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RESEARCH ARTICLE

Teachers as educational change agents: what do we currently know? findings from a systematic review

Chris Brown (iD)[1], Robert White[1], Anthony Kelly[2]

[1]School of Education, Durham University, Durham, Co. Durham, DH1 1TA, United Kingdom
[2]Southampton Education School, University of Southampton, Southampton, Hampshire, SO17 1BJ, United Kingdom

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Abstract

Change agents are individuals who can successfully transform aspects of how organisations operate. In education, teachers as change agents are increasingly seen as vital to the successful operation of schools and self-improving school systems. To date, however, there has been no systematic investigation of the nature and role of teacher change agents. To address this knowledge gap, we undertook a systematic review into five key areas regarding teachers as change agents. After reviewing 70 outputs we found that current literature predominantly positions teacher change agents as the deliverers of top-down change, with the possibility of bottom-up educational reform currently neglected.

Keywords

teacher change agents, educational change agents, school change, school system change, self-improving school systems, systematic review
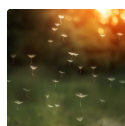
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Corresponding author: Chris Brown (chris.brown@durham.ac.uk)

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Introduction

The term 'change agent' refers to those individuals, whether either inside or outside an organization, who possess the capacity or opportunity to successfully transform aspects of how that organisation operates (Fullan, 1993; Fullan, 2011). Change agents are therefore those who are best able to catalyse the successful introduction of innovations or perspectives into a company, organisation or establishment. They are important across a range of industry sectors and institutions (e.g. Battilana & Casciaro, 2013; Rogers, 1995) and are increasingly seen as vital to the successful operation of schools and school systems. For instance, in 'self-improving' school systems, such as England, Ontario and New South Wales, improvements in pupil outcomes are positioned as occurring when teachers mobilise innovations, practices, perspectives and ideas (collectively described as 'new ways of working') amongst colleagues (Ainscow, 2014; Greany & Higham, 2018; Hargreaves, 2010, Hargreaves, 2012). As these new ways of working are adopted, the attitudes and practices of teachers and other practitioners change, ideally resulting in improvements in pupil outcomes (Earley & Greany, 2017). When such improvement occurs in disadvantaged areas, it can also lead to reductions in the gap in education outcomes between students from the most and least affluent families (Brown, 20   ).

It is envisaged that the mobilisation of new ways of working in self-improving school systems is undertaken by teachers rather than school leaders (Kotter, 2014; Wenner & Campbell, 2017). For example, a key feature of such systems is that etworked collaboration takes place between schools (Armstrong *et al.*, 2021; Campbell *et al.*, 2016; Pino-Yancovic & Ahumada, 2020). Correspondingly, small numbers of teachers may take part in Professional Learning Networks or similar interventions, such as Ontario's Teacher Learning and Leadership Program (TLLP), or the Teacher Education Networks in New South Wales (Brown, 2020; Brown & Poortman, 2018; Mintrop & Zumpe, 2019; Wenner & Campbell, 2017). The aims of these types of approach are to help teachers develop new teaching practices or identify new ideas relating to teaching and learning, which are then shared with colleagues. Yet not all teachers are equal in their ability to mobilise new ways of working, such that they are adopted widely. This means that enabling teachers to engage in such programs will be more - or less - productive, depending on whether these teachers can subsequently mobilise new ways of working within their schools (Wenner & Campbell, 2017). Understanding which teachers are best able to encourage the take up of new ways of working is therefore vital to ensuring that school leaders are able to continuously improve the education provided, as well as improving equity in pupil achievement.

Who makes an effective educational change agent?

We currently have some insights as to which teachers might make the most effective change agents. For example, when viewed through the lens of social network theory, the success or failure of educational change is dependent on the social networks through which it is mediated (Coburn *et al.*, 2010; Warren-Little, 2010). A social network represents a set of relevant actors (persons or groups) connected to each other by a specific type of relationship, which enable individuals to access a range of social capital resources (Coleman, 1988; Daly, 2010; Putnam, 2000). For instance, 'instrumental' social capital resources such as information-sharing, advice-giving and problem-solving, provide concrete support for achieving specific goals. In contrast, 'expressive' social capital refers to resources such as trust, support and encouragement, all of which can influence attitudes towards given goals and instil the resilience required to keep pursuing them (Puccia *et al.*, 2021). From this perspective, change agents are therefore viewed as those individuals best situated within a social network to mobilise both types of social capital in support of a given change (Battilana & Casciaro, 2013; Finnigan & Daly, 2010;).

When viewed through an organisational semiotic lens (e.g. Gazendam *et al.*, 2003), effective change agents are those who are best able to signal that a specific change is attractive enough for others to adopt. In this sense, 'attractiveness' can refer to the idea being represented by the change, but it can also represent the extent to which an idea appears *achievable*; in other words, whether changers believe they possess the ability to successfully pursue it. As with any form of semiotic, a 'thing' (an object or idea) only has meaning when viewed in relation to other 'things' (Eco, 1979). A change agent can therefore position a change as attractive by contrasting it with something that teachers regard as less attractive. For example, Schildkamp & Datnow (2020) observe that teachers are far *more* likely to consider using data to inform their practice when there is an explicit focus on equity, than when data use is undertaken in the service of accountability. The achievability of the change therefore involves change agents signalling certain attributes of the change in question; for instance, how easy a change is to master, and/or the extent to which it involves changers drawing on familiar sets of skills and practices. (Rogers, 1995).

There are also psychological perspectives that add insight; specifically, the concept of heuristics (Kahneman, 2011; Tversky & Kahneman, 1974). One common heuristic is homophily: the conscious or unconscious tendency to associate with people 'like ourselves' (Daly, 2010). There is some debate as to whether homophily is an objective preference. For example, it is suggested that if person A possesses a quality that person B particularly likes or admires, such as high levels of subject or pedagogic knowledge, B will transform their view of A, projecting feelings of similarity and so 'tricking themselves' that commonality exists (Weller & Watson, 2009). Similarly, if person A impresses person B, person B may ascribe it to a quality they believe they themselves possess (*ibid.*). Whether real or perceived, if two people believe they are alike, they are more likely to enter into a relationship than if they believe they are significantly different. Other identified heuristics affecting how people perceive one another include the *reputation heuristic* and the *popularity effect*. With the former, people are 'judged' based on their known relationships, leading to a number of simple but well understood maxims that guide who to connect with; for instance, that 'a friend of my friend is a friend' or that 'an enemy of my enemy is a friend' (Gross & De Dreu, 2019).

The latter suggests that when people see others start connecting with an individual, they will do so too (so explaining why popular individuals tend to become ever more popular, Topirceanu *et al.*, 2018). In summary, what the heuristic perspective suggests is that change agents are those most able to galvanise change because they are viewed as being acceptable to follow: they are seen as 'like me'; as possessing admirable qualities; are likely to be charismatic; are connected to 'others whom I like'. The most effective change agents are those that others gravitate towards.

These three lenses – the social network, the semiotic and the heuristic - are most useful when considering change agents as those attempting to influence an organisation *from the bottom up*, but other perspectives reveal how change agents can affect the introduction of *top-down* change. In other words, when the nature of the change in question has been pre-determined by school leaders or higher-level (local or central) policy-makers. For instance, distributed leadership occurs when leadership activity is more widely allocated by school leaders amongst their subordinates (c.f. Azorín *et al.*, 2020; Harris, 2009; Leithwood *et al.*, 2009) and it is suggested by Hairon & Goh (2015) that distributed leadership can introduce change most effectively when school leaders attend to three main factors. First, when distributed leaders are properly empowered (i.e. when school leaders enable them to make decisions); second, when distributed leaders are supported to interact regularly and deeply with teachers and other practitioners so as to influence their attitudes and behaviours; and third, that school leaders ensure distributed leaders have the capacity to engage in activities such as "rally others towards common group goals, consider individual needs of group members in decision making, [make] decisions based on micro and macro contextual knowledge… and promot[e] shared ownership and accountability" (p. 709).

Research questions

Nonetheless, whether considering change that materialises from the bottom-up or that flows from the top-down, current understanding in terms of how change agents can be conceptualised, identified and harnessed is piecemeal. Furthermore, there has been no systematic investigation into the vital aspects regarding the nature and role of change agents. For instance:

1. The myriad ways in which teacher change agents are conceptualised (i.e. what are the different ways in which teacher change agents are seen as able to introduce change into schools?).

2. The characteristics of teacher change agents, and the ways in change agents can be identified.

3. The activities teacher change agents engage in to actualise change within schools

4. The evidence that exists in terms of the effectiveness of different teacher change agent-types to actualise change.

5. Whether certain conditions are required for teacher change agents to thrive (and conversely, the that factors hinder their role).

To investigate these five areas, the research team carried out a systematic review following the process set out in the internationally recognised Evidence for Policy and Practice (EPPI) guidelines. The specific research questions covered by the review were as follows:

1. How is the position of teacher change agent conceptualised within the existing literature and why is this the case?

2. What are the identifying characteristics of teacher change agents?

3. What activities do teacher change agents engage in to actualise change within schools?

4. What evidence exists regarding the effectiveness of the different types of teacher change agent to improve teaching and pupil outcomes?

5. What individual factors and organisational conditions enable or hinder change agents to bring about change?

Methods
Research approach
A systematic review or systematic research synthesis is an important tool for developing knowledge to inform policy and practice. Their key features are that: 1) explicit and transparent methods are used; 2) the review forms a piece of research in its own right, and follows a staged process of retrieving, screening and reviewing literature items; 3) the review is accountable, replicable and updateable; 4) there is a requirement for user involvement to ensure reports are relevant and useful (with user engagement occurring before, during and after the review process); and 5) that the review is written in an accessible way, such that it can be used by both policy-makers and practitioners (Gough *et al.*, 2012; Rogers *et al.*, 2020). Our intention in conducting the review was to provide the sector with evidence to inform effective change mobilisation and stimulate sector-led and sector-wide debate about how best to improve lead change within and across schools, such that it impacts positively on teaching practice and pupil outcomes. To ensure the research team developed a robust and appropriate approach to the review, the following preparatory work was undertaken prior to and during the project:

- Consultation with (three) school leaders in terms of how change is conceptualised and mobilised within schools. This enabled the research team to ascertain the breadth and complexity of how change is enacted. It also enabled the further development of our search strategy (see below) as well as providing a context for ensuring our research outputs are practically useful.

- A review of recent job advertisements in the area of educational change and innovation leadership to ascertain what recruiting schools regard as necessary characteristics and attributes in these areas. As above, this enabled the research team to ascertain the breadth and complexity of what change is, as well help us further develop and refine our search terms (see below).

- Consultation with (two) academic colleagues working in this area to peer review the protocol below (both have asked to remain anonymous). As well as providing

critique on search strategy, this approach enabled the research team to identify key seminal works in the field, either as part of the review or for the purposes of providing further context.

Search strategy

Following the procedure outlined in the EPPI systematic review guidelines (Gough *et al.*, 2012), the research team developed a comprehensive search strategy to reduce the likelihood of bias (including publication bias), maximize the range and quality of the literature engaged with, and to ensure the production of a rigorous, trustworthy and transparent review. EPPI guidelines recommend four main search approaches: a) electronic-database searches; b) hand searches of journals; c) specialist website searches; and d) the use of personal contacts, authors and experts in the field (which, in our case, also included those consulted prior to and during the review). The sources we employed for the review were as follows:

1. **Electronic databases:** Academic Search Elite/ EBSCOhost; Educational Resources Information Center (ERIC); Google Scholar; IngentaConnect; JSTOR; OpenGray; Psychology and Behavioral Sciences Collection; Social Sciences Abstracts; and Web of Science (databases were last accessed in August 2021).

2. **Hand (online) searches of journals:** Educational Management Administration and Leadership; Innovations in Education and Teaching; International Journal of Innovation in Education; Journal of Educational Administration; Journal of Educational Change; Journal of Educational Leadership, Policy and Practice; Journal of Educational Innovation, Partnership and Change; Journal of Research on Leadership Education; School Leadership and Management; and Teaching and Teacher Education (hand searches completed by July 2021).

3. **Specialist website searches:** The Organisation for Economic Cooperation and Development (OECD); British Educational Leadership, Management and Administration Society (BELMAS); British Educational Research Association (BERA); EPPI-centre reviews; and What Works Clearing House (WWC) USA (website searches completed by July 2021).

4. **Personal contacts, authors and experts in the field.** The investigators on this project are all active members of national and international research networks in their respective fields. These include membership of research special interest groups in BERA and the American Educational Research Association (AERA) and editorial work on several key journals. These networks provided access to a wide range of academic producers and users of systematic reviews, and of change agency itself (consulted in June 2021).

Search terms: Based on our preparation work, our search terms comprised those set out in Table 1 below. Overall, a

Table 1. Search terms derived from initial reviews of the literature, reviews of job advertisements and interviews with school leaders and academic experts.

No.	Search term
1	agents of educational change
2	agents of social change
3	Big 5 personality traits
4	brokerage
5	change
6	change agents
7	change mobiliser
8	change leadership
9	characteristics of teachers change agents
10	characteristics of teachers change agents
11	childhood teachers change agents
12	childhood teachers change agents
13	collaborative change agents music teachers
14	collaborative change agents shaping policy
15	cultural approach change agents
16	curriculum change agents primary teachers
17	diffusion of innovations
18	evidence-informed practice
19	extra mile change agents
20	innovation
21	knowledge mobilisation
22	lead teachers change agents
23	linguistically diverse cld change agents
24	novice teachers change agents
25	pre-service and beginning teachers change agents
26	pre-service and beginning teachers change agents
27	primary school teachers change agents
28	primary school teachers change agents
29	professional learning change agents
30	professional teacher change agents
31	school reform policies change agents
32	secondary stem education agents of change
33	social change agents perspective transformations
34	social change agents perspective transformations
35	social change agents preservice teachers

No.	Search term
36	social change agents preservice teachers
37	student teacher placements change agents
38	teacher images change agents
39	teacher inquiry change agents
40	teacher inquiry change agents
41	understanding teachers pedagogical use of ict
42	understanding teachers self perception
43	understanding teachers self perception

combination of these search terms and the literature sources returned a total of 738 outputs for review.

Selection strategy

Screening refers to the process by which members of the research team assess which outputs returned by a search meet the inclusion criteria and the overall aims of a study. In this study, the screening process ensured that only relevant material from among the 743 identified outputs were utilised in our systematic review (Gough *et al.*, 2012). The selection involved an initial two-step process consisting of:

1. Double screening (i.e. screening by two reviewers) of the Title and Abstract of initially identified articles; and

2. Double full-text screening of articles selected for inclusion after Title and Abstract screening.

Each of these two stages involved the application of criteria to assess whether documents should be included or excluded. In the first stage, the Title and Abstract screening, the following three criteria were used:

1. Study has a publication date after 2010, the publication date of the *Teaching Matters* white paper, which set out the desire to position England as a self-improving school system, so bringing the role of change-agency to the fore.

2. Focused on primary and secondary settings for pupils in the 5-16 age range.

3. The topic of the study is related to the implementation and mobilisation of change within education settings.

To apply these three criteria, search results and abstracts were divided between members of the research team who independently assessed titles and abstracts against the agreed inclusion criteria. Disagreement, when it arose, was adjudicated by the project lead in discussion with an appointed external expert. This process eliminated 394 outputs, leaving the review with 349 outputs to review in the second stage: full-text screening. For the second round, we required that the study met at least one of the following five criteria (AND/OR):

1. The study describes how educational change agents are conceptualised.

2. The study describes how change agents can be identified within educational settings.

3. The study explores how change agents bring about change.

4. The study should provide detail on the change agents' efficacy to implement change; for example, how they have positively impacted teaching or leadership practices or pupil outcomes.

5. The study should detail conditions that support or hinder change agents to introduce change effectively.

For this second round of screening, researchers independently examined the full texts to assess their relevance and potential inclusion. We then subjected remaining studies to in-depth review. This twin approach subsequently removed a further 279 outputs. The final set of studies that met the criteria in full for this systematic review therefore totalled 70. Details on how to access PRISMA flow diagram, which maps out the number of records identified, included and excluded, and the reasons for exclusions, can be found in the *Extended data* section at the end of this paper (White, 2021).

In terms of the nature of the studies comprising the final dataset of 70 studies: 56 were peer-reviewed articles, two were systematic reviews, two were books and 10 were project reports. As for the national context of each study, we observe that 27 are from United States; eight from UK; four from Ireland; two from Canada; two from Netherlands; two from New Zealand; two from Norway; one from Australia; one from China; one from Germany; one from Pakistan; one from Singapore; one from South Korea; one from Sweden; one From Turkey; and 15 were multinational in nature.

Adopting a configurative approach and our criteria for assessing quality

Typically, systematic reviews are characterised as being either 'aggregative' or 'configurative' in nature (Gough *et al.*, 2012; Gough, 2021). The more traditional aggregative approach to reviewing seeks to provide a clear summary of findings from similar studies of phenomena that are clearly defined and understood (Levinsson & Proitz, 2017). Such an approach is useful for addressing issues of effectiveness, impact and improvement (i.e. when exploring questions of 'what works'), but are less useful when synthesising complex bodies of research to explore what is happening and why. Correspondingly, for this review, we adopt a configurative approach. With configurative approaches, the synthesis is primarily concerned with organising (configuring) findings from the literatures to address more exploratory research questions (Gough *et al.*, 2012). It is also noted by Gough that research of varying quality can be considered for inclusion within configurative reviews when there is little to be lost by doing so (for example, when simply advancing ideas for the development of future policy or interventions which will then be rigorously tested

[Gough, 2021]). Nonetheless, research question four does explicitly consider the effectiveness of different types of change agents. As such, we imposed a requirement to be more considered about the basis for judging effectiveness, so that more concrete policy-recommendations could be made with greater confidence. To assess the quality of the studies that might potentially be used to explore research question four, we drew on the research quality assessment frameworks developed by both Gorard *et al.* (2019) and Gough (2021) (both of which can be used for any type of study methodology). In terms of the former, Gorard *et al.* (2019) posit that quality assessments should be judged on research design, scale, missing data, quality and relevance of measurements, fidelity, validity and so on. The first step in using the framework is to identify the information on each of these quality factors from each study in question. If the study does not include key information, or is written in such a way that the reader cannot ascertain this information, then the research must be rated as having low security and doubt must be cast on its findings. In other words, the study is assumed incapable of providing data that can form the basis of trustworthy conclusions upon which concrete action can be based (Gorard *et al.*, 2019). Gough's (2021) framework is analogous but adds an assessment of the perspectives underpinning the research. In particular Gough invites systematic reviewers to assess whether these underpinning perspectives cohere with the likely needs of the user of the systematic review - in our case policy-makers and practitioners - and whether alternative perspectives could lead to different truth-claims being made (in which case researchers should use this as a way of critiquing the trustworthiness of any study). In other words, Gough's (2021) framework provides a critical approach to addressing power relations that are often inherent in the research process.

Results

It should be noted that few high-quality studies emerged during the review process in relation to any of our research questions. Correspondingly, for the synthesis stage of the review we directly address each of our five research questions by bringing together the findings of all *relevant* (and, in the case of research question four, trustworthy) studies identified. The review therefore primarily provides a synthesis of current perspectives on teacher change agency as a basis for further exploration rather than as a firm guide to action. Nonetheless in bringing together the studies, our synthesis still represents a thorough (logical and coherent) integration of findings and so leads to a product that is 'greater than the sum of the individual studies' (Gough *et al.*, 2012, p.283). Synthesis for each research question (RQ) is now presented. In keeping with the best practice suggestions made by Gough *et al.* (2012), these syntheses were presented to the three school leaders and two academic experts to check the face validity and level of practical use of our findings.

RQ1: How is the position of teacher change agent conceptualised within existing literature, and why is this the case?

The overwhelming majority of the literature (some 68 of the total 70 outputs reviewed) positioned change agents primarily as those who lead top-down change; i.e. as instigators of change determined by school senior leaders, district officials or other central policy-makers. Correspondingly, very little attention was given in the literature to the situations in which informal change agents press for change based on an agenda they themselves have set (or based on an agenda that was set democratically by their colleagues); and which is based on the domains, values, or issues that change agents (and/or their colleagues) regard as paramount (Wenner & Campbell, 2017). For instance, only a handful of studies included in the review positioned change agents as using their expertise and agency to support the ongoing improvement of colleagues, such as through collective vehicles like professional learning communities or lesson study triads, or in one-on-one mentoring or support-type situations (Leu & Cheung, 2014; Tikly & Barret, 2013; Wenner & Campbell, 2017).

The review identified two distinct ways of conceptualising change agents as leaders of top-down change. The first identified the use of formally assigned teacher leaders to deliver such change (Hairon & Goh, 2015; Lai & Cheung, 2014). This form of 'teacher leader' is typically required to lead change that is continuous and strategic in nature. For instance, they may be given the role of Special Educational Needs Co-ordinator (SENCO) or subject lead. The second conceptualisation was of distributed leaders selected to embed a specific but ad-hoc and tactical need. For instance, distributed leaders may be selected to develop and introduce a specific new pedagogic approach (Brown *et al.*, 2020). Furthermore, the network perspective outlined in the introduction to the paper was also regarded as a way of delivering top-down change. For example, while Battilana & Casciaro (2013) suggest that change agents should be central to an organization's informal network regardless of their position in the formal hierarchy; should act as a bridge between groups and individuals within a network; and should position themselves close to "fence-sitters," (those who are ambivalent about a change), Battilana & Casciaro also position informal change agents as being members of the formal hierarchy co-opted to ensure that change has the best chance of being actualised. This is a view similar to Brown *et al.* (2017) and their discussion of Research Learning Communities, where 'opinion formers' (teachers with prominent network positions) were utilised to introduce research-informed teaching practices into their schools.

RQ2: What are the identifying characteristics of teacher change agents?

Research on how change agents can be identified was also limited. Nonetheless a distinction emerged in the literature depending on whether change agents are considered the instigators of bottom-up change or the implementors of top-down change. The following personal characteristics were seen as important if the desired change is to be successfully implemented by such leaders:

1) Attitudes to change generally or to a particular change, including knowledge, beliefs and values (Fullan, 2011; Lai & Cheung, 2014; Poekert *et al.*, 2016);

2) Mastery of subject knowledge and/or pedagogy; for instance, teacher leaders were usually selected based on a recognition of expertise, which in itself was viewed as a function of years of experience and perceived subject knowledge (Booth *et al.*, 2015; Curtis, 2013; Müller *et al.*, 2021; SSAT, 2013).

3) Whether the teacher leader is a lifelong learner: someone who is curious, open minded or has a growth mindset and is willing to try new approaches (Ali, 2014; Beauchamp, 2015; Bourn, 2015; Schleicher, 2012; Watson, 2014);

4) Whether the change agent has entrepreneurial qualities; for instance, whether they are happy to take risks to see if a change can be enhanced further. Similarly, whether they can encourage others to do the same (Cooper *et al.* 2016; Kools & Stoll, 2016; MacPhail & Lawson, 2020; Wenner & Campbell, 2017).

5) Whether the change agent is an effective collaborator, with strong collegial standing, and someone who can leverage their networks effectively to help secure change (Battilana & Casciaro, 2013; Bourn, 2015; Daly, 2010; Doğan & Adams, 2018; Hairon & Goh, 2015; Law *et al.*, 2010; van der Heijden *et al.*, 2015; Warren-Little, 2010).

Bottom-up change agents, on the other hand - those who take on the personal/professional commitment to advocate for transformation based on grassroot needs - were positioned as requiring the following characteristics:

1) Agency: someone who evaluates need and activates change through a collaborative process that attends to the motivation of others (Bourn, 2015; Lai & Cheung, 2014; Lukacs & Galluzzo, 2014; Priestly *et al.*, 2012; Wallen & Tormey, 2019; Wenner & Campbell, 2017);

2) Displaying cultural competence: bottom-up change agents are aware of the sociocultural context they operate in, have high expectations, a desire to make a difference, and are cognisant of the need to challenge the deficit mindset of colleagues. This type of change leader may also identify means through which to overcome the professional antinomies often faced by teachers working in disadvantaged and challenging situations; including drawing on those holding 'local knowledge', such as that of teaching assistants (Hauge *et al.*, 2014; Lee & Louis, 2019; Liljenberg, 2016; Von Hippel, 2014);

3) An effective relationship builder with colleagues within their school, and also externally: bottom-up change agents engage with key local stakeholders (parents, community groups and so forth) to co-construct the difference they are seeking to achieve and the means of achieving it (Derrington & Angelle, 2013;

Schnellert, 2020; Poekert *et al.*, 2016; Starr, 2011; Tikly & Barret, 2013).

These sets of characteristics and dispositions are not dichotomous and there is likely to be overlaps in terms of the characteristics required for effective change agency, regardless of how the change is initiated. For instance, bottom-up change agents are also likely to be educational entrepreneurs, if attempting to develop new, innovative, approaches to teaching and learning.

The review also revealed a number of tools, methods and approaches developed to identify change agents. These include:

1) **Leadership Practices Inventory:** this self-report survey comprises 17 statements, constructed on a 4-point Likert scale of: *never, seldom, sometimes,* and *routinely* (Angelle & DeHart, 2010). Rather than identify individuals who may be well suited to change leadership, however, the survey measures the extent of teacher leadership generally present in schools.

2) **Purdue Teacher Opinionaire:** this questionnaire is designed to give teachers the opportunity to express their opinion about their work and issues/problems within their particular school.

3) **Actualized Leadership Profile:** this is a brief exercise for school leaders to select one descriptive word each from ten word-pairs that they feel best depicts their professional style.

4) **Mid-continent for Education and Learning's Balanced Leadership Profile®:** a research informed 'profile' that depicts 21 leadership responsibilities that have significant correlations with student achievement.

5) **Teacher Change Agent Scale:** this is a 15 item Likert-style scale designed to measure teachers' willingness to be change agents.

6) **Social Network Theory and Social Network Analysis:** this has previously been used in studies (e.g. Brown *et al.*, 2020; Rose *et al.*, 2017) as a way of identifying 'opinion formers' who to take part in a specific-change intervention. Here, opinion formers were defined as those with the highest levels of 'in-degree' centrality in their school's advice and support network. In other words, they were the people most often turned to for advice and support by colleagues.

At the same time, the context specificity of these characteristics and tools needs to be borne in mind since they are predominantly derived from literature from 'Western' countries or have been developed specifically for Western contexts. Research in this area from 'non-Western' countries, however, remains considerably limited (Ali, 2014). The non-Western studies that qualified for our review (e.g. Ali, 2014) argue that it

is imperative to problematize the 'taken-for-granted' notion of teacher leadership in contexts such as Pakistan. In such contexts, one's right to become a leader – whether in society or school – is not judged by an individual's ability and qualification to perform certain tasks, but rather by considerations such as gender, race, cast, kinship, and so forth. Lai & Cheung (2014) highlight that reviews of teacher leadership literature reveal how little is known about how teacher leadership manifests itself in Asian societies. Only a few studies on teacher leadership have been undertaken within Asia, necessitating a deeper and more internationalised understanding of what identifying, change agents means in such contexts (Law *et al.*, 2010).

RQ 3: What activities do change agents engage in to actualise change within schools?

Lai & Cheung (2014) provided the most detailed study in this area, suggesting that teacher leadership involves the following six roles when introducing top-down change:

1) interacting with other school members around school reform efforts

2) striving for pedagogical excellence

3) confronting barriers in the school's culture and structures

4) translating ideas into actions

5) participating in decision-making

6) taking the initiative in leading school improvement.

They go on to argue that in performing these roles, teacher leaders often attempt to achieve three goals:

1) to encourage others to improve their professional practice;

2) to nurture a culture of success; and

3) continuously demonstrate professionalism (i.e. 'walk the talk').

In a similar vein, Stanulis *et al.* (2016) posit there are three broadly conceived means through which teacher leaders influence change:

1) by maintaining focus on teaching and learning;

2) by establishing trusting and constructive relationships; and

3) by interacting through formal and informal points of influence.

Stanulis *et al.* (2014) also note, however, that current research fails to articulate the specific actions and tactics teacher leaders should adopt as they engage in those relationships and interactions so as to effectively change the pedagogy of other teachers. Research into distributed leadership, (e.g. Brown *et al.*, 2020) indicates, however, that distributed leaders can work effectively as agents of change when they lead processes of

professional inquiry within professional learning communities (also see Angella & DeHart, 2011; Lee & Louis, 2019). Specifically, when distributed leaders attempt to introduce change by guiding their colleagues to explore specific issues of teaching and learning, by introducing colleagues to new ideas relating to specific problems of teaching and learning, by supporting colleagues to test out these new ideas in risk free environments, and by inviting colleagues to consider the impact of new approaches to teaching and learning and how they can be refined, augmented and incorporated into existing practice. The result is teachers working with distributed leaders begin to engage with new pedagogic practices as experts (Brown *et al.*, 2020; Mintrop & Zumpe, 2019).

RQ 4: What evidence exists regarding the effectiveness of different types of teacher change agent to improve teaching and pupil outcomes?

Our review found limited empirical evidence in terms of the effectiveness of different change agents to actualise change. The majority of evidence relied on subjective self-reporting, as part of small-scale case studies or perspective-taking interviews. Furthermore, there was little homogeny across studies and few were suitable for any form of meta-analysis that could be used to support or refute the effectiveness of different types of change agency. Evidence focused primarily on teachers who were assigned leadership responsibility (i.e. teacher leaders). As noted earlier, lead teachers are seen as uniquely positioned to promote educational change, since they understand the complexities of teaching, have the necessary knowledge and skills to support teachers with content-specific issues and are able to foster teacher collaboration (Curtis, 2013). Only a few studies have examined the work of lead teachers as change agents in the context of school-wide change (Wenner & Campbell, 2017). Most notably among those that exist, (in terms of the quality of the study and trustworthiness of findings), Shen *et al.* (2020), indicates a small statistically significant positive relationship between teacher leadership and student achievement ($r = .19$), with a stronger relationship for math achievement than reading achievement ($r = .24$ for math; $r = .18$ for reading). As far as teacher leadership dimensions are concerned, "facilitating improvements in instruction and curriculum" not only has the largest absolute relationship ($r = .21$), but also has unique relative association with student achievement when controlled for all other teacher leadership dimensions (p. 288). Their results did not support the assumptions that the relationship between teacher leadership and student achievement differs between studies that conceptualize teacher leadership in different ways; nor is there any evidence that the relationship between teacher leadership and student achievement differs between elementary and secondary schools, or between studies that use different measures of outcomes or student achievement.

An evaluation of the opinion-former/distributed leadership model of change agency was undertaken by Rose *et al.* (2017) using a randomised control trial set in primary schools in England. The opinion-formers involved were invited to participate, having been identified using social network analysis to determine the extent of their centrality within their

school's advice-seeking networks. These opinion-formers were tasked with attending eight Research Learning Community (RLC) workshops over the course of two years. Within the workshops, opinion formers were facilitated to engage with research evidence relating to particular problems of teaching and learning, to develop research-informed teaching informed by this research, and to test and embed these interventions within their 'home' schools. School leaders were also invited to attend workshops so as to understand how best to support their opinion-formers as part of the process. Overall a total of 60 primary schools working across 14 RLCs were allocated to the treatment group, and 59 to the control group. Although the evaluation found no direct link between the workshops and improvements in children's outcomes (specifically in reading), teachers in intervention schools did report a greater disposition towards use of research evidence to inform their practice and an improved culture of collaboration between colleagues. These findings were replicated in a small case study evaluation of the RLC model, which explored its use in three primary schools in Hampshire, England (Brown *et al.*, 2020). Here data showed that the RLC approach, when used alongside a within-school Professional Learning Community model, could enhance collaboration and improve the effective engagement by all school colleagues with new, research-informed, approaches to teaching and learning.

Other findings centred on the notion of collective leadership, defined as the democratic distribution of influence and control among school administrators and teachers (Poekert *et al.*, 2016). Here two studies of note were identified. The first suggested that teachers' perception of collective leadership, as it relates to motivation, is positively linked to improved student performance (accounting for 20% of variance across the Australian schools in the study) (Leithwood & Masscal, 2008; cited in Awadh, 2018). A second study by Leithwood *et al.*, (2010, cited Poekert *et al.*, 2016) further demonstrated the impact of collective leadership on student performance across 199 schools in Canada. Using path modelling techniques, the researchers examined the impact of collective leadership on student performance in mathematics and reading in Grade 3 and Grade 6. Results indicated a significant impact of such leadership mediated by rational (i.e. knowledge and skill), emotions (i.e. learning conditions), and family (i.e. external factors). A notable finding documented that collective leadership had the most direct influence on 'organisation' (i.e. culture, policies, organisational structures), yet organisation had no significant impact on student learning. Rather, collective leadership demonstrated an *indirect* impact on student achievement, mediated by the other variables (Leithwood *et al.*, 2010; cited in Poekert *et al.*, 2016). The overall model accounted for 43% of the variance in student performance among the 13,391 students. Together, these two studies, supported by research done in Scotland by Alexandrou (2015), indicate that leadership enacted by teachers who possess certain qualities, given appropriate conditional supports, can utilise effective practices to influence individuals, teams and schools; which can, in turn, impact student performance.

RQ5: 5. What individual factors and organisational conditions enable or hinder change agents to bring about change?

This research literature identified four main factors that may enable or inhibit teacher leaders' change efforts. These are: 1) principal or school leadership support; 2) buy-in to the role by practitioner colleagues; 3) access to training and professional development; and 4) perceived autonomy and teacher leaders' own positioning in the role (McKinney *et al.*, 2015; Meyer & Slater-Brown, 2020; Poekert *et al.*, 2016). To begin with, school leaders can show acknowledgment and recognition of teacher leaders' roles as change agents by providing them with classroom release time to work with colleagues, remuneration for the role, or other organizational support such as timetabling in a way to enable them to observe and support colleagues (Brown & Flood, 2019; Chew & Andrews, 2010; Gaffney & Faragher, 2010). A lack of time or structural resourcing was noted as a major barrier to teacher leaders' work, especially since their work is likely to be additional to already busy teaching workloads (Durias, 2010; Margolis & Huggins, 2012). In terms of the second factor, teacher resistance to change can make teacher leaders' work as change agents difficult and a perceived lack of support from school leaders can fuel such resistance (Margolis & Doring, 2012). Again, school leaders can provide assistance here, since a shared vision for change can help teacher leaders' positioning in the eyes of staff members (Margolis & Doring, 2012).

There seems to be little preparation and training afforded to teacher leaders' to act as change agents. Programmes vary widely from conferences, centralized professional development and local training courses to university master degrees (Durias, 2010; Wenner & Campbell, 2017). Findings from a rapid literature review undertaken by Booth *et al.* (2021) suggest that 'second stage' teachers (defined as those with 3–10 years' experience) who take on 'reform' roles (roles which involve attempting to change the practice of colleagues) generally benefit from two forms of professional development. The first type is that which helps them promote their role, especially when norms exist within schools regarding teacher autonomy, and respect tends to be reserved for those with the highest levels of experience and seniority. The second form of professional development is that designed to support teacher leaders when they encounter resistance to change in their context. Teacher leaders' own perceptions of their role as change agents, and their autonomy to act, can either support or hinder them in fulfilling their mission. The teacher leaders' role is often perceived as blurring the line between teaching and leadership in schools and research has found that teacher leaders can struggle to define and identify with it (Poekert *et al.*, 2016; Struyve *et al.*, 2014).

In terms of distributed leadership, the process evaluation of the Research Learning Community intervention (Rose *et al.*, 2017), where opinion-formers were used as change agents, found that staff turnover, competing priorities and the limited time of teachers were barriers to the successful implementation

of change, echoing some of the issues faced specifically by teacher leaders. This was because opinion-formers needed to be able to commit to the full duration of the intervention, attend all the workshops, and have time in school to develop their ideas and discuss the project with colleagues. Similarly, work undertaken by Brown & Flood (2019) indicates that, if distributed leaders are to be effective change agents, then school leaders need to attend to three areas. First, school leaders need to ensure that distributed leadership activity is formally linked to the policies and processes of the school (such as school improvement plans), so as to signal its importance, and position it as something that is key to a school's culture and way of working. Second, by creating the time and space for distributed leaders to interact with colleagues, thus enabling new ideas to be mobilised. Third, to help distributed leaders understand how best to mobilise new ideas. This is particularly important, given that our current understanding indicates that the passive dissemination of new ideas and practices is ineffective, while the most impactful forms of mobilisation involve school staff actually engaging with innovations, collaboratively testing out how new practices can be used to improve teaching and learning, and continuing to use and refine new practices in an ongoing way.

Finally, and more generally, is the role of trust and the importance of developing cultures of organizational learning in schools. A culture of organizational learning refers to the habits of searching for new information and ideas, and in conjunction with others, normalizing the notion of experimenting with new ways of working (Kools & Stoll, 2016; Pigott *et al.*, 2021; Schechter & Qadach, 2012). In other words, a culture of organizational learning is one that embraces change, thus making the role of change agents relatively easier. Cultures of organizational learning are, in themselves, dependent on high levels of trust within schools. This is because in high-trust situations, teachers feel supported to engage in risk-taking and innovative behaviours associated with embracing change. They will more readily engage in efforts at developing or trialling new practices since they perceive that it is 'safe' to do so. When individuals feel confident with one another in taking risks and feel able to expose vulnerabilities, they are generally better equipped to identify and voice problems, seek support and feedback, innovate, and connect to others across the organization (Angella & DeHart, 2011; Moolenaar & Sleegers, 2010).

Discussion

Our review has shown that change agents are generally conceptualised in the literature as being those individuals who are best able to support the introduction of new top-down (as opposed to bottom-up) change, but none of the studies reviewed provided strong evidence of the efficacy of the different types of change agent. Correspondingly, if school leaders or policy-makers wish to pursue a top-down approach to change in their school or school system, this review can only offer promising ideas on who might make the most effective 'top down' change agents and how best these change agents can be supported to ensure that the desired change

materialises. In particular, our review suggests that school leaders are likely to want experienced, knowledgeable practitioners who are innovative by nature and are in broad agreement with the change being proposed. At the same time, potential change agents will need to be respected by their colleagues and well connected with others across the school, especially with those likely to be 'on the fence' when it comes to change. Potential change leaders will also need support through the provision of time allowance, the opportunity for interaction in order to influence others and suitable training.

If the goal is to move away from top-down approaches to change - for instance, to develop schools as more democratic institutions in which teachers are able to steer both the 'hows' and the 'whys' of teaching and learning (i.e. both pedagogic practice as well as the goals, values and purposes of education) - then the lack of available literature means that our review can only provide limited insight. This is unfortunate, because the policymakers and academics who envisaged the idea of self-improving school systems (e.g. Department for Education, 2010; Hargreaves, 2010) had in mind improvement led *by* teachers *for* teachers, albeit with a tight system of accountability and performativity. Achieving this type of improvement requires an interplay between formal school hierarchies and other networks of practitioners, which exemplifies what Kotter (2014) describes as a "dual system". As Kotter (2014) notes, "in truly, reliable, efficient, agile and fast enterprises, the [informal] network meshes with the more traditional structure…it is not a super task force that reports to some levels in the hierarchy … it is seamlessly connected and coordinated with the hierarchy…" (p. 20). This seamless meshing requires teachers to be afforded the autonomy and freedom to innovate, and successfully to scale-up the use of innovations. In education, the realisation of such an interplay has been closest in situations where distributed leadership has truly been able to thrive; in other words, where school leaders have ceded aspects of control and where there is shared responsibility amongst teachers and other practitioners in terms of achieving success or goals (Brown, 2020; Brown *et al.*, 2020; Spillane & Sherer, 2004). As a result, the practitioner body becomes a professional learning community which engages in collective intelligence and sense-making; with change for improvement emerging as an interactive process of influence designed to achieve organisational ends. But even here, forms of leadership will necessarily emerge if change is to occur in a systematic and organised way (i.e. in a way that is most likely to achieve positive ends at scale). Drawing on previous research (e.g. Muijis & Harris, 2003), Lai & Cheung (2014) argue that the two core components that enable teachers to move from being simply *collaborative colleagues* to *change agents* are 'vision' and 'empowerment'. In a truly distributed system, empowerment has already been 'granted' by school leaders, which suggests that change agents in such situations are likely to be those with a compelling vision. But a compelling vision is, in itself, representative of another form of empowerment; that is to say, a vision can only be compelling if colleagues actively 'buy into' the change being proposed. Practitioners are most likely to do this when the change in

question reflects *their own* thinking and perspectives, which will surface via the processes of interactive discussion (Hairon & Goh, 2015).

Practitioners are, *ceteris paribus*, generally likely to more readily empower some colleagues over others, and more likely to choose to be led by them. As such, returning to the three perspectives introduced at the introduction of the paper (social network theory, the organisational semiotic perspective and the heuristic lens) we argue that is logical to suggest that the most effective bottom-up change agents will not only be the teachers most motivated to advance specific goals (i.e. possess vision and purpose), but will also be those who can make this vision compelling by: 1) benefitting from others' perceptions of them; 2) benefitting from an optimal position within a school's social network; and, as a result, 3) are better able to advance specific priorities for change through drawing on the social capital resources at their disposal. Furthermore, they will also be able to use their knowledge of both the school and its context, and the staff and their current practices, to position such changes as being attractive to as many people as possible, so ensuring implementation (Rogers, 1995). Yet, given the absence of both conceptual and evaluative research in this area, we can only advance these ideas as suggestions to be further investigated.

Conclusion

The Greek philosopher Heraclitus famously argued that the world is constantly in a state of flux, a sentiment revisited by Bauman (2012) two and a half millennia later when he suggested that constant change is the only permanent characteristic of modern society. In education, being able to harness change is a fundamental part of how teaching and learning is enhanced: whether the mechanisms for doing so are top-down or bottom-up (Fullan, 1993; Fullan, 2011). To ensure that change materialises in an organised and systematic manner, however, effective change agents are needed. When we set out to undertake this review it was on the assumption that it would be a first step in understanding how change agents are conceptualised and how they can be harnessed and supported most effectively. Our review has shown that there are still substantive gaps in our knowledge of what effective change agency comprises; in particular, we show that if the desire is to persist with more 'command and control' style structures, then further research is required into which change agents are best able to deliver this type of approach, and the factors that will affect their efficacy. We suggest that the most pressing concern is to undertake research that finds evidence of the effectiveness of different teacher change agent-types in actualising change (RQ4) and to discover the conditions required for teacher change agents to thrive (RQ 5). Only then can school leaders and policy-makers be provided with the concrete basis for action.

When considering self-improving, bottom-up change, understanding is weak across the field, and this has implications for moving towards models of bottom-up, distributed change more broadly. For instance, models of change such as Ontario's TLLP form part of a growing international discourse that

spotlights teacher agency as fundamental to improving educational quality and equity; in particular, that teachers should be central and instrumental to educational change rather than positioned as the passive recipients of externally mandated reforms (Wenner & Campbell, 2017). As a result, teachers in systems like Ontario are charged with leading changes in educational policy and practice in partnership with educators at all levels of the education system (Gallagher *et al.*, 2016; Wenner & Campbell, 2017). The potential benefits are manifold and include positive effects on teacher knowledge and pedagogic practice, collaboration and social capital development, and more equitable approaches to education generally. Yet even in jurisdictions promoting this kind of radical shift, there has been no substantive evaluation work to rigorously evaluate the benefits of such an approach (with research into the impact of TLLP, for example, relying on self-report data); nor to identify the nature of the change agents or the types of change agentry that emerge as a result. Consequently, if there is a normative desire to move towards these types of bottom-up approaches, further research is needed into three key areas. First, the actual benefits of promoting models of bottom-up change (for both teachers and pupils). Second, how change agents are likely to lead this process (both in terms of who comprises those likely to lead change and the mechanisms through which change agentry operates). Finally, research is also be needed into the types of support bottom-up change agents will require if they are to thrive.

Data availability
Underlying data
All data underlying the results are available as part of the article and no additional source data are required.

Extended data
OSF: Teachers as educational change agents: what do we currently know? findings from a systematic review. 2010 – 2021. https://doi.org/10.17605/OSF.IO/ANVGD (White, 2021).

This project contains the following extended data:

- PRISMA SLR Teacher Change Agents.docx (depicts the flow of information through the different phases of the systematic review. Specifically, the diagram maps out the number of records identified, included and excluded, and the reasons for exclusions).

Data are available under the terms of the Creative Commons Zero "No rights reserved" data waiver (CC0 1.0 Public domain dedication).

Reporting guidelines
OSF: PRISMA checklist for 'Teachers as educational change agents: what do we currently know? findings from a systematic review'. https://doi.org/10.17605/OSF.IO/ANVGD (White, 2021).

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