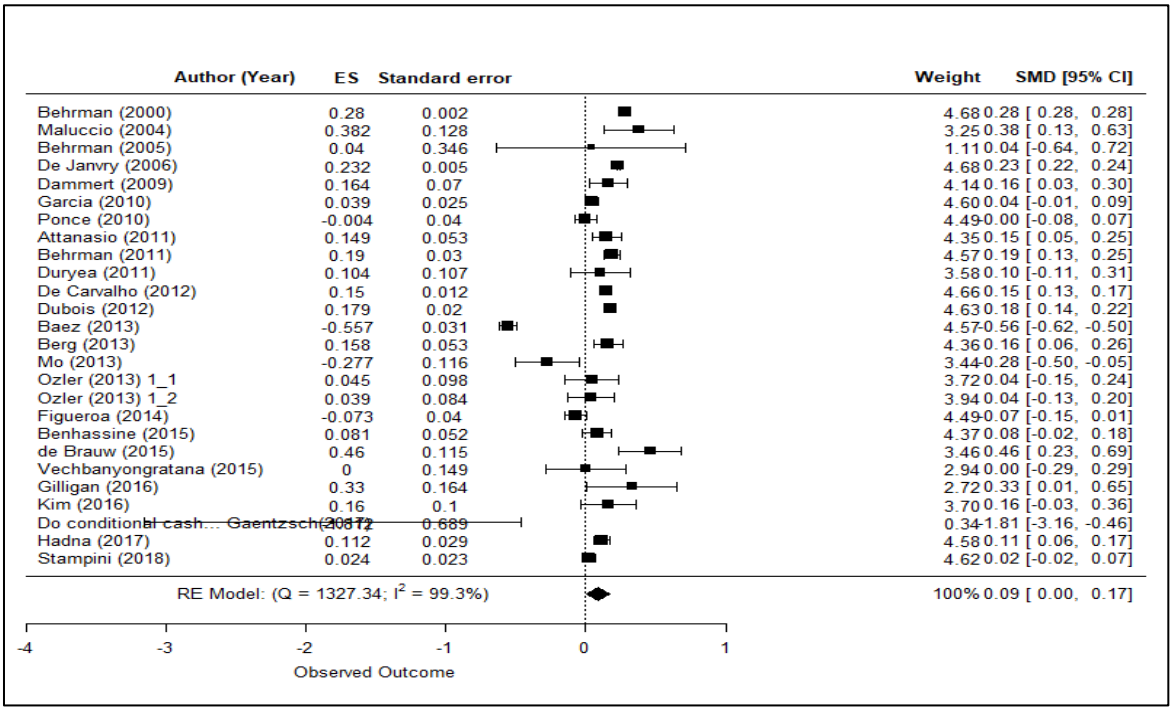


Figure 10

Forest plot of main reading outcomes

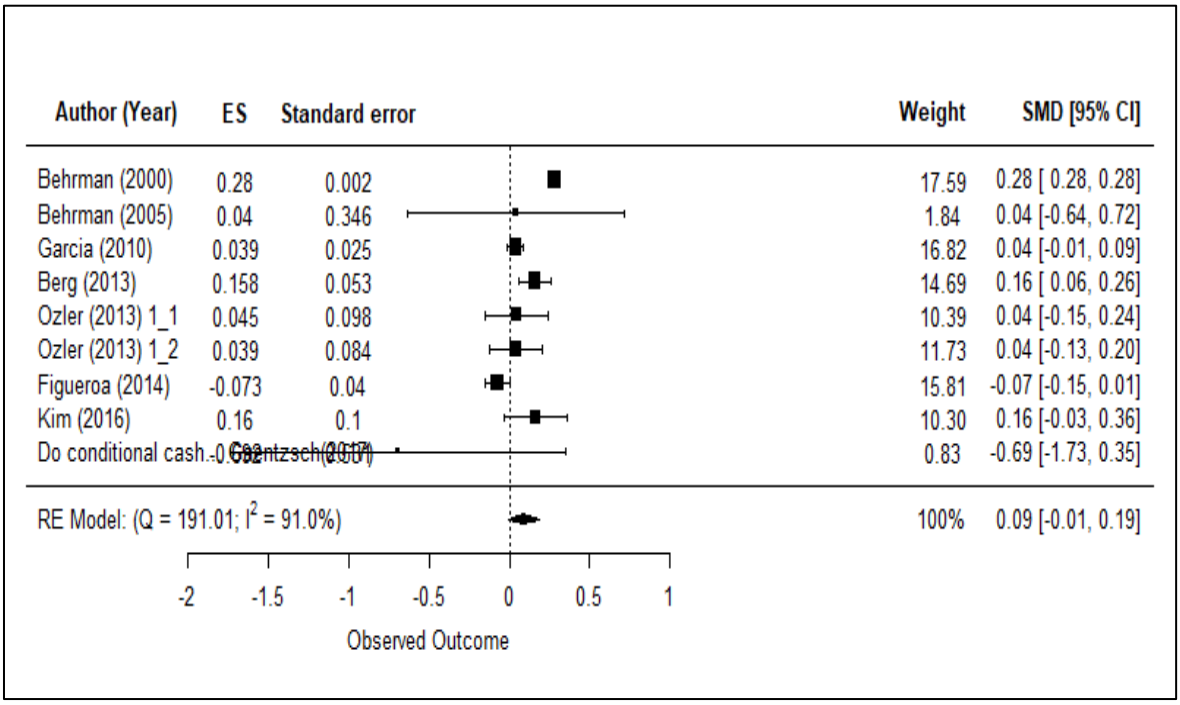
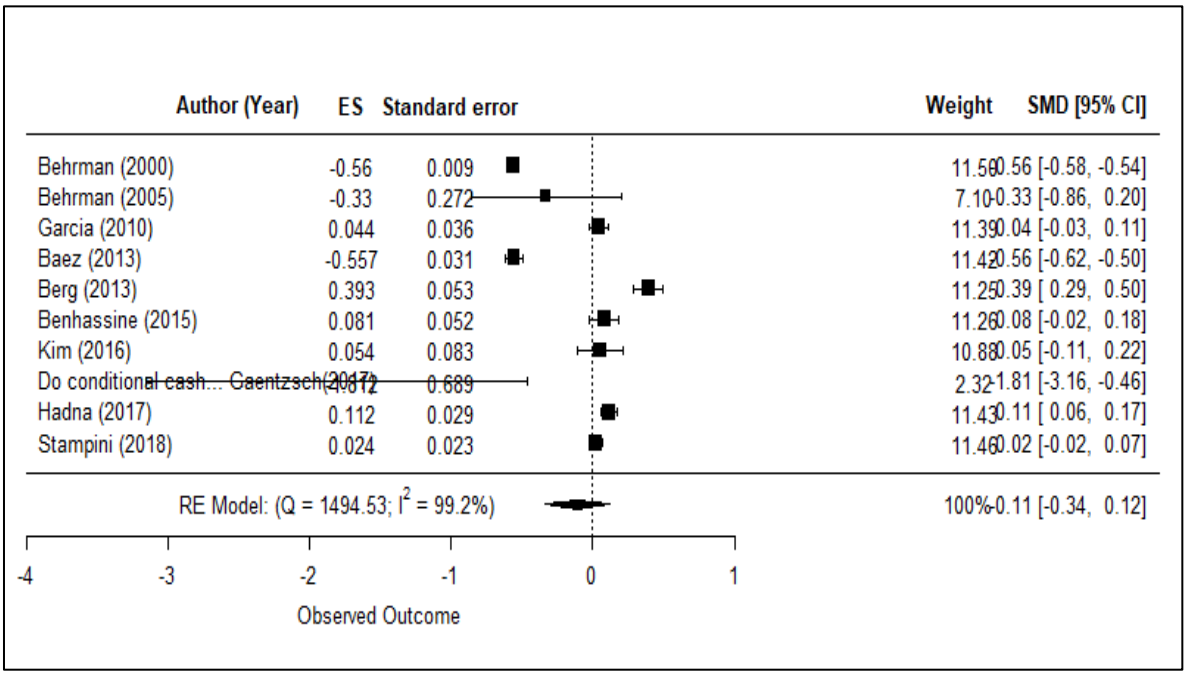


Figure 11

Forest plot of main mathematics outcomes



Primary School Meta-analysis

Figure 12

Sub-group meta-analysis for primary schools: Forest plot of main Toolkit outcome

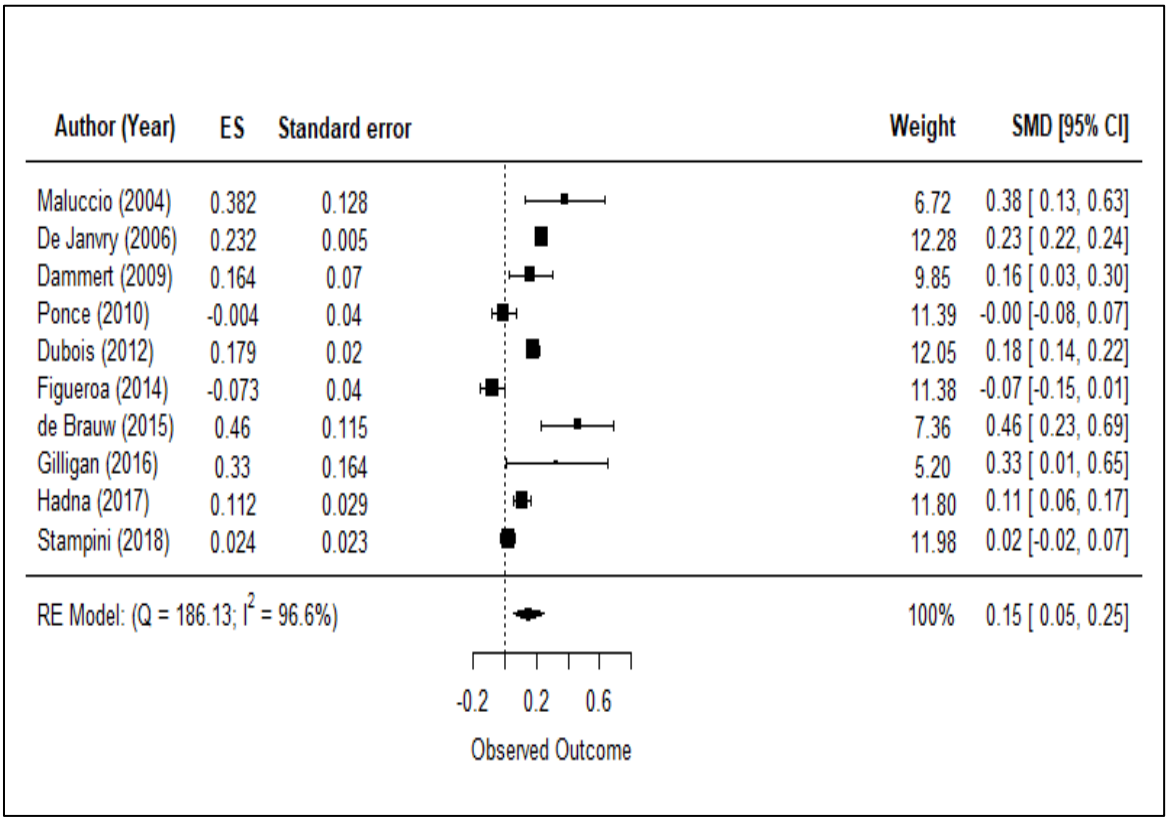


Figure 13

Sub-group meta-analysis for secondary schools: Forest plot of main Toolkit outcome

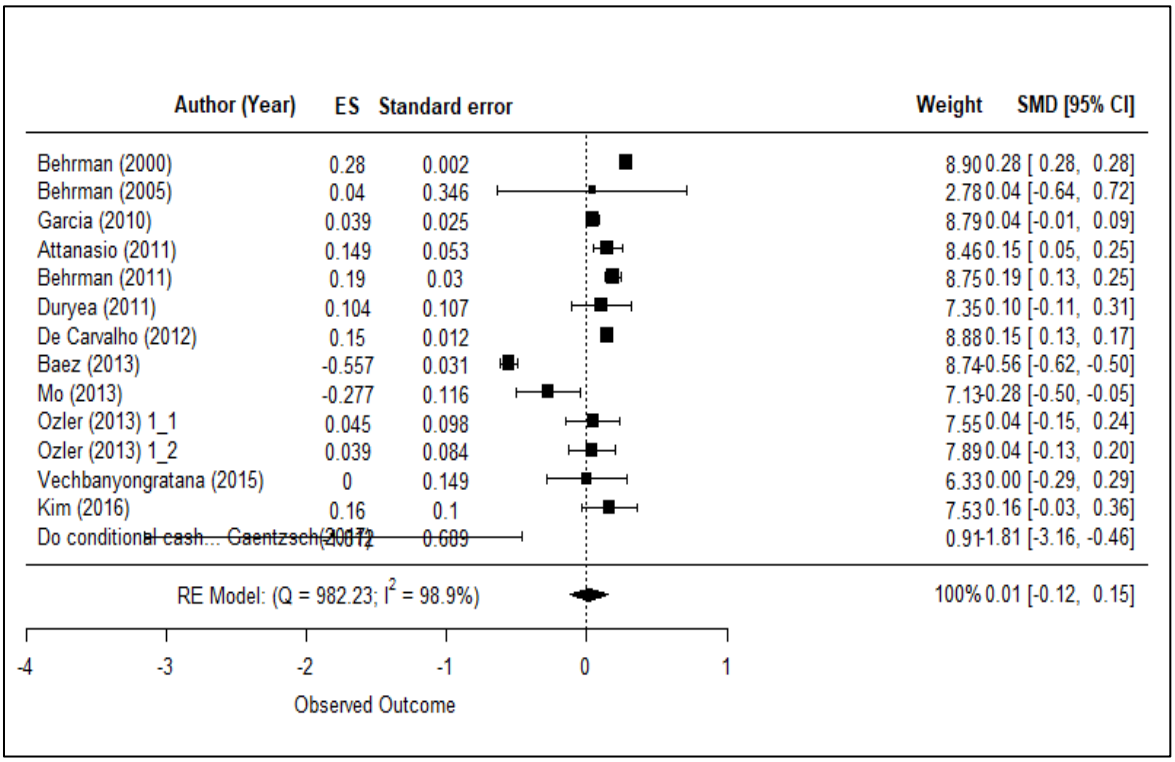


Figure 14

Sub-group meta-analysis for secondary schools: Forest plot of main reading outcomes

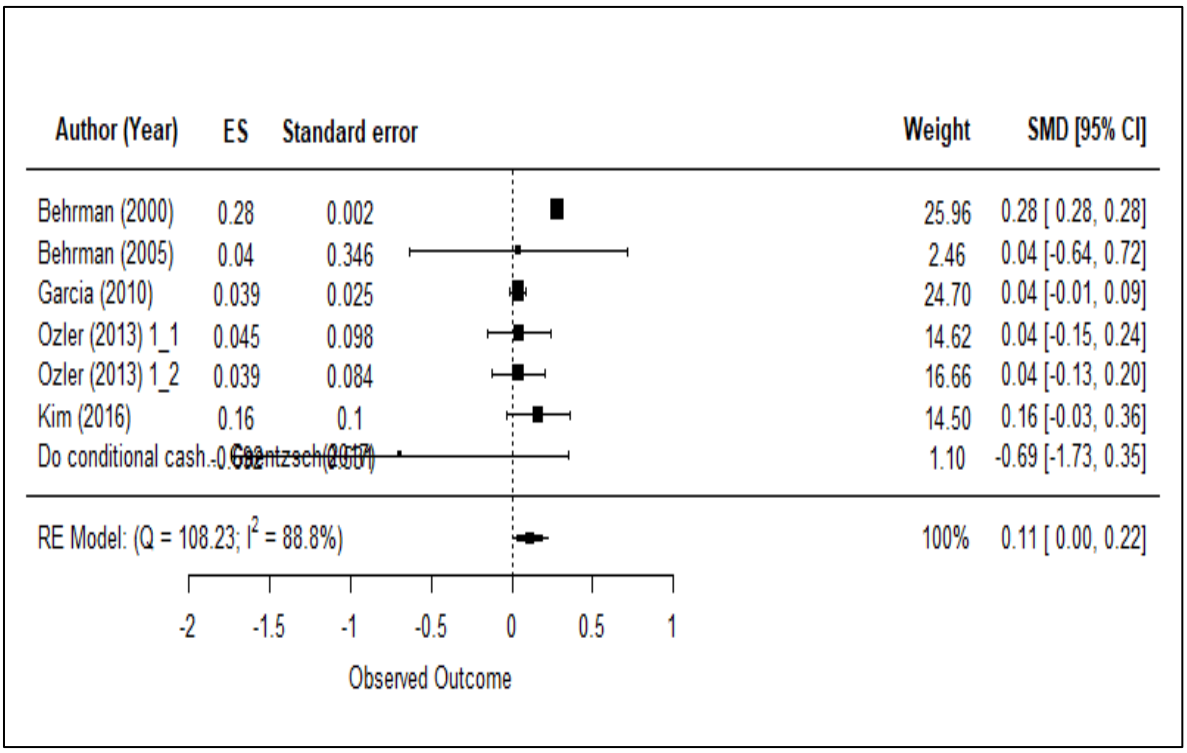
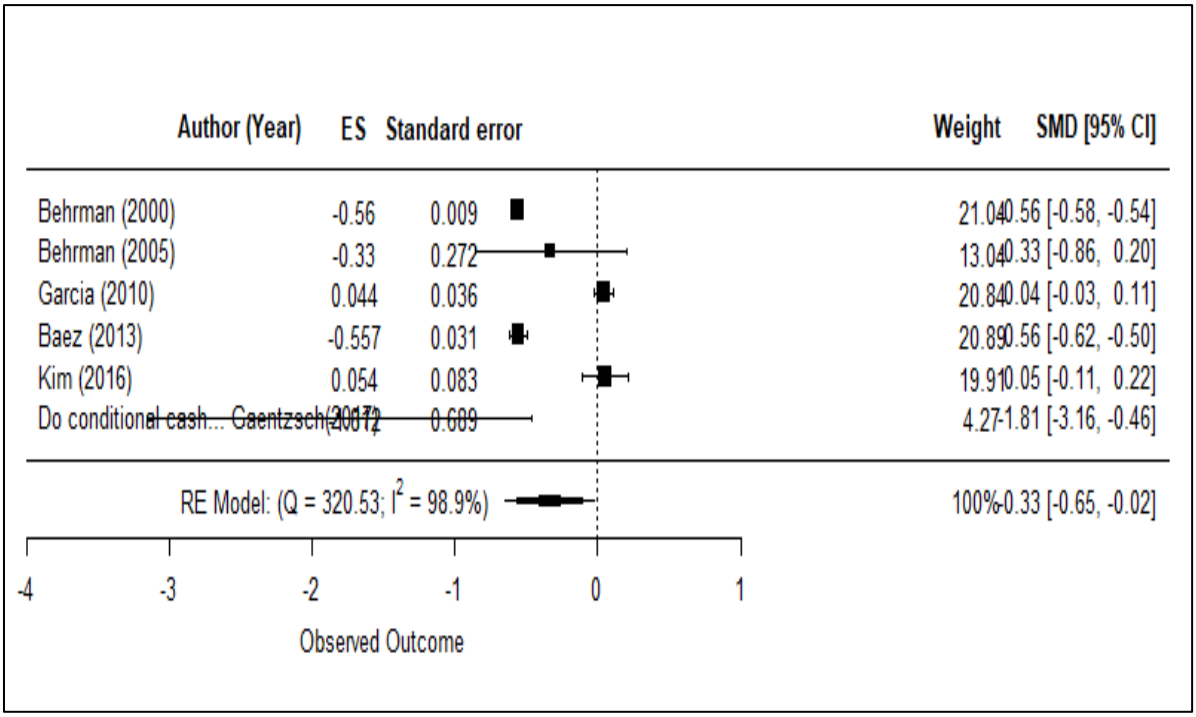


Figure 15

Sub-group meta-analysis for secondary schools: Forest plot of main reading outcomes



Overall Meta-Analysis: Tables

In the following tables for forest plots, three decimal places were used to provide more detail, even if two decimal places were used in each of the forest plots given above.

Table 10. Overall meta-analysis: Data for the forest plot of main Toolkit outcome

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Behrman (2000)	0.28	0.002	0.276	0.284	4.683	0.280 [0.276, 0.284]
Maluccio (2004)	0.382	0.128	0.131	0.633	3.252	0.382 [0.131, 0.633]
Behrman (2005)	0.04	0.346	-0.638	0.718	1.111	0.040 [-0.638, 0.718]
De Janvry (2006)	0.232	0.005	0.222	0.242	4.68	0.232 [0.222, 0.242]
Dammert (2009)	0.164	0.07	0.027	0.301	4.138	0.164 [0.027, 0.301]
Garcia (2010)	0.039	0.025	-0.01	0.089	4.603	0.039 [-0.010, 0.089]
Ponce (2010)	-0.004	0.04	-0.082	0.074	4.493	-0.004 [-0.082, 0.074]
Attanasio (2011)	0.149	0.053	0.045	0.253	4.355	0.149 [0.045, 0.253]
Behrman (2011)	0.19	0.03	0.131	0.249	4.573	0.190 [0.131, 0.249]
Duryea (2011)	0.104	0.107	-0.106	0.314	3.582	0.104 [-0.106, 0.314]
De Carvalho (2012)	0.15	0.012	0.126	0.174	4.665	0.150 [0.126, 0.174]
Dubois (2012)	0.179	0.02	0.14	0.218	4.633	0.179 [0.140, 0.218]
Baez (2013)	-0.557	0.031	-0.617	-0.496	4.565	-0.557 [-0.617, -0.496]
Berg (2013)	0.158	0.053	0.055	0.261	4.359	0.158 [0.055, 0.261]
Mo (2013)	-0.277	0.116	-0.504	-0.05	3.44	-0.277 [-0.504, -0.050]
Ozler (2013) 1_1	0.045	0.098	-0.148	0.238	3.715	0.045 [-0.148, 0.238]
Ozler (2013) 1_2	0.039	0.084	-0.125	0.203	3.943	0.039 [-0.125, 0.203]
Figueroa (2014)	-0.073	0.04	-0.151	0.005	4.492	-0.073 [-0.151, 0.005]
Benhassine (2015)	0.081	0.052	-0.021	0.183	4.366	0.081 [-0.021, 0.183]
de Brauw (2015)	0.46	0.115	0.235	0.685	3.456	0.460 [0.235, 0.685]
Vechbanyongratana (2015)	0	0.149	-0.291	0.291	2.938	0.000 [-0.291, 0.291]
Gilligan (2016)	0.33	0.164	0.009	0.652	2.719	0.330 [0.009, 0.652]
Kim (2016)	0.16	0.1	-0.035	0.355	3.7	0.160 [-0.035, 0.355]
Gaentzsch(2017)	-1.812	0.689	-3.162	-0.462	0.341	-1.812 [-3.162, -0.462]
Hadna (2017)	0.112	0.029	0.056	0.169	4.58	0.112 [0.056, 0.169]
Stampini (2018)	0.024	0.023	-0.021	0.069	4.618	0.024 [-0.021, 0.069]
RE Model: Q = 1327.337; τ^2 = 0.037; I^2 = 99.348%						**0.086 [0.004, 0.168]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 11. Sub-group meta-analysis: Data for the forest plot of main reading outcomes

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Behrman (2000)	0.28	0.002	0.276	0.284	17.59	0.280 [0.276, 0.284]
Behrman (2005)	0.04	0.346	-0.638	0.718	1.841	0.040 [-0.638, 0.718]
Garcia (2010)	0.039	0.025	-0.01	0.089	16.819	0.039 [-0.010, 0.089]
Berg (2013)	0.158	0.053	0.055	0.261	14.689	0.158 [0.055, 0.261]
Ozler (2013) 1_1	0.045	0.098	-0.148	0.238	10.389	0.045 [-0.148, 0.238]
Ozler (2013) 1_2	0.039	0.084	-0.125	0.203	11.732	0.039 [-0.125, 0.203]
Figueroa (2014)	-0.073	0.04	-0.151	0.005	15.805	-0.073 [-0.151, 0.005]
Kim (2016)	0.16	0.1	-0.035	0.355	10.302	0.160 [-0.035, 0.355]
Gaentzsch(2017)	-0.692	0.531	-1.733	0.349	0.832	-0.692 [-1.733, 0.349]
RE Model: Q = 191.011; τ^2 = 0.014; I^2 = 90.964%						**0.088 [-0.009, 0.186]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 12. Sub-group meta-analysis: Data for the forest plot of main mathematics outcomes

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Behrman (2000)	-0.56	0.009	-0.578	-0.542	11.503	-0.560 [-0.578, -0.542]
Behrman (2005)	-0.33	0.272	-0.864	0.204	7.102	-0.330 [-0.864, 0.204]
Garcia (2010)	0.044	0.036	-0.027	0.114	11.389	0.044 [-0.027, 0.114]
Baez (2013)	-0.557	0.031	-0.617	-0.496	11.419	-0.557 [-0.617, -0.496]
Berg (2013)	0.393	0.053	0.289	0.496	11.246	0.393 [0.289, 0.496]
Benhassine (2015)	0.081	0.052	-0.021	0.183	11.256	0.081 [-0.021, 0.183]
Kim (2016)	0.054	0.083	-0.109	0.218	10.879	0.054 [-0.109, 0.218]
Gaentzsch(2017)	-1.812	0.689	-3.162	-0.462	2.315	-1.812 [-3.162, -0.462]
Hadna (2017)	0.112	0.029	0.056	0.169	11.431	0.112 [0.056, 0.169]
Stampini (2018)	0.024	0.023	-0.021	0.069	11.46	0.024 [-0.021, 0.069]
RE Model: Q = 1494.528; τ^2 = 0.120; I^2 = 99.203%						**-0.114 [-0.344, 0.116]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 13. Sub-group meta-analysis: Data for the forest plot of main science outcomes

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Stampini (2018)	0.02	0.023	-0.024	0.065	100	0.020 [-0.024, 0.065]
RE Model: Q = 0.000; τ^2 = 0.000; I^2 = 0.000%						**0.020 [-0.024, 0.065]**

Primary School Meta-Analysis: Tables

Table 14. Sub-group meta-analysis: Data for the forest plot of main Toolkit outcome for primary schools

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Maluccio (2004)	0.382	0.128	0.131	0.633	6.716	0.382 [0.131, 0.633]
De Janvry (2006)	0.232	0.005	0.222	0.242	12.28	0.232 [0.222, 0.242]
Dammert (2009)	0.164	0.07	0.027	0.301	9.849	0.164 [0.027, 0.301]
Ponce (2010)	-0.004	0.04	-0.082	0.074	11.386	-0.004 [-0.082, 0.074]
Dubois (2012)	0.179	0.02	0.14	0.218	12.052	0.179 [0.140, 0.218]
Figueroa (2014)	-0.073	0.04	-0.151	0.005	11.382	-0.073 [-0.151, 0.005]
de Brauw (2015)	0.46	0.115	0.235	0.685	7.36	0.460 [0.235, 0.685]
Gilligan (2016)	0.33	0.164	0.009	0.652	5.202	0.330 [0.009, 0.652]
Hadna (2017)	0.112	0.029	0.056	0.169	11.796	0.112 [0.056, 0.169]
Stampini (2018)	0.024	0.023	-0.021	0.069	11.978	0.024 [-0.021, 0.069]
RE Model: Q = 186.135; τ^2 = 0.020; I^2 = 96.640%						**0.150 [0.054, 0.247]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 15. Sub-group meta-analysis: Data for the forest plot of main reading outcomes for primary schools

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Figueroa (2014)	-0.073	0.04	-0.151	0.005	100	-0.073 [-0.151, 0.005]
RE Model: Q = 0.000; τ^2 = 0.000; I^2 = 0.000%						**-0.073 [-0.151, 0.005]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 16. Sub-group meta-analysis: Data for the forest plot of main mathematics outcomes for primary schools

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Hadna (2017)	0.112	0.029	0.056	0.169	48.002	0.112 [0.056, 0.169]
Stampini (2018)	0.024	0.023	-0.021	0.069	51.998	0.024 [-0.021, 0.069]
RE Model: Q = 5.722; τ^2 = 0.003; I^2 = 82.522%						**0.067 [-0.020, 0.153]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 17. Sub-group meta-analysis: Data for the forest plot of main science outcomes for primary schools

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Stampini (2018)	0.02	0.023	-0.024	0.065	100	0.020 [-0.024, 0.065]
RE Model: Q = 0.000; τ^2 = 0.000; I^2 = 0.000%						**0.020 [-0.024, 0.065]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Secondary School Meta-Analysis: Tables

Table 18. Sub-group meta-analysis: Data for the forest plot of main Toolkit outcome for secondary schools

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Behrman (2000)	0.28	0.002	0.276	0.284	8.898	0.280 [0.276, 0.284]
Behrman (2005)	0.04	0.346	-0.638	0.718	2.779	0.040 [-0.638, 0.718]
Garcia (2010)	0.039	0.025	-0.01	0.089	8.795	0.039 [-0.010, 0.089]
Attanasio (2011)	0.149	0.053	0.045	0.253	8.462	0.149 [0.045, 0.253]
Behrman (2011)	0.19	0.03	0.131	0.249	8.754	0.190 [0.131, 0.249]
Duryea (2011)	0.104	0.107	-0.106	0.314	7.351	0.104 [-0.106, 0.314]
De Carvalho (2012)	0.15	0.012	0.126	0.174	8.876	0.150 [0.126, 0.174]
Baez (2013)	-0.557	0.031	-0.617	-0.496	8.745	-0.557 [-0.617, -0.496]
Mo (2013)	-0.277	0.116	-0.504	-0.05	7.134	-0.277 [-0.504, -0.050]
Ozler (2013) 1_1	0.045	0.098	-0.148	0.238	7.552	0.045 [-0.148, 0.238]
Ozler (2013) 1_2	0.039	0.084	-0.125	0.203	7.886	0.039 [-0.125, 0.203]
Vechbanyongratana (2015)	0	0.149	-0.291	0.291	6.326	0.000 [-0.291, 0.291]

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Kim (2016)	0.16	0.1	-0.035	0.355	7.528	0.160 [-0.035, 0.355]
Gaentzsch(2017)	-1.812	0.689	-3.162	-0.462	0.914	-1.812 [-3.162, -0.462]
RE Model: Q = 982.233; τ^2 = 0.054; I^2 = 98.945%						**0.013 [-0.123, 0.150]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 19. Sub-group meta-analysis: Data for the forest plot of main reading outcome for secondary schools

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Behrman (2000)	0.28	0.002	0.276	0.284	25.963	0.280 [0.276, 0.284]
Behrman (2005)	0.04	0.346	-0.638	0.718	2.456	0.040 [-0.638, 0.718]
Garcia (2010)	0.039	0.025	-0.01	0.089	24.697	0.039 [-0.010, 0.089]
Ozler (2013) 1_1	0.045	0.098	-0.148	0.238	14.625	0.045 [-0.148, 0.238]
Ozler (2013) 1_2	0.039	0.084	-0.125	0.203	16.66	0.039 [-0.125, 0.203]
Kim (2016)	0.16	0.1	-0.035	0.355	14.495	0.160 [-0.035, 0.355]
Do conditional cash... Gaentzsch(2017)	-0.692	0.531	-1.733	0.349	1.103	-0.692 [-1.733, 0.349]
RE Model: Q = 108.227; τ^2 = 0.013; I^2 = 88.773%						**0.112 [0.000, 0.224]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Table 20. Sub-group meta-analysis: Data for the forest plot of main mathematics outcome for secondary schools

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Behrman (2000)	-0.56	0.009	-0.578	-0.542	21.045	-0.560 [-0.578, -0.542]
Behrman (2005)	-0.33	0.272	-0.864	0.204	13.042	-0.330 [-0.864, 0.204]
Garcia (2010)	0.044	0.036	-0.027	0.114	20.838	0.044 [-0.027, 0.114]
Baez (2013)	-0.557	0.031	-0.617	-0.496	20.893	-0.557 [-0.617, -0.496]
Kim (2016)	0.054	0.083	-0.109	0.218	19.914	0.054 [-0.109, 0.218]
Do conditional cash... Gaentzsch(2017)	-1.812	0.689	-3.162	-0.462	4.269	-1.812 [-3.162, -0.462]
RE Model: Q = 320.533; τ^2 = 0.121; I^2 = 98.852%						**-0.335 [-0.647, -0.022]**

[a]SMD:Standardised mean difference

[b]LB: Lower Bound

[c]UB: upper Bound

[d]CI: Confidence Interval

Bivariate analysis including moderators

Before starting, the following factor variables were removed from the analysis due to imbalance in the frequencies for their categories. If a certain factor variable has at least two categories, each with a sample size greater than or equal to the threshold, then that variable was included in the bivariate and multivariate analyses. The threshold was defined as follows:

$$Threshold = \begin{cases} \geq 5 & \textbf{Number of available cases for this variable} \leq 30 \\ \geq 10 & \textbf{Number of available cases for this variable lies in [31, 50]} \\ \geq 15 & \textbf{Number of available cases for this variable lies in [51, 100]} \\ \geq 20 & \textbf{Number of available cases for this variable} \geq 101 \end{cases}$$

The labels of each moderator name were obtained from **"Data specification for Metafor.xlsx"** file. in the following table, models with R2 greater than zero are highlighted. So the highlighted moderators are ordered based on their contribution to the reduction of heterogeneity (R^2). It is is mathematically formulated as follows:

$$R^2 = max\left(\frac{(\tau^2_{Reduced} - \tau^2_{Full})}{\tau^2_{Reduced}}, 0\right) * 100.$$

Where $\tau^2_{Reduced}$ is the heterogeneity of meta-analysis model (without moderator) and τ^2_{Full} is the heterogeniety of the meta-regression model (with moderator).

Table 21. Meta-analysis and models with R2 greater than zero are highlighted in yellow

Moderator	SMD[c]	95% LB[d]	95% UB[e]	N
Overall	0.086	0.004	0.168	26
RE Model: τ^2 = 0.037; Q = 1327.337; I^2 = 99.348%[a]				
out_test_type_raw				25
Standardised/(Inter)National test	Reference	Reference	Reference	7
Researcher/School-developed test	0.125	0.02	0.231	18
ME Model: τ^2 = 0.008; Q = 406.967; R^2 = 35.987%; I^2 = 96.941%[b]				
Outcome measure (Outcome screen: Intervention)				23
Literacy	Reference	Reference	Reference	10
Mathematics	-0.274	-0.514	-0.033	4
Other	0.083	-0.1	0.266	9
ME Model: τ^2 = 0.033; Q = 552.478; R^2 = 21.857%; I^2 = 95.777%[b]				
int_when_raw				26
Other	Reference	Reference	Reference	17
Unclear/ Not specified	-0.145	-0.305	0.015	9
ME Model: τ^2 = 0.032; Q = 740.214; R^2 = 13.898%; I^2 = 99.242%[b]				
Outcome sample				25
Sample: All	Reference	Reference	Reference	15
Average/Low achievers	0.072	-0.03	0.174	10
ME Model: τ^2 = 0.011; Q = 494.606; R^2 = 9.684%; I^2 = 93.924%[b]				
ct_health_conditions_SS				26
Not reported/NA	Reference	Reference	Reference	16
Yes	0.132	-0.033	0.298	10
ME Model: τ^2 = 0.034; Q = 1272.806; R^2 = 8.236%; I^2 = 99.282%[b]				
Publication year				26
After 2011	Reference	Reference	Reference	16
Up to 2011	0.127	-0.036	0.29	10
ME Model: τ^2 = 0.035; Q = 766.605; R^2 = 5.873%; I^2 = 99.224%[b]				
year_since_pub				26
Estimate	0.015	-0.004	0.034	26
ME Model: τ^2 = 0.035; Q = 606.824; R^2 = 5.821%; I^2 = 98.726%[b]				
ct_verification_SS				26
No verification; not reported; Other	Reference	Reference	Reference	12
School enrolment/attendance; Health attendance	0.099	-0.061	0.259	14
ME Model: τ^2 = 0.035; Q = 1220.529; R^2 = 5.071%; I^2 = 98.199%[b]				
ct_enforcement_SS				26

Moderator	SMD[c]	95% LB[d]	95% UB[e]	N
Attendance/Enrollment/Other	Reference	Reference	Reference	10
No enforcement/ Not reported/NA	-0.111	-0.276	0.054	16
ME Model: τ^2 = 0.036; Q = 1231.386; R^2 = 2.926%; I^2 = 98.249%[b]				
ct_time_limit_SS				26
No/Not reported/NA	Reference	Reference	Reference	15
Yes	0.095	-0.075	0.265	11
ME Model: τ^2 = 0.036; Q = 885.601; R^2 = 2.878%; I^2 = 97.973%[b]				
int_setting_raw				24
Primary/elementary school	Reference	Reference	Reference	10
Secondary/High school	-0.144	-0.323	0.034	14
ME Model: τ^2 = 0.040; Q = 1168.368; R^2 = 2.397%; I^2 = 98.486%[b]				
ct_monitoring_SS				26
No monitoring/ not reported/ Other	Reference	Reference	Reference	12
School enrolment/attendance	0.08	-0.082	0.242	14
ME Model: τ^2 = 0.037; Q = 1243.367; R^2 = 1.930%; I^2 = 98.267%[b]				
ct_transfer_limit_SS				26
No/Not reported	Reference	Reference	Reference	16
Yes	0.089	-0.078	0.255	10
ME Model: τ^2 = 0.037; Q = 970.098; R^2 = 1.341%; I^2 = 98.145%[b]				
Effect size				25
Post-test adjusted	Reference	Reference	Reference	17
Post-test unadjusted	-0.009	-0.126	0.108	8
ME Model: τ^2 = 0.013; Q = 391.898; R^2 = 0.000%; I^2 = 94.550%[b]				
Analysed sample				26
More than median (3474.5)	Reference	Reference	Reference	13
Up to median (3474.5)	-0.062	-0.228	0.105	13
ME Model: τ^2 = 0.038; Q = 1119.934; R^2 = 0.000%; I^2 = 99.372%[b]				
loc_country_raw				23
High/Middle income	Reference	Reference	Reference	18
Low income	0.07	-0.155	0.294	5
ME Model: τ^2 = 0.042; Q = 1275.801; R^2 = 0.000%; I^2 = 99.498%[b]				
int_desig_raw				25
RCT	Reference	Reference	Reference	14
QED	0.018	-0.158	0.193	11
ME Model: τ^2 = 0.041; Q = 1090.452; R^2 = 0.000%; I^2 = 98.379%[b]				
int_who_raw				26
Class teachers	Reference	Reference	Reference	9
Unclear/ Not specified	0.02	-0.158	0.197	17

Moderator	SMD[c]	95% LB[d]	95% UB[e]	N
ME Model: τ^2 = 0.040; Q = 727.289; R^2 = 0.000%; I^2 = 99.311%[b]				
Intervention duration				21
More than median (104)	Reference	Reference	Reference	9
Up to median (104)	-0.038	-0.241	0.166	12
ME Model: τ^2 = 0.047; Q = 889.329; R^2 = 0.000%; I^2 = 99.498%[b]				
Intervention frequency				20
Less than median (0.25)	Reference	Reference	Reference	9
Median or more (0.25)	-0.043	-0.243	0.156	11
ME Model: τ^2 = 0.043; Q = 1085.497; R^2 = 0.000%; I^2 = 99.560%[b]				
ct_eligibility_SS				26
All others	Reference	Reference	Reference	13
Household income	-0.038	-0.205	0.129	13
ME Model: τ^2 = 0.039; Q = 1128.496; R^2 = 0.000%; I^2 = 99.314%[b]				
ct_means_tested_SS				26
No/Not reported/NA	Reference	Reference	Reference	12
Yes	-0.05	-0.218	0.117	14
ME Model: τ^2 = 0.039; Q = 1131.148; R^2 = 0.000%; I^2 = 99.306%[b]				
ct_min_attend_req_SS				26
No/Not reported/NA	Reference	Reference	Reference	13
Yes	-0.085	-0.249	0.079	13
ME Model: τ^2 = 0.037; Q = 806.344; R^2 = 0.000%; I^2 = 99.319%[b]				
ct_perc_attend_req_SS				26
80% and above	Reference	Reference	Reference	13
Not reported/NA	0.085	-0.079	0.249	13
ME Model: τ^2 = 0.037; Q = 806.344; R^2 = 0.000%; I^2 = 99.319%[b]				
ct_prog_type_SS				26
Conditional: Type 3, 4, 5, 6	Reference	Reference	Reference	18
Unconditional: Type 0, 1, 2, 7	0.033	-0.145	0.211	8
ME Model: τ^2 = 0.039; Q = 1146.903; R^2 = 0.000%; I^2 = 99.327%[b]				
int_training_raw				26
No	Reference	Reference	Reference	20
Unclear/ Not specified	-0.056	-0.252	0.14	6
ME Model: τ^2 = 0.038; Q = 1160.443; R^2 = 0.000%; I^2 = 99.372%[b]				

[a]RE: Random effect

[b]ME: Mixed effect

[c]SMD:Standardised mean difference

[d]LB: Lower Bound

[e]UB: upper Bound

Analysis with the most important moderators

In this phase of the analysis, moderators are selected from n available moderators (26 in this report). From n moderators, there are $2^n - 1$ possible combinations. So, this procedure performs the total of 2^n models including an empty model. Then, the performance of each of the fitted models is assessed based on heterogeneity statistics I-squared. The best model is a model with the smallest I-squared. To account for the number of parameters in the model, the optimal model was selected based on adjusted I-squared. The adjusted I-squared was generated by adding the model I-square with the same penalty term ($\frac{2P(P+1)}{N-P-1}$) used in the calculation of AICc from AIC (Akaike information criterion) (Wagenmakers and Farrell (2004)). Moderators with more than 30% of missing data were removed from the following analysis.

This phase of the analysis contains the best models, selected according to four different approaches. Any variable with more than 30% missing values was not included in this the variables selection process.

The best model in the following table was selected based on the AICc (Wagenmakers and Farrell 2004). These criteria select a model with covariates.

The best model in the following table was selected based on its contribution to reducing heterogeneity. That is a model with the highest R-square. This R-square statistics can be obtained as follows:

$$R^2 = 100 * \frac{\tau_{red} - \tau_{full}}{\tau_{red}}$$

Where τ_{full} and τ_{red} indicate model with and model without covariates respectively.

The best model below is defined as a model with the lowest I-squared independent of its number of covariates (or number of parameters).

Lastly, the optimal model selected based on the smallest I-square adjusted to account for the number of parameters or to reduce the effects of overfitting.

Overall Summary

The following table shows the overall summary of all analysis performed above. The best model was considered as the optimal model.

Table 22. Overall summary of cash transfer meta-analysis

	Frequency (N)	SMD [95% CI]	I-squared
Descriptives			
Studies	26		
Participants	603701		
Countries	14		
FSM	19		
Digital Technology	0		
Main/Primary Toolkit outcome RE model			
Overall	26	0.086 [0.004, 0.168]	99.348%
Primary	10	0.150 [0.054, 0.247]	96.640%
Secondary	14	0.013 [-0.123, 0.150]	98.945%
Overall outcome RE model			
Reading	9	0.088 [-0.009, 0.186]	90.964%
Mathematics	10	-0.114 [-0.344, 0.116]	99.203%
Science	1	0.020 [-0.024, 0.065]	0.000%
Heterogeneity			
RE model2[a]	26	I-squared = 99.348	
Best fit model		I-squared =NA% and R-squared =NA%	
Reduction in I-squared		NA%	

[a]RE model2: model without covariates (RE model), using the same studies as in the optimal model

Discussion

Upon reviewing studies of cash transfers, it is apparent that there are several different approaches to cash transfer payment including the use of conditional or unconditional transfers, monitoring and enforcement of transfer conditions and use of eligibility assessments to determine the allocation and amount of financial assistance received. Common characteristics of cash transfer programs may include:

- **Eligibility determined by household income or location**
- **Transfer recipient is typically the head of the household, usually the mother, although may sometimes be given directly to the student**
- **Transfer amount may vary by household income, gender and/or age of student and number of siblings. In addition, bonuses may be awarded for adherence to transfer conditions or continued enrolment in school or the cash transfer program**
- **Transfer payment may depend on meeting conditions such as regular attendance at school or health clinics, achieving 'good' grades or promotion to the next grade**
- **Transfer duration may be limited to a set period of time or until completion of secondary education. In addition, recipient eligibility may fluctuate due to failure to meet transfer conditions or changes in household income.**

The impact of cash transfers on educational attainment is, on average, low (+1 month additional progress). Effects are slightly higher for children in primary schools (+2 months' additional progress). Conditional transfers or approaches where enrolment or attendance is monitored tend to be more effective (+ 2 months). The positive attainment effect was not observed for Maths or Science outcomes, but largely applied to Language scores. This is somewhat similar to the meta-analysis conducted by Baird et al., (2014), which reported no significant effect on Maths and Language test scores.

There are some concerns that cash transfers may be misused by adults within the household, particularly when conditions such as regular school attendance is not monitored or enforced. When transfers are conditional upon pupil attendance, which is subject to monitoring or enforcement, there appears to be a greater impact on pupil outcomes (an additional month's progress). Attaching additional health conditions to the transfer (such as attending a clinic) are also associated with higher impact (+2 months). As a result, it is crucial that programs that award cash transfers to households also monitor/enforce pupil attendance at school to mitigate the risk of transfers being misused or misappropriated.

If schools' principal concern is increasing pupil attainment, then they might consider other, more cost effective ways to improve pupil attainment, though lower attaining pupils do tend to benefit more. Thus, this review echoes the findings of Fernald, Gertler & Neufeld (2009) in reporting that there is some evidence that cash transfers may have a positive but small effect on attainment. Only 26 studies were included in the meta-

analysis, and as a result, there is currently limited evidence to ascertain whether cash transfers can improve educational attainment.

Studies are typically conducted in LMIC countries, where these programs are most prevalent. There were 15 countries identified as the setting for studies included in this analysis; with the majority of studies undertaken in Latin America & Caribbean (n=10). 4 studies were undertaken in Sub-Saharan Africa (Uganda, Malawi) and 1 in the Middle East & North Africa (Morocco).

Given that the primary outcome of cash transfer programs is usually increasing pupil attendance, with pupil attainment a secondary outcome as a result of this increase, analysis was also conducted to determine the impact of cash transfers on pupil attendance. Despite the prevalence of reporting on educational outcomes such as attendance and enrolment, the effect of cash transfers on attendance is also small, with an approximate 15% increase (+0.11).

In sum, approaches which simply assume that the provision of a cash transfer without monitoring or enforcing attendance will increase pupil attendance and attainment at school are not well supported by existing evidence.

Menstrual hygiene interventions

Definition

Menstrual Hygiene Management (MHM) interventions are designed to improve knowledge or management of menstruation. Typically, interventions are divided into two categories (hardware or software) but these approaches are often combined. There has also been a more recent focus on providing WASH facilities that are 'girl-friendly' spaces; safe, secure and private environments to encourage usage.

Hardware interventions refer to the provision of materials (e.g. absorbents, underwear) or improvement of facilities (e.g. WASH, 'girl-friendly' spaces) to manage menstruation. Absorbents can be commercial (bought pre-made from a supplier) or home-made, disposable or reusable. WASH interventions may include increasing the number of available toilets, providing clean water, washing or disposal facilities. 'Girl-friendly' interventions may include provision of single-sex toilets, locks on toilet doors, lights in toilets etc.
Software interventions refer to educational efforts to teach about menstruation (understanding) and/or how to use menstrual hygiene products (usage). Education can be delivered by either educational or health/social professionals.

Context

Poor menstrual hygiene knowledge and limited access to sanitary pads prevent effective menstrual hygiene management and discourage school attendance (Kansiime et al., 2020; Miiro et al., 2018; Coast, Latoff & Strong, 2019). There have been some efforts across public and private schools in low- and middle-income countries (LMICs) to address needs related to menstrual hygiene management. Yet, to date, assessment of the effectiveness of these interventions has been limited (Sommer et al., 2016).

Objective

The objective of this review is to identify studies of Menstrual Hygiene Management interventions and gather them together in EPPI Reviewer to form a corpus of evidence that can be subject to review to:

- **Report key features/characteristics of MHM interventions**
- **Evaluate the methodological quality of the existing evidence base for MHM interventions**
- **Analyse the effect of MHM interventions on educational attainment and additional outcomes such as attendance, enrolment, completion and drop-out**
- **Assess the extent to which program features can influence educational outcomes and determine the magnitude of this effect**

Research questions

1. What is the average impact of Menstrual Hygiene Management interventions on the educational attainment of pupils?
2. What is the average impact of Menstrual Hygiene Management interventions on pupil attendance?
3. What is the average impact of Menstrual Hygiene Management interventions on pupil enrolment?
4. What is the average impact of Menstrual Hygiene Management interventions on school completion?
5. What is the average impact of Menstrual Hygiene Management interventions on pupil drop-out?
6. Which features of program design moderate the impact of Menstrual Hygiene Management interventions on pupil outcomes?
7. Which type of Menstrual Hygiene Management intervention (hardware, software or combined) is most effective in improving the educational attainment of pupils?
8. How does the global evidence for Menstrual Hygiene Management interventions compare with evidence from Sub-Saharan Africa?

Selection criteria

To be included in the review, studies had to meet the definition of a Menstrual Hygiene Management intervention given by Hennegan (2016): the provision of absorbents or WASH facilities to address material deprivation and/or the provision of education to address deficits in knowledge of menstruation and its management. In addition, the same inclusion criteria as those used for the EEF Evidence Database were used to assess suitability for inclusion in this review. The EEF Evidence Database contains the individual studies used to calculate the effect size estimates for the 32 strands presented in the Toolkit. 10,474 studies are held within the database, with 2,531 of these records being used to calculate an effect for the Toolkit. Studies used to generate effect estimates presented within the Toolkit must meet the inclusion criteria outlined in Table 2. If a study did not record attainment data, but reported on any of the following outcomes, it was also deemed suitable for inclusion:

- Attendance
- Enrolment
- Grade progression
- School completion
- Drop-out

Search

Three separate strategies were used to identify all potentially relevant empirical studies of MHM interventions:

1. Unzipping existing reviews
2. Systematic searching of digital repositories

3. Searching of the EEF Evidence Database

Citation searching or 'pearl growing' (Schlosser et al., 2006) and expert nomination, were not used as an approach for study identification. The use of such approaches on their own, without subsequently adapting the search criteria are likely to increase the risk of publication bias (Higgins, 2018). Instead, these approaches were used as techniques for search-string development to improve the adequacy of search terms (Papaioannou et al., 2010). The reference lists of records derived from initial searches were checked and if key studies identified in reference lists were not captured in the search, then the search string was amended to ensure searches were capturing all relevant records.

'Unzipping' existing reviews

6 reviews were identified as including MHM as an educational intervention of interest or specifically reviewed this approach. The reference lists of these reviews were imported into EPPI Reviewer to identify relevant empirical studies of the approach that could be screened for inclusion in the review.

Systematic searches

Searches were conducted in 7 online repositories/databases to identify relevant empirical studies (FirstSearch, EBSCO, Taylor & Francis, ProQuest, Elsevier, Thomson Reuters, 3ie). Searches were developed around key terms relevant to populations, interventions and outcomes of interest. An example of the key terms that were included in search strings are given below in Table 23. As the functionality of each database varies, a separate search string was developed for each source.

Table 23. Key terms for populations, interventions and outcomes relevant for the MHM review

Populations	*Interventions*	*Outcomes*
School OR College OR Educational w institution OR Learning w environment OR Educational w setting OR Learning w setting	Menstruation OR Period OR Menstrual w cycle OR Menses OR Catamenia OR Menarche OR Menstrual w Hygiene OR Menstrual w Hygiene w Management OR MHM OR Sanitary w Pads OR Menstrual w cups OR Sanitary w cups OR Reusable w pads	Attendance OR Presence OR Enrolment OR Admission OR Entrance OR Acceptance OR Absenteeism OR Attainment OR Achievement OR Completion OR Dropout OR Performance

Searching for 'grey' literature (reports and unpublished studies) was also undertaken using Google Scholar. The first 200 results in Google Scholar were imported into EPPI Reviewer, in line with the recommendation of Haddaway et al., (2015).

EEF Evidence Database search

Records of individual studies contained within the EEF Evidence Database were also searched to identify relevant studies. 1 study was identified as potentially relevant for the review and imported into EPPI Reviewer.

Once records had been identified via searches, these were imported into EPPI Reviewer, an online systematic review application. Duplicate records were removed, and remaining items were screened using inclusion criteria to assess suitability for inclusion based on title and abstract and then full text. As a result of these searches 2,326 individual records were imported into EPPI Reviewer, with 1,817 remaining after de-duplication. 104 records were identified as potentially relevant based on title and abstract screening, with 12 remaining after screening the full-text. The searching and screening process is depicted in Figure 16.

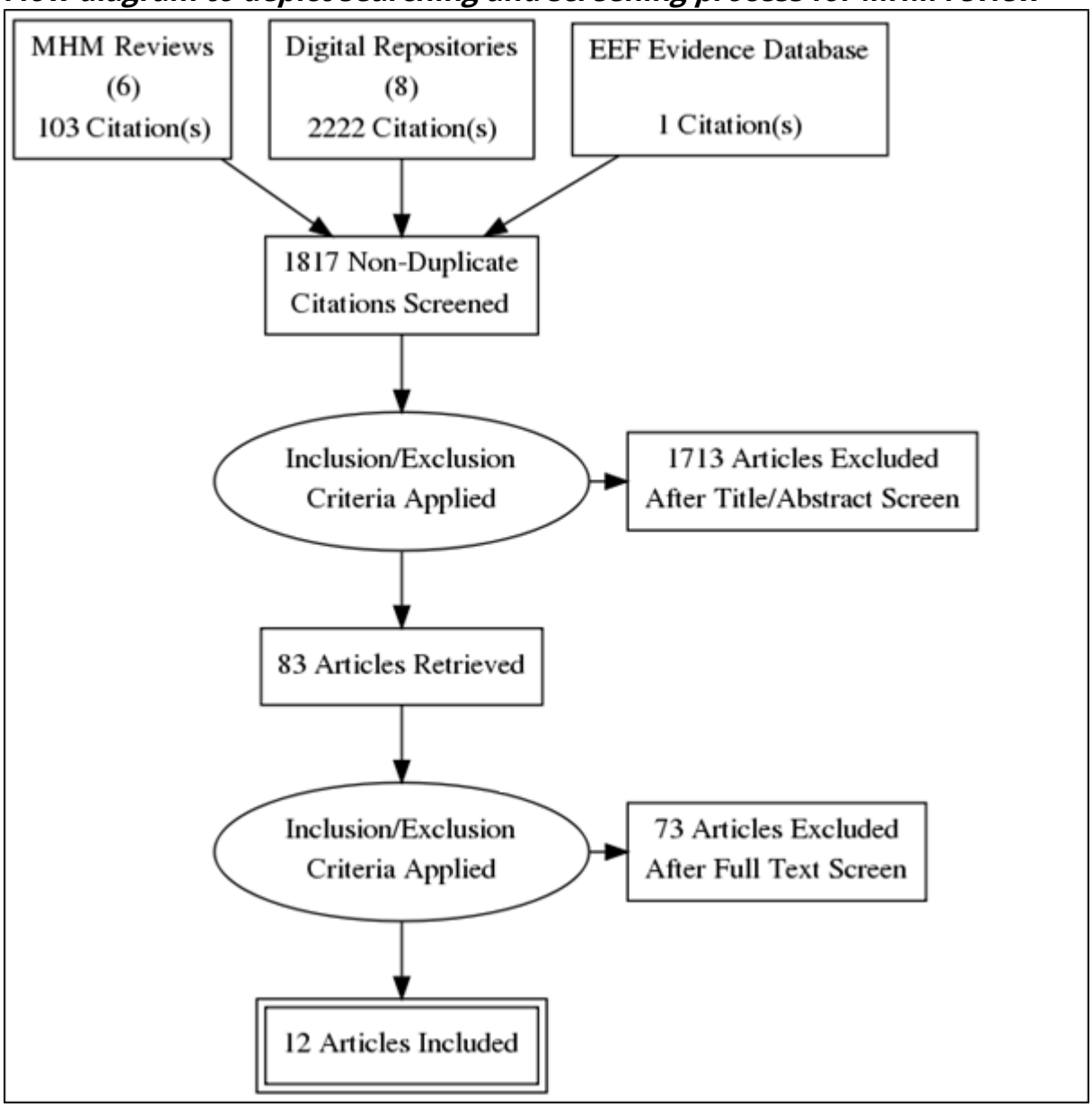
The most common reasons for exclusion during full text screening were intervention or approach (45), outcome (18), language and comparison (8). Disagreements were flagged in the coding software and were discussed and then reconciled by coders.

Data collection

Once studies had been identified as suitable for inclusion in the cash transfer review, they were allocated to a team of coders who used 4 'codesets' to extract relevant data.

1. **EEF Evidence Database Main Data Extraction Tool**
2. **EEF Evidence Database Effect Size Data Extraction Tool**
3. **Additional Educational Outcomes Data Extraction Tool**
4. **Menstrual Hygiene Management Specific Data Extraction Tool**

Figure 16
Flow diagram to depict searching and screening process for MHM review



Two of these codesets (EEF Evidence Database Main Data Extraction Tool and EEF Evidence Database Effect Size Data Extraction Tool) are used to extract information on study design and outcomes for studies contained within the EEF Evidence Database. An additional two code sets (Additional Educational Outcomes Data Extraction Tool and MHM Specific Data Extraction Tool) were created for the purposes of this review in order to capture effects for additional educational outcomes (e.g. attendance, enrolment) that are not currently captured in the EEF Evidence Database and record features of MHM interventions that may mediate program effects.

Menstrual Hygiene Management Specific Data Extraction Tool

Strand specific codes for the Menstrual Hygiene Management Review were determined a-priori through reviewing definitions and program theories of MHM interventions as reported in reviews and meta-analyses of the approach and identifying key features of

MHM interventions described in existing reviews/meta-analyses of the approach (Hennegan, 2016; Mensch, 2017; Sumpter, 2013; Petrosino, 2012; Birdthistle, 2011; Jasper, 2012).

All coding activities were carried out by a team of reviewers, each working independently but discussing and resolving queries, and when necessary, eliciting a third opinion from the core project team. All coders received training and had to achieve an agreed level of reliability to be included in the coding team. A 10% sample of studies (per coder and per strand) are double coded to ensure reliability.

Data synthesis

The aim of this review is to identify and summarize quantifiable school attainment and other educational outcomes from primary empirical studies which meet the inclusion criteria and match the definition of a menstrual hygiene management intervention.

To calculate an average effect for these interventions, the Standardised Mean Difference (d-index) or effect size was used as the key metric. For studies that reported descriptive statistics for continuous measures of pupil outcomes, the post-intervention mean of the control group was subtracted from the post-intervention mean of the intervention group and the resulting difference divided by the pooled standard deviation, adjusted for sample size (Hedges' g). An accompanying standard error (representing the 95% confidence interval) was also recorded. Wherever possible, descriptive outcome statistics (N, means and standard deviations for control and intervention groups) were collected, even when the study report reported an effect size and accompanying standard error, or where an effect size could be calculated from other inferential statistics.

All effect sizes were coded as either resulting from a post-test or gain comparison. These effect sizes were meta-analysed separately as they may represent different metrics (such as when the intervention affects the relative spread of the intervention group) (Xiao, Higgins & Kasim, 2017). For studies where there was a substantial baseline imbalance, a gain score effect size was selected (such as in quasi-experimental designs or natural experiments).

Outcome data however, was reported in a variety of formats. For studies that reported inferential statistics such as t, F, or p-values only, the appropriate conversion formula was applied to calculate the d-index as the effect size estimate (Hedges & Olkin, 1985; Lipsey & Wilson, 2001; Hedges, Shymansky & Woodworth, 1989). To ensure appropriate corrections for the small sample size bias, all d-indices were converted to the unbiased Hedges' g statistic.

After data checking and cleaning, this was data was used to conduct a meta-analysis of included studies. Independent effect sizes were aggregated across studies using a random effects model (Borenstein et al., 2010) as the assumptions for applying a fixed effect model will not be met (i.e. conceptual similarity of the interventions and approaches in each strand or a sample constituting the complete population of relevant studies). The results from a random effects model analysis also perhaps best represent

the overall effect of a collection of educational interventions and approaches across different age groups, school subjects and educational contexts.

A series of analyses were undertaken to check aggregation of effect sizes across studies, sensitivity analyses (see below) and to replicate moderator analyses, using Comprehensive MetaAnalysis 3.0.32 A random effects model was adopted for each meta-analysis and the heterogeneity of the distribution of the effect sizes assessed using Q33 and I234. Study features coded using the menstrual hygiene management specific codeset were further explored through moderator variable analysis under a mixed effects model, as potential sources of systematic variation.

To assess potential bias associated with individual out-of-range calculated effect sizes which may potentially distort the overall interpretation of the findings, a sensitivity analysis was undertaken (Hedges & Olkin, 1985). This was to determine whether the removal of a particular effect size increases the fit of the remaining effect sizes in a homogeneous distribution while not substantially affecting the interpretation of the recalculated mean effect size. Various approaches to identifying potential outliers were used, including visual examination of data organized into a forest plots and also performing "one study removed" (Baker, & Jackson, 2008). Identified outliers were examined with the potential to remove them from the final dataset. Potential sources of bias, such as study design, type of treatment, publication source, missing data, sample size, or attrition, were carefully examined through the corresponding moderator variable analyses.

Relying on available and published studies may bias or inflate the overall intervention effect, particularly in education with a relatively large proportion of smaller studies. To evaluate potential publication bias across the database, the association between publication type and the pooled effect (i.e. journal article, dissertation or thesis, technical report, book or book chapter, conference paper, and other) was reviewed. Thesis completion is not usually influenced by the size of the effect, unlike journal articles. Other methods for assessing publication bias were utilised, such as a visual inspection of a funnel plot or Duval & Tweedie's (2000) trim and fill routine available in Comprehensive Meta-Analysis (CMA)37 (Borenstein et al., 2005). Becker (2005) and Banks et al. (2012), however, recommend the discontinuation of the use of the failsafe N to assess publication bias, as the results are often inconsistent with the results from other publication bias methods. In education all of the methods to detect publication bias are problematic due to the negative association between sample size and effect size (Slavin & Madden, 2011).

Results

Of 12 studies meeting the inclusion criteria, 1 reported attainment data. The majority (n=6, 50%) report attendance data, this was subject to analysis. The following table shows the number of available and missing studies in each outcome.

Table 23: Number of available and missing studies per outcome for MHM review

SMD	SE	Available studies	Missing
smd_attend	se_attend	6	6
smd_other_outcome	se_other_outcome	3	9
smd_abs	se_abs	2	10
smd_dropout	se_dropout	1	11
smd_schl_enrol	se_schl_enrol	0	12
smd_ret_ed	se_ret_ed	0	12
smd_time_schl	se_time_schl	0	12
smd_ret	se_ret	0	12
smd_grad_comp	se_grad_comp	0	12
smd_school_comp	se_school_comp	0	12
smd_next_grade	se_next_grade	0	12
smd_grade_rep	se_grade_rep	0	12

Outcomewise random effect meta-analysis

Subgroup and mixed effect meta-regression (analysis with moderators) were not performed. It contains only random effect meta-analysis without moderators for each of the five highlighted outcomes. The remaining outcomes were not considered due to the small number of available studies.

Attendance outcome (available studies: 6)

Table 24. Attendance outcomes for MHM analysis

Author (Year)	Effect size (SMD)[a]	Standard error[b]	95% LB[c]	95% UB[d]	Weight	SMD [95% CI]
Oster (2009)	0.077	0.035	0.008	0.146	53.034	0.077 [0.008, 0.146]
Dolan (2014) 1_1	0.675	0.27	0.147	1.203	0.898	0.675 [0.147, 1.203]
Dolan (2014) 1_2	0.499	0.216	0.076	0.922	1.398	0.499 [0.076, 0.922]
Montgomery (2016)	0.097	0.139	-0.175	0.37	3.369	0.097 [-0.175, 0.370]
Austrian (2020) 1_1	0.062	0.056	-0.048	0.173	20.467	0.062 [-0.048, 0.173]
Austrian (2020) 1_3	0.095	0.056	-0.014	0.205	20.835	0.095 [-0.014, 0.205]
RE Model: Q = 8.684; τ^2 = 0.000; I^2 = 0.083%						**0.090 [0.040, 0.140]**

[a]SMD:Standardised mean difference
[b]LB: Lower Bound
[c]UB: upper Bound
[d]CI: Confidence Interval

Discussion

There is a lack of evidence to determine the effect of menstrual hygiene management programs on attainment outcomes. Of 12 studies meeting the inclusion criteria, 1 reported attainment data. The majority (n=6, 50%) report attendance data and these were subject to analysis in this review.

The impact of menstrual hygiene management programs on pupil attendance is (+0.090). This is low impact based on very limited evidence. The results of rigorous evaluations, such as those with experimental trials or with well-controlled groups, suggest that the average impact of menstrual hygiene management programs on attendance has typically been low. Whilst impact on attendance is generally positive, there is a lack of evidence to determine whether effects are mediated by intervention type or the effect on additional outcomes such as enrolment, absence, drop-out and grade repetition/progression.

All evaluations of menstrual hygiene management programs included in this review are conducted in Low and Middle Income countries (LMICs). There is a lack of evidence regarding their use and effectiveness in High Income Countries. There were 4 countries as the setting for studies included in this analysis, with the majority of studies undertaken in Sub-Saharan Africa (Kenya, Ghana, Uganda) and 2 studies undertaken in Nepal.

None of the included studies reported cost data so it is difficult to estimate the associated costs of menstrual hygiene management interventions. Wider studies exploring interventions using different research approaches may need to be consulted in future to gain a more accurate understanding of the cost of these programmes. This is important as costs will vary depending on which approach to menstrual hygiene management is being utilised.

There are several different approaches to menstrual hygiene management including the use of hardware or software interventions, and the inclusion of WASH components and/or girl-friendly facilities. Common characteristics of software interventions may include:

- **One-off or regular educational sessions**
- **Education on the menstrual cycle and hygiene (understanding)**
- **Education/demonstrations on how to make and/or use menstrual hygiene products (usage)**
- **Education delivered by teachers, peers, nurses, midwives or other social/health workers to students (female only or mixed sex groups) and sometimes their mothers or other women in the community**
- **Training and professional development for teachers may be included in interventions**
- **Education may also be delivered via print or electronic media**

Common characteristics of hardware interventions may include:

- **A material component where commercial sanitary products (underwear or absorbents such as disposable sanitary pads or reusable cups/pads) or materials and instructions to make homemade sanitary products are provided**
- **A WASH component to improve sanitation and existing facilities at schools through increasing number of toilets or provision of menstrual hygiene products, soap/disinfectant, clean water, handwashing facilities, absorbent washing facilities and absorbent disposal facilities**
- **A 'girl-friendly' component to encourage use of facilities such as single-sex toilets, toilets with doors, lockable toilets, and toilets with lighting**
- **Provision of a calendar and pencil to track menstrual cycle**
- **Cash transfer component to support the purchase of sanitary products**

Corporal punishment

Definition

Corporal punishment is defined as using physical force with the intention of causing a child to experience pain, but not injury, in order to correct or control the child's behaviour (Straus & Donnelly, 2005). Punishment can include the use of sticks, whips, belts and other objects, boxing of ears and enforcing uncomfortable positions such as kneeling or sitting on an imaginary chair.

Corporal punishment can be used to punish poor academic performance or bad conduct, but in some cases, it may be used for no clear reason (Antonowicz, 2010). The emphasis on "pain but not injury" distinguishes corporal punishment from physical abuse. Within the context of this definition, corporal punishment is considered socially acceptable in many countries across the African continent (Straus & Donnelly, 2005).

Context

The international community has outlined various measures to limit or completely eliminate the use of corporal punishment of children in all spheres. Article 19 of the United Nations Convention on the Rights of the Child requires states to protect children from all forms of physical or emotional violence, injury or abuse by any persons in any setting. Article 28 of this Convention further calls on states to take all appropriate measures to ensure that the administering of discipline in schools is consistent with the child's human dignity (UN General Assembly, 1989).

Likewise, the African Charter on the Rights and Welfare of the Child recommends that children subjected to school or parental discipline be treated with humanity and with respect for their inherent dignity (Article 11). The Charter, in Article 16, also requires states to protect children from all forms of torture, inhumane or degrading treatment especially physical or mental injury or abuse (African Union, 1990). This call to end the use of corporal punishment was re-iterated in the 2030 Agenda for Sustainable Development.

Despite the commitments made by states to eliminate the practice of corporal punishment, it is still widely practiced in the school milieu. Statistics from the Global Initiative to End All Corporal Punishment of Children (GIEACPC) indicate that globally, Africa is home to about 40% of countries in which corporal punishment within the educational setting is permitted (GIEACPC, Save the Children Sweden, 2017). There is a high prevalence rate of corporal punishment in Sub-Saharan African countries (SSA) as physical and emotional violence inflicted on students by teachers has not been completely outlawed in over 27 countries (GIEACPC, 2018). Gershoff (2017) notes that violent punishment rates in 22 African countries (of which corporal punishment is permitted in 12) range from 98% among boys and 91% among girls in Tanzania, to 28% of students in Djibouti. In West and Central Africa, studies from Benin, Senegal, Central African Republic and The Gambia reveal that more than half of primary school children have experienced corporal punishment in schools (Antonowicz, 2010).

It has been suggested that the continuing use of corporal punishment within the school setting in SSA can be explained by societal norms and beliefs, the recruitment of unqualified teachers and a lack of teacher training (Antonowicz, 2010). Regarding societal norms, SSA is characterised by the principles of conformity and submission of children to the will of the families which is sometimes transferred to the classrooms. Corporal punishment is used as a means of correction when children fail to comply with the will of the teachers and school authorities. Furthermore, the recruitment of under-qualified and untrained volunteer teachers by local communities can eventually create a teaching force with inadequate skills on class management and instilling discipline (Antonowicz, 2010). As a corollary, teachers are unaware of alternative non-violent discipline management strategies that are effective in managing student behaviours (Mweru, 2010). Ssenyonga, Hermenau, Nkuba, & Hecker (2018) also attribute the use of corporal punishment in schools to a failure to implement and enforce regulations. Although the use of corporal punishment has been prohibited, no available alternative disciplinary measures have been prescribed for use in schools, hence, teachers continue to rely on the use of corporal punishment.

Almost all studies on corporal punishment in both High and Low and Middle Income countries report that this practice has negative short-and long-term effects on the psychological and social development of students, and improves neither learning nor discipline (Antonowicz, 2010). A study by Hecker, Hermenau, Isele, & Elbert (2013) report a negative relationship between corporal punishment and prosocial behaviour and a positive relationship between corporal punishment and lifetime aggressive behaviour, conduct problems and hyperactivity. Despite arguments to the contrary, the use of corporal punishment may lead to low educational attainment because it is correlated with high school drop-out and absenteeism rates, low self-esteem, and limited communication in school (Ssenyonga, Hermenau, Nkuba, & Hecker, 2018).

Despite reports of the negative effects of corporal punishment on pupils, teachers and students often believe that corporal punishment is necessary and effective. A study in Kenya, for example, found that the majority of teachers, school authorities and students agreed that the ban against corporal punishment should be repealed (Mweru, 2010). Likewise, from an educational stakeholder meeting organised by eBASE Africa in Yaoundé - Cameroon, there was a general perception of corporal punishment being accepted in the education milieu. This was also supported and encouraged by parents. Most stakeholders voiced the belief that there was a need to reinstate this behaviour management technique within schools and teachers argued that they had experienced corporal punishment whilst studying at school and found it to be effective.

In Sub-Saharan Africa, rigorously evaluated alternative interventions to corporal punishment are lacking. A limited number of interventions have been subject to evaluation, such as the *Good Schools Toolkit* in Uganda and the *Interaction Competencies with Children for Teachers* (ICC-T) in Tanzania (which were implemented as cluster randomised control trials). These both report positive changes in teachers' attitudes towards the use of corporal punishment and a reduction in the use of corporal punishment as reported by students (Nkuba, Hermenau, Goessmann, & Hecker, 2018). These interventions do not report on outcomes related to pupil attainment; thus it is difficult to understand the effect of a reduction in corporal punishment on pupil

learning. The behaviour intervention strand of the EEF Toolkit reports overall moderate improvements in students' academic performance when exposed to an intervention aimed at improving behaviour. These interventions typically focus on reducing challenging behaviours in students/learners, including developing a positive school ethos or improve discipline across the whole school, improving behaviour particularly in the classroom, and targeting students with particular behavioural issues; currently there are no corporal punishment studies informing this strand. As a result, this review seeks to determine the average effect of corporal punishment on learning outcomes for primary and secondary school pupils in Sub-Saharan Africa. It shall examine the different forms of corporal punishment practiced in Sub-Saharan Africa, and how these may vary in their influence on educational attainment. The review also considers alternative approaches to corporal punishment in Sub-Saharan Africa, and the effect of these on educational attainment.

Objective

The objective of this review is to identify studies of corporal punishment and gather them together in EPPI Reviewer to form a corpus of evidence that can be subject to review to:

- **Report key features/characteristics of approaches to corporal punishment**
- **Evaluate the methodological quality of the existing evidence base for approaches to corporal punishment**
- **Analyse the effect of approaches to corporal punishment on educational attainment and additional outcomes such as attendance, enrolment, completion and drop-out**
- **Assess the extent to which different approaches can influence educational outcomes and determine the magnitude of this effect**

Research Questions

1. **What is the impact of corporal punishment on the educational attainment of pupils?**
2. **What is the impact of corporal punishment on pupil attendance?**
3. **What is the impact of corporal punishment on pupil enrolment?**
4. **What is the impact of corporal punishment on school completion?**
5. **What is the impact of corporal punishment on pupil drop-out?**
6. **Which features moderate the impact of corporal punishment on pupil attainment outcomes?**
7. **How does the global evidence for corporal punishment compare with evidence from Sub-Saharan Africa?**
8. **What are some of the alternatives to corporal punishment?**

Selection criteria

To be included in the review, studies had to meet the definition of corporal punishment given by Straus & Donnelly (2005): the use of physical force with the intention of causing a child to experience pain, but not injury, in order to correct or control the child's behaviour. Punishment could include the use of sticks, whips, belts and other objects,

boxing of ears and enforcing uncomfortable positions such as kneeling or sitting on an imaginary chair. In addition, the same inclusion criteria as those included in the EEF Evidence Database were used to assess suitability for inclusion in the review. The EEF Evidence Database contains the individual studies used to calculate the effect size estimates for the 32 strands presented in the Toolkit. 10,474 studies are held within the database, with 2,531 of these records being used to calculate an effect for the Toolkit. Studies used to generate effect estimates presented within the Toolkit must meet the inclusion criteria outlined in Table 2. If a study did not record attainment data, but reported on any of the following outcomes, it was also deemed suitable for inclusion:

- Attendance
- Enrolment
- Grade progression
- School completion
- Drop-out

Search

Three separate strategies were used to identify all potentially relevant empirical studies of corporal punishment:

1. Unzipping existing reviews
2. Systematic searching of digital repositories
3. Searching of the EEF Evidence Database

Citation searching or 'pearl growing' (Schlosser et al., 2006) and expert nomination, were not used as an approach for study identification. The use of such approaches on their own, without subsequently adapting the search criteria are likely to increase the risk of publication bias (Higgins, 2018). Instead, these approaches were used as techniques for search-string development to improve the adequacy of search terms (Papaioannou et al., 2010). The reference lists of records derived from initial searches were checked and if key studies identified in reference lists were not captured in the search, then the search string was amended to ensure searches were capturing all relevant records.

'Unzipping' existing reviews

8 reviews were identified as including corporal punishment as an educational intervention of interest or specifically reviewed this approach. The reference lists of these reviews were reviewed to identify relevant empirical studies of the approach that could be screened for inclusion in the review. Each of the reviews relied on longitudinal/correlational studies and as a result, no references were imported from these sources into EPPI Reviewer.

Systematic searches

Searches were conducted in 7 online repositories/databases to identify relevant empirical studies. Searches were developed around key terms relevant to populations, interventions and outcomes of interest. An example of the key terms that were included in search strings are given below in Table 25. As the functionality of each database varies, a separate search string was developed for each source.

Table 25. Key terms for populations, interventions and outcomes relevant for the corporal punishment review

Populations	*Interventions*	*Outcomes*
school OR secondary school OR kindergarten OR pre-primary OR preschool OR nursery school OR classroom OR community	corporal punishment OR anti bullying OR beating OR kneeling OR slapping OR spanking OR juvenile delinquency OR whipping OR behaviour intervention OR discipline OR dubbing OR trouncing	attainment OR achievement OR "academic achievement" impact OR "test score" OR performance OR enrol* OR attendance OR "school completion" OR dropout OR drop-out

Searching for 'grey' literature (reports and unpublished studies) was also undertaken using Google Scholar. The first 200 results in Google Scholar were imported into EPPI Reviewer, in line with the recommendation of Haddaway et al., (2015).

EEF Evidence Database search

Records of individual studies contained within the EEF Evidence Database were also searched to identify relevant studies. No studies were identified as potentially relevant for the review.

Once records had been identified via searches, these were imported into EPPI Reviewer, an online systematic review application. Duplicate records were removed and remaining items were screened using inclusion criteria to assess suitability for inclusion based on title and abstract and then full text. As a result of these searches, 2769 were imported into EPPI Reviewer, with 2662 remaining after de-duplication. 111 records were identified as potentially relevant based on title and abstract screening, with 0 remaining after screening the full-text.

12 studies were identified as correlational/longitudinal studies of the effects of corporal punishment on school pupils. Whilst these do not meet the inclusion criteria for the Toolkit, they may provide insight into potential outcomes. As a result, these have been marked as potential studies for further review in future.

Data collection and synthesis

No studies were identified that met the inclusion criteria for the review. It was, therefore, not possible to collect or synthesise data for the review of corporal punishment studies. Twelve studies

Discussion

The stakeholder engagement indicated that, despite being an illegal practice in the target countries, corporal punishment is still the preferred method of behaviour management in many schools. Our review found no evidence around corporal punishment strategies that met the inclusion criteria for the Toolkit.

It is, perhaps, unsurprising that there have been few rigorous studies of the approach, given the ethical considerations of participants in the study and the illegality of the practice in many countries.

It is, however, important to note the contrast between the evidence base for corporal punishment and the much wider evidence base for other approaches to classroom management. Our wider evidence review found positive attainment impacts for classroom management techniques and targeted interventions aimed at improving behaviour. While the evidence base for these approaches is still limited in LMICs – there is clear evidence of promise from the global evidence base for alternative approaches to classroom management. The lack of any evidence for the efficacy of corporal punishment makes the case for learning from these alternative approaches even more compelling.

Future research might aim to implement alternative behaviour approaches in the Chad basin and compare the effectiveness of these approaches to business as usual in the context.

4. Conclusions

Limitations of the project

The project aimed to explore the transferability of approaches from the Teaching and Learning Toolkit to the Chad Basin. The key limitation of the project was the extent of the evidence base in the target countries. Across the grey literature searching, the local evidence reviews and the data from the existing database, limited studies were identified.

The limitations of the evidence meant that very little quantitative analysis could be undertaken to identify where country context explained heterogeneity in the overall meta-analysis.

The limitations are particularly severe for the specific new topic area of corporal punishment, which was requested during stakeholder engagement. A systematic search was able to identify no studies that met the inclusion criteria for the evidence portal once full text screening was complete.

Main results

The main results of each individual systematic review are discussed above. The key findings below focus on the overall objective to explore the transferability of the approaches in the Teaching and Learning Toolkit.

1. **Policymakers and practitioners within the Chad Basin felt that the pedagogical approaches included in the Toolkit were largely appropriate and applicable in their context.**
   While 5 approaches (One to One Tuition, School Uniform, Setting and Streaming, Teaching Assistants' Interventions, and Learning Styles) were considered either too expensive or otherwise infeasible to implement in the context, the other 3 topics (Menstrual Hygiene Interventions, Cash Transfers, and Corporal Punishment) were received enthusiastically by policymakers and school leaders.

2. **Despite the relevance of pedagogical approaches to the Chad Basin, relatively few research studies have examined pedagogical approaches such as feedback or metacognition to improving learning outcomes.**
   The contrast between studies in metacognition, for example, there have been 241 studies that have taken place in high income countries and 12 that have taken place in LMICs. Many promising pedagogical strategies in the Toolkit have never been evaluated in a LMIC context.

3. **There is value in comparing across the studies from high income countries and LMICs.**
   At the beginning of this project the aim was to empirically explore the transferability by comparing whether country income level was a moderator of the variation that sits behind the evidence base for any of the mid-range theories contained within the Toolkit. While the severe limitations of the

evidence base have made that moderator analysis unfeasible, discussions with stakeholders and the cultivation of a shared database have been incredibly valuable. In areas of limited evidence, promising strategies from high income countries might represent best bets for careful recontextualization and evaluation.

Implications for practice

The evidence portal (https://ebaselearning.org/) that has been produced will provide a useful starting point for policymakers and practitioners when considering the global and local evidence of best practice. The 27 topics in the Toolkit each describe the global impact and evidence security for each topic overall, alongside a local evidence review for each topic area that highlights some of the challenges and weaknesses of the evidence base for the Chad Basin (screenshots of the evidence portal are included in Appendix A). The portal communicates the results in plain language and each topic area has been produced using the same methodology, meaning that the results are comparable.

The evidence summaries in the portal, alone, will not change practice in the Chad Basin. As a result, the team at eBASE have already begun to embed the findings from the evidence portal in local support for schools within Cameroon. By combining local practice expertise with the findings from the global evidence base, the aim is to improve teacher practice and ultimately pupil outcomes. As a result of COVID-19, much face to face training has been disrupted, but eBASE Africa have been using an approach called Café Ushaidi to disseminate findings from the portal.

Café Ushaidi is an innovative concept developed by eBASE Africa to disseminate evidence within practitioners in Cameroon and in countries of the lake Chad Basin. Ushaidi means 'Evidence' in Swahili, a very popular African language. The broad concept is about setting up a space where producers and users of evidence can exchange on need and availability of evidence. Due to the COVID-19 pandemic the sessions were organized through WhatsApp Sessions, and eBASE relied on a network of teachers to disseminate the link amongst their peers.

As of February 2022, there are 159 active members. The evidence summaries developed as part of the project are shared by eBASE and discussions are encouraged around the particular topic. During past sessions the following topics were discussed;

- **Parental Involvement**
- **Repeating a school year**
- **Arts Participation**
- **Menstrual Hygiene**
- **Distance Learning**
- **Pay for performance**
- **Behaviour Interventions**
- **Early years Intervention**

The aim in the future is to build on this initial remote network with for face to face dissemination strategies.

Implications for research

Research in LMICs has to this date had limited focus on attainment outcomes and limited focus on pedagogical strategies. Most of the approaches that have been tested – for example studies located in the 3ie development evidence portal – are structural in nature and tend to collect attendance outcomes.

If education is going to move from access to quality, it is imperative that further research is conducted that puts pedagogical theory at the heart of the intervention. Areas that have extensive evidence and promise from high income countries but limited evidence in LMICs include effective feedback strategies for pupils, metacognitive learning approaches, peer tutoring interventions and oral language approaches. All of these interventions are low cost and have extensive evidence of promise across the global evidence base but have not been evaluated extensively in LMICs.

Another gap in the research is around corporal punishment approaches. The ethics of researching corporal punishment mean that we do not recommend any new primary research in the area. The evidence and efficacy of alternative behaviour management strategies should be prioritised instead.

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Annex A: Cash transfers example Toolkit topic

Cash Transfers

Low impact for moderate cost based on limited evidence

Implementation cost: £ £ £ £ £

Evidence strength: 🔒 🔒 🔒 🔒 🔒

Impact (months): +1 months

What is it? | Key findings | How effective is the approach? | Behind the average? | How could you implement in your setting? | What does it › | Technical Appendix

What is it?

Cash transfer programs aim to provide financial assistance to low-income households in order to support school enrolment and/or attendance and as a result, improve pupil's educational attainment outcomes. This evidence summary focuses on the impact of cash transfer programmes on the academic attainment of pupils.

A distinction can be drawn between unconditional cash transfers, where transfers are made regardless of recipients' adherence to prerequisite conditions, and conditional transfers, where transfers are only paid if recipients meet specific requirements such as regular attendance at school or health clinics.

Programs also differ in the amount and regularity of how transfers are made to households. The recipient of the cash transfer can vary between and within programs, with some using 'scales' of eligibility based on household income and/or pupil background, gender, age and number of siblings. Outcomes for pupils receiving transfers also differ. In some programs, attendance is the sole measurement used to determine efficacy, whereas others may monitor and report attainment, enrolment, absence, drop-out, and grade progression or repetition.

Key findings

1. The impact of cash transfers on educational attainment is, on average, low (+1 month). Effects are slightly higher for children in primary schools (+2 months). If schools' principal concern is increasing pupil attainment, then they might consider other, more cost effective ways to improve pupil attainment. There is some evidence that lower attaining pupils tend to receive additional benefits from cash transfers.

2. Conditional transfers or approaches where enrolment or attendance is monitored tend to be more effective (+2 months). Attaching additional health conditions to the transfer (such as attending a clinic) are also associated with higher impact (+2 months).

3. A small positive impact was found on pupil attendance (around 15% higher attendance). The theory of change for cash transfers impacting pupil attainment involves the transfers increasing pupil attendance, which would eventually lead to increases in learning.

How effective is the approach?

The results of rigorous evaluations, such as those with experimental trials or with well-controlled groups, suggest that the average impact of cash transfer programs on educational attainment has typically been small but positive (+1 months' progress). Impact on attendance is generally positive but there is a lack of evidence to determine the effect on additional outcomes such as enrolment, absence, drop-out and grade repetition/progression. Conditional transfers – where recipients have to adhere to prerequisite conditions such as regular attendance at school or health clinics in order to receive a transfer – have shown greater impact, compared with unconditional transfers where there are no conditions attached.

Most evaluations of cash transfer programs are conducted in Low and Middle Income countries (LMICs). There is a lack of evidence regarding their use and effectiveness in High Income Countries (HICs).

There are some concerns that cash transfers may be misused by adults within the household, particularly when conditions such as regular school attendance is not monitored or enforced. When transfers are conditional upon pupil attendance, which is subject to monitoring or enforcement, there appears to be a greater impact on pupil outcomes.

Behind the average?

Overall, there appears to be a higher impact of cash transfers on attainment at primary school level (children aged between four-11 years).

Effects of cash transfers are higher for literacy than for mathematics or science, though the number of studies for comparison is small.

Studies are typically conducted in LMIC countries where these programs are most prevalent. There were 15 countries as the setting for studies included in this analysis, with the majority of studies undertaken in Latin America & Carribbean. Four studies were undertaken in Sub-Saharan Africa (Uganda, Malawi) and one in the Middle East & North Africa (Morocco).

How could you implement in your setting?

There are several different approaches to cash transfer payment including the use of conditional or unconditional transfers, monitoring and enforcement of transfer conditions and use of eligibility assessments to determine the allocation and amount of financial assistance received. Common characteristics of cash transfer programs may include:

- Eligibility determined by household income or location;
- Transfer recipient is typically the head of the household, usually the mother, although may sometimes be given directly to the student;
- Transfer amount may vary by household income, gender and/or age of student and number of siblings. In addition, bonuses may be awarded for adherence to transfer conditions or continued enrolment in school or the cash transfer program;
- Transfer payment may depend on meeting conditions such as regular attendance at school or health clinics, achieving 'good' grades or promotion to the next grade; or
- Transfer duration may be limited to a set period of time or until completion of secondary education. In addition, recipient eligibility may fluctuate due to failure to meet transfer conditions or changes in household income.

It is crucial that programs that award cash transfers to households also monitor/enforce pupil attendance at school to mitigate the risk of transfers being misused or misappropriated.

What does it cost?

Costs associated with cash transfer programs arise from the provision of financial assistance to participating households as well as awarding bonuses to recipients and providing incentives to schools to publicise and encourage program participation, all of which are recurring costs.

The costs of cash transfer programs range from approximately $1 to $200 USD per student per month. This is based on the amount households receive per student, it does not take account of bonuses and incentives. As a result, the overall cost of cash transfer programs may be much higher.

The range in the amount of transfer made to recipients varies widely depending on household income, gender and/or age of student and number of siblings. In addition, bonuses may be awarded for adherence to transfer conditions or continued enrolment in school or the cash transfer program. As a result, the average amount a household may receive per month is highly variable. The amount of transfer will also depend on the country in which the program is active and the associated costs of education in that context.

In Malawi for example, the monthly transfer amount was between $1 and $5 USD, whereas in Mexico, the monthly transfer amount was between $2 and $75 USD. Transfers in HIC contexts were much higher, with an average of $150 USD in the US and $200 USD in the UK.

How secure is the evidence?

The security of the evidence around cash transfers is rated as very limited. 26 studies were identified that meet the inclusion criteria for the Toolkit. The topic lost padlocks because:

- A large percentage of the studies are not randomised controlled trials. While other study designs still give important information about effectiveness of approaches, there is a risk that results are influenced by unknown factors that are not part of the intervention.
- There is a very large amount of unexplained variation between the results included in the topic. All reviews contain some variation in results, which is why it is important to look behind the average. Unexplained variation (or heterogeneity) reduces our certainty in the results in ways that we have been unable to test by looking at how context, methodology or approach is influencing impact.

As with any evidence review, the Toolkit summarises the average impact of approaches when researched in academic studies. It is important to consider your context and apply your professional judgement when implementing an approach in your setting.

Evidence strength

Number of studies

26

Review last updated

September 2021

Annex B: Stakeholder engagement

Date and place of interaction	Name and institution of stakeholder	Details of interaction	Follow-up / next steps
Stakeholders' meeting 06th and 07th March 2020 in Yaoundé	Academic community - Promise Aseh Munteh, Catholic University of Cameroon (CATUC) Bamenda - Akomoneh Elvis, Meridian University/University of Bamenda - Nsagha Sarah Mboshi, University of Bamenda	Engaging with the lecturers and universities in producing and disseminating evidence for improving educational outcomes, identifying priority areas for research and strategies for accessing the grey data of universities	- Creation of a platform for collaboration between the academic community (universities) and civil society organisations - Building of network of lecturers, students and researchers across different universities - Working with some universities in developing a proposal for the global trials (behavioural intervention in Northern Cameroon with the University of Maroua)
	Civil Society Organisations - Lambiv Kelen Wiysanyuy, Competence Bilingual nusery and primary school Meiganga, Adamawa - Ndavoumta Daniel, SAMARIYA - Bakowe Evina Emeline, HeforShe/UN Women	Strategies for collaboration with academic community/universities to ensure that projects that are implemented are based on the best available evidence	- Partnerships with universities - 5 projects have been developed for the Global Trials

Focus Group Discussions (FGDs), 15th and 16th July 2020 in Yaounde	Teachers • Nguetsa Eric O. Ecole spesiale du CNRPH de Yde • Tankoua Bih G.T.C Awing • Nemi Elada Lycee de Ngozo • Nkwenti Dannniela Vocational training institute • Wirba Basile GBHS Nguelebok • Stella Fon Lycee Biyem'Assi • Metouke Olivia Lycee Biyem'Assi	We held 4 teachers FGDs as part of stakeholder's engagement and qualitative (formative) research on pre-conditions for learning. Initially 2 FGDs were planned but due to size and need these groups were split in 2. Groups highlighted the interest in cash transfers, menstrual hygiene interventions and corporal punishment. They also discussed the relevance of the existing topics. Further to these, other topics arose that will require targeted FGDs. These included: 1. Adult learning for parents to support them for parental engagement at home 2. Including indigenous populations in learning 3. Teaching and Learning in fragile communities Influence of colonial heritages on teaching and learning	- Develop more didactic tools to facilitate understanding of using research evidence for teaching and learning. - Develop an approach for audits and feedback for teachers. - Follow up discussions with World Bank on performance-based pay, cash transfers, and community schools (as an approach to support parental engagement). - Additional FGDs on the four topics identified.
FGD and Stakeholders' meeting, 07th and 08th August 2020 in Bamenda	Teachers - Tcheuleu Emilie Saint Briget Nursery and Primary School - Bilum Florence Government	Through the FGDs, we sought to gather the experiences of teachers on the preconditions for learning. Through the stakeholder meeting, we introduced the Toolkit Strands and asked about their preferences, identified new strands, identified	- eBASE act as an Evidence Centre where we provide teachers with answers to relevant questions - eBASE disseminate evidence summaries on specific topics in education to improve on teaching practice

	Technical College Awing - Menkemndi Solomon, - Bainsi Judith Government Bilingual High school Atiela - Beatrice Akwe Afon Tamilo Government Bilingual High school Atiela - Ngwasiri Dickson Government Technical High School ESU - Ndi Euphrasia Cameroon Consumer Service Organisation (CamCoSO)	risks and opportunities, as well as the pathways for toolkit appropriation and sustainability	
	Parents - Pebou Bill, Councillor, Bamenda I council - Azinwi Margaret, Nurse, Integrated health centre Banshie, Ministry of health - Saakhem Gilbert Jima, High court, Ministry of Justice,	Exchange on parents' experiences on the preconditions for learning, toolkit strands, identification of new strands and strategies through which parents can use the toolkit to improve on educational attainment. Parents expressed ideas on how their role could positively and negatively impact children.	- Strategies for parents to support the education of children within the context of armed conflict - Disseminating evidence to improve parental involvement in the education of their children both at school and at home

	Students - Halimatou Adu Government Bilingual High School Bamenda - Songge Paul	Learners expressed ideas on the preconditions for learning, and their perception of the learning environment in school and at home. Likewise, they expressed opinions on the Toolkit strands, their preferences and how this could contribute to improving their learning.	- Encouraging students to adopt learning practices that are proven to work and would contribute to improving their learning outcomes - Targeted Focus Group Discussions with learners who are disabled to acquire in depth knowledge on education for children with disabilities
	Policymakers - Koukeng Tanon Bernadette, Inspectorate of Basic Education Bamenda - Numfor nee Shu Emmanuela Bih, North West Regional Delegation for Secondary Education, - Nkum Oliver Kum, Northwest Regional Delegation for Secondary Education - Akoso Wilfred, Ministry of Higher education, Coordinator of the HND program for the North West Region	Enunciated their opinions on the preconditions for learning, a critical examination of the Toolkit within the policy context of Cameroon (preferences, new strands, risks and opportunities, and appropriation and sustainability)	- eBASE as a Knowledge Brokering Centre to ensure that policies and education strategies are based on high quality evidence - Provide training to policymakers on the use of high-quality research evidence in sectoral policies and strategies

	- Watio Pierre, Regional pedagogic inspector for Basic education, MINEDUB, North West region - Clotilda Andiensa, West Regional Delegation for Secondary Education		
Focus Group Discussions (FGDs) and Stakeholders' meeting, 15th and 16th August 2020 in Maroua	Teachers - Ngo Sotong epse Adoulko - Tigevin Pauline epse Sadjo - Halimatou Oumarou - Djarsua Ebenezer - Galouama Rachel - Daouyang David - Aleadou Koudime - Ndavoumta Daniel	Through the FGDs, we sought to gather the experiences of teachers on the preconditions for learning. Through the stakeholder meeting, we introduced the Toolkit Strands and asked about their preferences, identified new strands, identified risks and opportunities, as well as the pathways for toolkit appropriation and sustainability	- eBASE act as an Evidence Centre where we provide teachers with answers to relevant questions - eBASE disseminate evidence summaries (translated in the French language) on specific topics in education to improve on teaching practice
	Students - Awoulawa Rachel - Akissakitok Junior	Learners expressed ideas on the preconditions for learning, and their perception of the learning environment in school and at home in the Northern Regions of Cameroon. Likewise, they expressed opinions on the Toolkit strands, their preferences and how this could contribute to improving their learning	- Encouraging students to adopt learning practices that are proven to work and would contribute to improving their learning outcomes - Targeted Focus Group Discussions with learners who are disabled to acquire in depth knowledge on education for children with disabilities

	Parents - Pahimi Patrice - Adja Tete - Saratou Ndjidda	Exchange on parents' experiences on the preconditions for learning, toolkit strands, identification of new strands and strategies through which parents can use the toolkit to improve on educational attainment. Parents expressed ideas on how their role could positively and negatively impact children. An important point raised was how do parents who are uneducated assist their children with learning at home?	- Planning targeted Focus Group Discussions to explore avenues for improving parental engagement of uneducated parents in the education of learners in the Northern Regions of Cameroon
	Policymakers - Boubakary Mal Mana (Inspectorate of Basic Education, Maroua III Subdivision) - Maina Rahiss (Inspectorate of Basic Education, Maroua I Subdivision) - Morom Hibkreo (Catholic Education Secretariat) - Asta Jacqueline (Far North Regional Delegation for Secondary Education) - Ebah Emini (Far North Regional Delegation	Enunciated their opinions on the preconditions for learning in the Northern Regions of Cameroon, a critical examination of the Toolkit within the policy context of Cameroon (preferences, new strands, risks and opportunities, and appropriation and sustainability)	- eBASE as a Knowledge Brokering Centre to ensure that policies and education strategies are based on high quality evidence - Provide training to policymakers on the use of high-quality research evidence in sectoral policies and strategies

	for Secondary Education) - Taiwe Justin (Far North Regional Delegation for Secondary Education) - Ngondi Naomi Andoulko (Inspectorate of Basic Education, Maroua II Subdivision)		
Focus Group Discussion 9th August 2020, Bamenda	Students from a number of schools (Government Bilingual High School, Bamendakwe; Government Bilingual High School Bamenda; Progressive Comprehensive High School Bamenda).	Provided detailed experiences and examples of how cultural practices and religious beliefs influence education (early marriages for Muslim girls). Expressed their opinions and narrated their experiences with learners living with step-parents, differences between public and private schools, as well as day and boarding schools, ICTs in schools, differences between francophone and anglophone education, student hygiene, menstruation, learning in crisis and corporal punishment	- Encouraging students to adopt learning practices that are proven to work and would contribute to improving their learning outcomes - Targeted Focus Group Discussions with learners who are disabled to acquire in depth knowledge on education for children with disabilities
Focus Group Discussion July 2020, Nigeria	Students from a number of schools (Government Technical College Bida; TEMAT; Government Science	Focus Group Discussion (FGD) Discussions focused on the student's opinions about effects of culture/religion on education, knowledge of government policy on	- Encouraging students to adopt learning practices that are proven to work and would contribute to improving their learning outcomes

	College, Bida; Bayana Secondary School, Bida).	education, preferences on education types (religious or western education), online learning, experiences with teachers in the classroom, menstruation for girls, student leadership, ICT in schools and corporal punishment	
Interview, July 2020, Nigeria	Policymaker - Alikari Ndagiman, Niger State Ministry of Education Agency	The key points of interest were influence of culture and religion on education, policy process (design, implementation and evaluation) at all levels of government, menstruation in schools, sexual and gender-based violence, education for children with disabilities, corporal punishment, and participation of parents and learners in developing education policy. The policymaker highlighted the following points: inadequate teachers and teaching material; no policy at state level on menstruation but sex education is included in curriculum; no policies on sexual and gender-based violence in schools; corporal punishment is strictly prohibited; distinction between hard labour and corporal punishment; and government has neglected teachers	- Working with the Niger State Ministry of Education Agency to provide them with quality evidence on education interventions that work

		while parents and learners disrespect teachers	
Focus Group Discussion, 1st July 2020, Niger	Teachers - M. LOBIT Kader Aboubacar, Lycée de Dosso - Mme Mamata BARAZE, Secteur Primaire de BANIFANDOU - M. Roufaï Aboubacar, Collège d'enseignement Général (CEG 9) de Maradi - M. Zakari Issaka Ismaël, CSP Aimé Césaire Niamey (Privé) - M. Seybou Kalilou Salifou, Ecole Publique - M. Seydou Serki Mahamane, Collège Privé NISAYA	Discussions on the preconditions for learning within the context of Niger. The teachers raised some key issues such as: Qu'ranic schools being better than 'modern' schools; learners today are more disrespectful and distracted; duration for teacher training is quite short; classroom sizes are large (three classes in one lesson hall); and negative attitudes towards female learners who are menstruating	- eBASE act as an Evidence Centre where we will be providing teachers with answers to relevant questions - eBASE will disseminate evidence summaries on specific topics in education to improve on teaching practice
Group Discussion, 26th September 2020, Niger	Policymakers - Mme. Samba Alimatou Babaro, Director of Girls Education at the	Policymakers shared ideas on the influence of culture/religion on education, implementation of government policies, special government programmes for teachers in isolated zones, transfer	- Partnering with the Nigerienne Ministries of Primary Education and Secondary Education to provide them with quality evidence on education interventions that work

	Ministry of Secondary Education Niger) - Mr. Raboiu Maman, Inspector of Primary Education, Niger) - Mr. Assane Hamza, Deputy Secretary General at Ministry of Primary Education, Niger)	of responsibilities to subnational governments, menstruation and corporal punishment. The main points were: culture and religion have been misinterpreted with negative consequences on girls education; the perception "education is meant for boys" is still persistent; uneducated women are unable to teach their children at home or even cater for themselves; menstruation is a taboo topic in Niger although the work of NGOs is changing the narrative; and corporal punishment is strictly prohibited and some teachers have been imprisoned for using corporal punishment on students.	
9th and 10th December 2020 in Yaounde	Policymakers: • Dr. Mih Julius • Director of Bilingual Unit • Mrs. Florence Acho • Director of cooperation and partnerships • Mon. Epanda Appolinaire • MINEDUB-DAT • Hon. Ngam Honore	Ministry staff were interested in institutionalising EIDM as they believed this will be the most sustainable approach to EIDM. Ministry staff were interested in performance-based pay and parental engagement as approaches that can help improve effectiveness and efficiency of teaching and learning.	- Follow up discussions with the World Bank about performance-based pay, cash transfers and community schools.

	• Senator incharge of Youths and Education • Mrs. Clothilde Andiensa • Pedagogy Inspector West region • Ndzie Luc Romeo • MINEDUB-DAJ • Dr. Michael Nkwenti • Teacher Training Program • Yussa Bernadette • CEA/CC/DAJ/MINEDUB • Souley Manou • Direction de l'enseignement Maternel et Primaire		
18th December 2020 in Yaounde.	Programme d'appui à la Reforme de l'Education au Cameroun (PAREC), Ministry of Education: • Bertin Mbassi • Eric NEGUEM • BABA BABA Fréderic • Evang Assembe • Julius Mih • Fede Ndayi • Justina Njika • Madina Daiferlé • Doko Alain • Adarayel Youssoufa	To share ideas information on performance-based pay, cash transfers and parental engagement (community schools)	- eBASE to follow up with World Bank about the possibility of piloting performance-based pay in North West and South West Cameroon.

	• Edward Agien • Edith Mve Ndongo • Awouda Sabine • Valentina Bessem • Kombou Mpessa Yvette • Bihinandi Philomene • Florence Lombe Salle. **The World Bank:** • Vincent De Paul Mboutchouang • Vincent Perrot, • Amaah Penn • Gabriel Tekumafor **Civil society organisations:** • Koumaga Odille (IRESCO) • Nancy Bolima (HEDECS) • Constance Njumanu (GACD) • Patrick Okwen (eBASE) **Academia:** • Prof Chenjoh Joseph (University of Buea)		

	• Prof Joseph Tabe Atem (University of Yaounde)		
29th, 30th, 31st March 2021 in Yaoundé	Teachers • Derick Yong, Honor Bilingual school • Nkike Timothy, Maison Dola • Bukekeh Elvis, Maison Dola • Hubert Mofor, G.B.H.S Bokito • Sangmo Landry, G.S.S Njah • Mbah Promise, Lycee d'etougebe • Abubakar Yaouba, Complex Scolaire Bilingue Ekounou • Fonge Carl, Maison Dola • Ngoussi Elkana, Maison Dola • Kammy Jude, G.B.H.S Mbandjock • Epie Marcel, Maison Dola	Through the FGDs, we sought to gather the experiences of teachers on the preconditions for learning. Over 250 interventions were extracted from the strands of the toolkit and we sought to engage teachers to rate the importance of the interventions taking into consideration the context and policy environment with regards to education.	-

15th and 16th June 2021 in Yaounde	Policymakers: • Dr. Mih Julius, Director, Bilingual Unit • Mrs. Florence Acho, Director, Cooperation and Partnerships • Mon. Epanda Appolinaire, MINEDUB-DAT • Hon. Ngam Honore, Senator (Youth and Education) • Mrs. Clothilde Andiensa, Pedagogy Inspector (West Region) • Ndzie Luc Romeo, MINEDUB-DAJ • Dr. Michael Nkwenti, Teacher Training Program • Yussa Bernadette, CEA/CC/DAJ/MINEDUB • Souley Manou, Direction de l'enseignement Maternel et Primaire	**Continuation of preliminary discussions with policymakers. We sought their opinions on the preconditions for learning, a critical examination of the Toolkit within the policy context of Cameroon (preferences, new strands, risks and opportunities, and appropriation and sustainability)**	- **Once the Teaching and Learning Toolkit is published, eBASE will be producing policy briefs on the evidence summaries to share with policymakers.** - **Organise policy events at the parliament – Senator Ngam Honore to make arrangements for March 2022 sessions at both houses of assembly.**
Activities on the online platform for teachers, Café Ushahidi (ongoing)	**As of October 2021 eBASE have 159 active members.**	**The following topics have been discussed:** • **Parental engagement** • **Repeating a school year** • **Arts participation**	- **eBASE to continue to act as an Evidence Centre where they provide teachers with answers to relevant questions – e.g. 20+ teachers have been in touch to**

		• Menstrual hygiene • Distance learning • Pay for performance • Behavior interventions • Early years interventions	ask questions about research summaries over a 3 month period before publication of the Teaching and Learning Toolkit. - Participation as of recent has been weak to moderate. As lockdown measures are relaxed, Café Ushahidi deliver face- to-face events
Global Toolkit Working Group – online 15th September 2021	Global Education Evidence Network - - Professor Steve Higgins, Durham University/ EEF (Chair) - Jon Kay, EEF (Vice Chair) - Melaine Nasikila, Senior Data Analyst, eBASE - Dante Castillo, Director, SUMMA - Raúl Chacón, Project Director - Knowledge and Innovation Exchange (KIX), SUMMA - Maria Espinet, Evidence Lead, La Caixa	eBASE presented their extensive contextualization approach and process for developing new strands. Discussion around the importance of the menstrual hygiene management strand due to the taboos around menstruation, cash transfer strand due to poverty particularly in rural areas and the urgent need to communicate alternative strategies to behavior management due to the deaths associated with corporal punishment in recent years. Partner from the network were keen to understand how they could replicate eBASE's approach to develop new strands and make the Toolkit more transferable to their contexts.	- Stakeholders who operate in LMIC settings are considering whether to adopt the new strands. - Stakeholders are considering replicating eBASE's approach to make new strands e.g. nutrition.

	- **Amy Faux, International Project Manager, EEF** - **Sandy Qarmount - Research and Programme Development Specialist- Queen Rania Foundation (QRF)** - **Danielle Toon, Director, Evidence for Learning (E4L)** - **Mohammad Zaman, Toolkit Project Manager, EEF**		

Annex C: Example local evidence summary

Feedback

1.0 Background:

The text below is a summary of the research evidence on the impact of Feedback on the educational attainment of school pupils in sub-Saharan Africa. It is an analysis of individual studies of feedback in sub-Saharan Africa. The information here is valuable for African school leaders, administrators and policy makers. It is even more valuable for parents who maybe thinking of better ways to improve on the educational attainment of their children.

Effective Basic Services (eBASE) Africa developed this summary using available research evidence while also taking into consideration prominent themes arising from key informant interviews (KII) and focus group discussions (FGD), particularly FGD with teachers and students. This implies the presence and participation of all key stakeholders; the policy makers, the implementers or enforcers of policy and the beneficiaries. The research evidence in this summary is acquired from a detailed and replicable search protocol used on a wide range – listed below - of research databases for related studies in low- and middle-income countries in general and sub-Saharan Africa in particular**.**

1.1. Definition of the strand:

The primary purpose of providing feedback is to reduce the gap between learners' current knowledge and skills, and the desired curriculum learning outcomes. It is information given to the learner and/or teacher about the learner's performance relative to learning goals. Feedback should aim to and possess the capability of improving learning (Higgins, et al., 2016).

2. 2.0. Research Evidence in Sub-Saharan Africa:

Between 1990 – 2015, there not many high-quality studies, reviews or impact evaluations on diagnostic feedback carried out in Sub-Saharan Africa (SSA). There are however, a few quantitative and qualitative studies on the impact of feedback on learning outcomes in some SSA countries. This is relevant for providing orientation to teachers on the kind of feedback mechanisms that have proven useful within different contexts in Sub-Saharan Africa.

The role of teachers in improving educational outcomes has been a subject of discussion in education research literature in SSA. Post-independence, the education milieu in many SSA countries was dominated by persistent poor teaching practices such as chalk-and-talk, teacher-centred pedagogy, with calls for a shift towards a learner-centred pedagogy (UNESCO, 2004). A study on the Formative Assessment Professional Development Programme (FAPDP) was tested through a randomized controlled trial (RCT) in South Africa. The results indicated that when teachers provide learners with motivational comments of encouragement as well as detailed comments on how to improve their work, more teachers in fee-paying schools expected learners to 'be happy', while more teachers in

no-fee schools expected learners 'to improve'. This shows how teachers view their written feedback practices (Kanjee, 2018). Similarly, Ngwenya (2019) notes that accounting teachers in a rural South African community affirmed the need for learners' responses to feedback, as it indicates the learners' understanding or lack thereof of what is required of them. Teachers use feedback to support learners and allow them learn from their mistakes by identifying individuals in need of assistance and creating time for further explanation. A quasi-experimental study, using the Assessment for Learning (AFL) approach suggests it is an effective approach for providing feedback. Learners taught using the AFL, scored high especially in science subjects than those who were taught with the the normal routine instruction from class (Oyinloye & Sitwala, 2019).

Some studies have highlighted the challenges to implementing proper feedback in SSA. According to Ngwenya (2019), accounting teachers in some rural South African communities indicated that the time allocated to teach accounting and attend to learners' challenges was inadequate, and offering extra lessons is impossible due to long distances some learners had to cover back home. To Salzano & Labate (2016), the African context characterised by large class sizes coupled with time constraints impeded the implementation of learner-centred, differentiated and corrective learning pedagogies. As such, individual feedback sessions with learners in difficulties are rare. Likewise, Naylor & Sayed (2014), Moloi & Kanjee, (2017) explains that inadequate teacher preparation and support, large classrooms, lack of resources and entrenched cultural and pedagogical practices hamper the process of changing teaching styles in Africa. Govender (2019) argues that some teachers in South Africa who have completed Assessment for Learning trainings experience difficulties integrating formative assessment in their daily practice. This is because of the emphasis on 'assessment' rather than a pedagogy that is the focus of learning.

3. 3.0. Summary paragraph

The available evidence on feedback practices in Sub-Saharan Africa comes from Southern Africa, particularly South Africa where feedback interventions have captured teachers' expectations from written feedback and teachers' experiences with communal feedback in rural communities. Teachers' expectations from written feedback vary with the school status (fee paying and no-fee schools). In addition, teachers approved the need for feedback in rural communities, which is used to support learners based on their needs hence improving learning outcomes.

Other studies have identified major impediments to effective feedback in SSA like inadequate time allocated for teaching and attending to learners, large class sizes, lack of capacity, inadequate teacher preparation and lack of teaching and learning resources.

A joint publication by the World Bank and the *Agence Française du Développement* states that between 1990 - 2015, feedback was amongst the education interventions with no impact evaluations or high-quality studies in Sub-Saharan Africa (Bashir, Lockhead, Ninan, & Tan, 2018). Due to the global evidence of positive learning outcomes for feedback, it would be important to carry out further research in Sub-Saharan Africa on feedback practices to fully ascertain its impact on learning within this context.

4. 4.0. Impact, Security, and Cost of Local Evidence:

The available evidence investigating the impact of feedback in SSA suggests a positive association between feedback and educational outcomes. The evidence is however limited hence the need for more robust studies.

The cost of implementing a feedback scheme in SSA, particularly in the Lake Chad Basin is likely to be moderate.

Search Terms

School feedback, Assessment for learning, individual feedback, collective feedback, communal feedback, assessment feedback, formative assessment, learner-centred pedagogy, corrective learning pedagogy, diagnostic feedback, constructive feedback, individual attention, formative pedagogy, classroom-based assessment, Sub Saharan Africa

Databases Searched

Google scholar, Google, Open Knowledge Repository, ResearchGate, Cambridge Core, ERIC, UNESCO, UNESCO-IICBA, 3ie Evidence Portal, EBSCO (BEL, Education Abstract, Education Administration Abstract), Tayor and Francis (Education Research Abstract), Hand Search

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