

Exploring Teachers' Conceptual Uses of Research as Part of the Development and Scale-Up of Research-Informed Practices

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Abstract

Research Informed Teaching Practice has become a fundamental aspect of educational reform in the modern world, aiding the development and improvement of teaching and learning, decision-making and the school improvement agenda in general. This article presents the findings from a small-scale study across three infant schools in England involving 15 teachers that found that teachers use of research tends to be conceptual in nature. RITP is achieved through an approach that can help teachers engage effectively with research evidence in order to adapt existing research/research-informed interventions to achieve the desired impact. The requirements for this type of conceptual research use tends to have a functional and measurable nature linked to continuous quality improvement.

Keywords: Research use; School improvement; Research informed

Introduction

This article examines the idea of research-informed teaching practice (RITP) and how it can be instigated in order to achieve the goals of improved teaching and learning. Since the groundbreaking work of Carol Weiss (1979) in the 1970s, approaches to using academic research to inform teachers' practices have invariably been categorized as having either instrumental or conceptual aims. The notion of instrumental research use suggests a direct link can occur between research findings and action;

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conceptual research use encapsulates the idea that research typically guides thinking and is considered in relation to other evidence and knowledge, which is often tacit and contextual in nature. Grounded in the argument that conceptual research use is more likely and realistic than instrumental research use, this article explores what can be learnt from a small-scale project designed to help teachers engage with and employ research in a conceptual way, so that this engagement measurably impacts on their practice and the outcomes of their students.

What is research-informed practice?

Matt Walker describes the notion of RITP (2017) as the process of teachers accessing, evaluating, and applying the findings of academic research in order to improve teaching and learning in their schools. RITP can be considered a fundamental aspect of educational reform in the modern age because it involves the examination and re-examination of practices in the light of information about those practices, and it is typically undertaken within a paradigm that privileges the pursuit of continuous improvement (Bauman, 2012; Giddens, 1990). It is no surprise, therefore, that, in what Zygmunt Bauman (2012) refers to as the “liquid modern world” (p. 64), RITP is an increasingly pivotal part of many recent policy initiatives by governments seeking to foster school improvement from the bottom-up or in ways that are self-improving (Greany, 2014). In this light, the expounded goals and outcomes expected of RITP typically include continuously improving school standards, adopting innovative approaches for delivering education, a ‘future-proof’ teaching workforce that works collaboratively to continuously improve through research and development activity, and school leavers with the skills required for the knowledge economy (Malouf & Taymans, 2016; Peurach, 2016; Walker, 2017).

How research-informed practice materializes in classrooms

Numerous studies and commentaries have examined how research evidence can affect practice (i.e., how teachers act after engaging with research). Probably the most commonly used theory of research utilization is Weiss’ (1979) suggestion that research can be employed in either instrumental or conceptual ways¹ (e.g., Amara, Ouimet, & Landry, 2004; Ion & Iucu, 2014; Penuel, Davidson, Herlihy, Sherer, Hill, Farrell, & Allen, 2017; Rickinson, 2005). Carole Estabrooks (1999) explains these terms in the following way: instrumental research use is the use of research findings that are directly applied through decision-making or in terms of how a service is subsequently delivered. Conceptual use, meanwhile, refers to a cognitive process where research findings enlighten a person’s perceptions or understanding and indirectly impacts on their decision-making. A similar distinction can be found in an article by Steve Makkar, Sue Brennan, Tari Turner, Anna Williamson, Sally Redman, and Sally Green (2016), which argues that research may directly steer decisions and actions (instrumental use) or provide new ideas, understanding, or concepts (conceptual use). Finally, Sandra Nutley, Isabel Walter, and Huw Davies (2009) refer to instrumental use as “the direct use of research in changing practice” and conceptual as “the indirect use of research in reshaping the ways people think about practice” (p. 553). Thus, instrumental use implies a *direct* translation from research to practice;

with prototypical examples including medical guidelines for washing hands and proformas for checking the safety features of aircraft (e.g., see Michie, Johnston, Abraham, Lawton, Parker, & Walker, 2005). Conceptual use, meanwhile, corresponds to a more indirect influence, since research engagement serves to change the way a person views a problem or the possible solution spaces for a problem (Penuel et al., 2017).

These research-use typologies are interpreted here as dichotomous; because their academic progenitors chose to define them as separate entities, they should be treated as such. While other positions exist (i.e., that instrumental and conceptual uses represent the ends of a spectrum rather than classes of a concept), this was not the original intention of academics such as Weiss (1979). In particular, this is because Weiss (1979) defined a myriad of research-use types, not just the two “extremes” that are normally situated at each end of a range of options. This indicates that each use type was intended to be separate and should be regarded in that way. This is the position of this article.

As separate research-use types, the vital difference between instrumental and conceptual use would seem to be premised, therefore, on how educators are expected to engage with research vis-à-vis their decision-making and actions. Specifically, instrumental use is thought to involve a direct move from research to practice: a solution is identified, adopted, and then used. Ideally, such a solution would be an intervention shown by research to improve children’s outcomes that can be implemented with fidelity. Through a conceptual-use lens, however, research evidence acts in a way analogous to a streetlight: it serves to illuminate or inform thinking in relation to a given problem and a solution to that problem. Numerous sources suggest, however, that pure instrumental research use is unrealistic. Notwithstanding the fact that a given evidence base relating to a problem of practice is likely to be insufficiently concrete to provide a definitive course of action (e.g., Biesta, 2007; Hammersley, 1997; Wisby & Whitty, 2017; Wrigley, 2018)—although this article focuses on an intervention where concrete evidence does exist, so this issue can be sidelined for now—teachers simply do not employ research in this way. For instance, Mike Coldwell, Toby Greany, Steve Higgins, Chris Brown, Bronwen Maxwell, Bernadette Stiell, Louise Stoll, Ben Willis, and Helen Burns (2017) note that there is “limited evidence from [their] study of teachers directly importing research findings to change their practice. Rather, research more typically informed their thinking and led—at least in the more engaged schools—to experimenting, testing out and trialing new approaches in more or less systematic ways” (p. ix). Virginie März and Geert Kelchtermans (2013), having examined the relationship between research and its implementation, also conclude that “teachers’ practices are never simply a matter of executing prescriptions and procedures” (p. 13). Likewise, Eileen Gambrill (2010) reports that instrumental research use typically does not occur because teachers’ decision-making processes are complex: they involve the synthesis of knowledge relating to not only local and individual characteristics but also values, preferences, and resources as well as the domain-specific knowledge associated with teaching. These ideas are also underpinned by constructivist/socio-cultural learning perspectives that flag the importance of participation in cultural (e.g., organizational) practices in de-

termining understanding (Paavola, Lipponen, & Hakkarainen, 2004). As such, research use in education can never be 100 percent instrumental and, correspondingly, RITP should be thought of as decision-making that encompasses a *combination* of knowledge types. This makes research use fundamentally conceptual in its nature but with the possible role of research in the decision-making process varying depending on certain factors, including its availability, its concreteness, presiding contextual factors, and the practical knowledge currently in play.

At the same time, as noted above, RITP activity is invariably required to have functional outcomes since there is an expectation that any engagement with research should lead to positive pedagogic change (e.g., changes in teacher understanding and/or practice), and, furthermore, that such changes should be beneficial for children and students. For instance, school improvement initiatives in this vein, typically driven by high-stakes accountability, often view RITP as comprising an iterative, evidence-based cycle of inquiry in which change agents identify needs, research/research-informed solutions, and metrics directly linked to improvements in specific practices (e.g., see Bryk, Gomez, Grunow, & LeMahieu, 2015). Here a theory of action connects a data-informed understanding of a problem to rapid cycles of research-informed change and evaluation (Mintrop & Zumpe, 2019). This idea of “continuous quality improvement,” according to the principles of improvement science or design development (Bryk et al., 2015; Mintrop & Zumpe, 2019), thus calls for “tight ‘means-ends’ connections in which solutions are employed to address contextually diagnosed problems, and effectiveness is verified through practice-embedded metrics” (Mintrop & Zumpe, 2019, p. 297). Hand in hand with this functional perspective, therefore, is the expectation that the outcomes of RITPs should be measured to determine their effects.

At the same time, in order to provide “ready-made” solutions that can be drawn on as part of a process of continuous quality improvement, significant efforts have been made to provide an accessible research base on effective educational interventions (Malouf & Taymans, 2016). Examples of these efforts include the synthesis of existing research findings undertaken by organizations such as the Education Endowment Foundation in the U.K. and the Best Evidence Encyclopedia, the Campbell Collaboration, and the What Works Clearinghouse in North America. Underpinning the work of these organizations is the idea that effective practices identified by research both can and should be instrumentally replicated (i.e., scaled-up) by teachers and school leaders within and across schools. It is intended that such replication should occur first via engagement with this synthesized research base. Following this engagement, teachers should undertake specified actions or implement the specified programs highlighted by the engagement and do so with fidelity. At the same time, the world of education is full of examples of failed attempts to implement research-informed solutions (Dede, 2016).

Considering these functional/measurement-related requirements, the notable incidents of instrumental research-use replication “failure,” plus the likely conceptual nature of research use—which is more nebulous than the instrumental research use typically envisaged within the continuous quality improvement paradigm—there is a gap in understanding regarding current approaches to helping teachers engage

with both research evidence and existing research-informed practice solutions. Specifically, there is a need to work within the notions of a policy paradigm of continuous quality improvement and an epistemological paradigm of conceptual research use to help teachers engage with research in a way that they can: 1) understand it; 2) relate it to their existing knowledge, practice, and context in order to ascertain the most effective way to make use of it (i.e., use it in a conceptual way); and 3) assess whether the use of research-informed practices is having the impact desired (i.e., measure its functional outcomes). There has not been substantive empirical investigation into how to support teachers to engage with research, to scale-up research-informed interventions, in ways that recognize that RITP is conceptual but also acknowledge a need to help teachers understand impact. There have, however, been calls to give such research more priority (e.g., Bryk, 2016), and interest in this area can now be seen across fields, such as implementation science and designed-based research (Bryk, 2016; Coburn, Penuel & Geil, 2013). In light of such calls, this article presents the findings of a small-scale research study designed to explore one specific approach to facilitating teachers' conceptual use of research as part of the development and enactment of RITP.

Learningfield Learning Federation: Seeking to become research engaged

The research setting for this article is the Learningfield Church of England Learning Federation. The federation represents a family of three small church infant schools based in Hampshire, U.K., in the villages of Fallowfield, Highfield, and Commonfield that all work closely together under the leadership of the federation headteacher and governing body. One of the federation's improvement plan objectives is for it to become a research-informed federation where schools collaboratively and rigorously evaluate the quality of the education they offer, explore what is needed to improve, take appropriate research-informed action, and engage in an effective evaluation of the impact of their actions. In other words, it is a stated aim of the federation's leadership to change the culture of its schools so that teachers' research use becomes something we do around here. To meet this objective, the executive headteacher of the federation devised a model of professional learning where, since 2016, four of the statutory staff professional-development days allocated to schools in England were dedicated solely to research-informed professional development. Using a cycle of enquiry approach, and in keeping with the functional requirements of RITP, the aim of the model was to enable teachers to work together to engage with research, to identify new practices, to trial these practices, to measure their impact, and then to roll out the most successful within and across the schools in the federation.

The first author of this article was asked to support the Learningfield process by facilitating each of the four one-day workshops and providing support to Learningfield's teachers to enable them to engage with pertinent high-quality research to develop RITP. The subject of the research was effective teacher-student feedback, chosen by the federation executive headteacher as a key area for improvement. The subject of teacher-student feedback also has a relatively concrete research base with which to engage teachers (e.g., see the Education Endowment Foundation's *Teaching*

and *Learning toolkit* or John Hattie's [2011] *Visible Learning*). To support the Learningfield process, and in keeping with the analysis above, the first author of this article engaged in three sets of activities. The first concerned the brokering of research to Learningfield's staff. Here research summaries were produced of extant and pertinent work on feedback (e.g., Flórez & Sammons, 2013; Hattie, 2011; Wiliam, Lee, Harrison, & Black, 2004). This work was synthesized using accessible language and with the nature of the theory of action for feedback: how and why effective feedback is supposed to make a difference to student outcomes. The second activity involved helping teachers involved in the project to use this research conceptually: use the research findings in conjunction with their teacher-held knowledge of effective feedback and also in relation to their understanding of their students and the wider context of their school. After they brought these two knowledge bases together, teachers were supported to develop, trial, and embed research-informed interventions that they believed would be most effective for their situation. The third and final activity was to help teachers judge the impact of their new practices.

To support the first set of activities, a review of extant high-quality research on teacher-student feedback (e.g., see references above such as the EEF's *Teaching and Learning Toolkit* and Hattie's *Visible Learning*) was produced. This research base was augmented with research on metacognition and growth mindsets, which were seen as both related and thematically appropriate. In keeping with the literature on effective knowledge brokering (e.g., Eco, 2014; Hubers, 2016; Morton & Seditas, 2016), the research review was designed to provide the following information:

- An outline of the available research into teacher-student feedback as well as how this research was conducted. A commentary on the strengths and weaknesses of the research base was also provided.
- Details on what current research says about the effectiveness of teacher-student feedback, which situations it is more or less effective in, and for whom.
- Details on researched approaches to teacher-student feedback and the thinking underpinning these uses (i.e., the theory of action for why feedback should improve teaching and learning).
- Details on how teacher-student feedback has been implemented, in what contexts, and for what reasons.

Care was taken to ensure the language used in the review was accessible and teacher-friendly (Cain, 2015). The first author of this article was on hand to answer questions and clarify areas of confusion. Furthermore, although (as noted earlier) the evidence base for this project was largely concrete in its conclusions and recommendations, any questions regarding potential conflict in the findings were discussed as a group and all the participants considered the implications.

In the second workshop of the cycle, participants were supported to develop interventions to improve existing approaches to teacher-student feedback; participants were required to ensure that their interventions were informed both by the research they engaged with in workshop one, their personal practice-based knowledge and experience, and/or the knowledge and experience of others. To aid this process, par-

ticipating teachers were introduced to the idea of theories of action (ToAs) and how ToAs can be used to construct research-informed interventions with clear pathways for change. Participants were then introduced to effective ways of trialing new innovations, such as lesson study, and left the workshop with the expectation that they should test their approach between workshops two and three (with the refinement and wider roll-out of their intervention occurring between workshops 3 and 4) (further detail on the types of activities covered in workshop two can be found in Brown (2017). Teachers were also supported to understand the impact of their actions and taught how to collect evidence related to their ToA and the desired changes they hoped to see. The research undertaken alongside these activities thus not only sought to explore if and how these activities helped participating teachers develop impactful research-informed interventions, it also draws on teachers' evidence of impact to assess the effect of the program on student outcomes. It was also intended that this research should provide insights and lessons into effective ways to facilitate RITP moving forward.

Research aims and questions

This study examines the extent to which the activities described above: 1) supported teachers to engage with educational research on effective feedback and related subject areas; 2) aided teachers to use this research to develop research-informed interventions for their classrooms with clearly defined pathways for change and impact; and 3) led to participants believing the strategies developed as a result of this model had an impact on teaching and learning. This article addresses three specific research questions:

- Research question 1: Did the activities help participants engage with the research in question and relate it to their context, setting, and area of practice?
- Research question 2: Did the activities help participants develop research-informed interventions with contextually specific pathways for change and impact?
- Research question 3: Did participants perceive that as a result of these activities, they were developing interventions that made a difference to teaching and learning? How and why?

A mixed-methods approach was employed to address these questions. Pre- and post-intervention surveys were conducted, and in-depth semi-structured interviews were conducted after the intervention to collect data.

It should be noted that the first author of this article both designed the intervention and conducted the evaluation. This raises a potential bias issue, however, the intention of the first author was to assess whether the evaluation was effective and, if not, how improvements could be made. The noteworthiness of the findings led to the writing of this article. Furthermore, the evaluation was based on data that teachers themselves were using to assess the effectiveness of their approaches; the fact that some teachers were more successful than others indicates that there was little if any social desirability bias in their responses, since their primary focus was the continued improvement of the new practices they had developed.

Analysis

A total of 15 teachers and school leaders (representing the whole of the federation's teaching staff) were interviewed in July 2017 a month after the final workshop. The characteristics of the respondents are set out in Table 1. In keeping with the work of Etienne Wenger, Beverly Trayner, and Maarten de Laat (2011), research respondents were asked to provide impact data relating to their interventions to help triangulate their responses and provide a level of objectivity to their accounts. Furthermore, the pre- and post-intervention surveys relating to the teachers' use of research provided further insight into respondents' perceptions relating to research use (surveys were undertaken before interviews were held). The questions from the survey, as well as the responses provided, are set out in Table 2.

Table 1: Characteristics of the interview respondents

Gender	14 female, 1 male
Average time in post	10.5 years
Average age bracket	41-46
Number with post-graduate qualifications (e.g., Master's degree, PhD, etc.)	5
Middle or senior leaders	6

Table 2: Pre- and post-survey questions and responses

Question*	Pre-response (average)	Post-response (average)	Difference (average)
1) How secure is your knowledge of research methods?	2.8	3.6	0.9
2) How confident are you relating academic research findings to your practice?	2.8	3.8	1
3) How confident are you having conversations about academic research?	2.9	3.8	0.9
4) How confident are you around interpreting academic research findings?	2.6	3.7	1.1
5) How secure are you using academic research to inform the design of teaching and learning strategies?	2.5	3.5	1

*Respondents were asked to rate their knowledge and skills against a five-point scale, with 5 equalling high, 3 equalling average, and 1 equalling low/none.

Interviews were recorded and transcribed. Data from the recordings were thematically analyzed in a process that also considered the impact and survey data. For each question, inductive analysis was initially used to provide a categorization of responses. Once all data was coded this way, meso-level codes were constructed to enable initial codes to be adequately explained in a conceptually meaningful way. This process was repeated using inductively developed macro-level codes to organize the meso-level codes (Lincoln & Guba, 1985). Macro-level codes were then assigned to each interview question.

Findings

The findings from the surveys and interviews are presented below, organized by research question. For the sake of brevity, only macro-level interview codes are provided (the titles of these codes are set in italics below).

Research question 1: Did the activities help participants engage with the research in question and relate it to their context, setting, and area of practice?

Research respondents observed that the activities used within the workshops helped them engage effectively with the literature in the following ways:

1. By *providing access to research*: “[in the past] that’s the bit that I’ve found hardest with the inquiry, is accessing that kind of material ... knowing more where to go and accessing [research evidence] ... having access to that and time to read through things was really helpful” (Respondent #3).
2. By *having time to engage with research*. Similar comments about how the model provided time to engage with research included: “having those inset days made all the difference this year ... [in the past] when we were trying to fit it in, sometimes it didn’t happen, and we’d grab half an hour and it didn’t have the momentum” (Respondent #3). (Respondents #5, #8, #9, #10, #13, and #14 also made similar points.)
3. Through the *collaborative, discursive nature of the activities*: “[when] everyone read a little bit and then fed back and discussed it, I found that a much easier way to engage with the research ... to go through and talk about or to analyze together” (Respondent #2). “The communication and working as part of a team is important, if you can sit down with [research] and unpick [its meaning] together, I think that’s better than trying to work in isolation” (Respondent #7). (Respondents #10, #11, #12, #13, and #14 made similar points.) Moreover, the *structured and facilitated approach to research engagement* meant that participants felt they were able to engage more meaningfully with the literature (this was mentioned by respondents #2, #5, #9, #13, and #14).
4. By making it clear respondents were *encouraged to experiment and take risks*: “I think for me, it was the knowledge that it was okay to get it wrong. That didn’t matter, because it’s not necessarily about finding the answer” (Respondent #6).

Recent literature on how school leaders can support a research-informed environment within their schools highlight the importance of: 1) providing the necessary resources and structures (for example, time, space, and access to research); and 2) facilitating an effective learning environment that includes collaborative dialogue and promoting trusting relations that enable innovation through risk-taking (e.g.,

Walker, 2017). The interview findings seem to add empirical weight to these suggestions. It has also been argued that effective engagement with research will require teachers to understand the strengths and limitations of different research methods, contextualize research findings, and engage in learning conversations using research as part of collaborative process of designing new teaching strategies (e.g., Cain, 2015). These three requirements are reflected in survey questions 1, 2, and 3 in Table 2. While not based on an experimental approach (i.e., there was no counterfactual data for teachers not participating in the project), the data from the surveys does provide promising indications that respondents typically believed that their knowledge and skills had improved over the course of the project in all three areas. Average scores moved from below the mid-point score of three, or average, at the start of the project to closer to four, or above average, by its end.

Learningfield Federation teachers were indeed becoming research informed as a result of the approach: “there is [now] evidence-informed professional conversation all the time. People have been far better about the idea of providing evidence for what they’re saying” (Respondent #1). “[We’re] actually beginning to embed the fact that everything we do, should actually be shrouded in research ... and that’s what we’ve got to continue doing” (Respondent #8).

Research question 2: Did the activities help participants develop research-informed interventions with contextually specific pathways for change and impact?

Analysis of the interviews suggests that all respondents could set out a *ToA for their developed intervention*: they were able explain the nature of their intervention, the logic of its design, how it should be actualized, and the changes it was intended to bring about. An example of one such pathway for change is set out in Table 3. Here Respondent #4 deconstructs the nature of their intervention in detail, including both intended and actual changes in knowledge and practice, as well as providing evidence on the resulting impact on students. The other examples provided by interview respondents are similar in detail and length, making it impossible to reproduce them all in a single journal article.

Table 3: An example of one respondent’s conceptual use of research

Domain	Respondent #4
Problem or driver for intervention	Highfield School had been tasked with supporting more children to exceed expectations in writing. For our early year’s children, we felt that this wasn’t going to be reached through more handwriting practice or more time sat at tables ... something else must happen before children would exceed in their writing.
The intervention	We had noticed over [a number of years] that many children were fearful of failure, getting things wrong or not being able to achieve something, and this was inhibiting them in taking risks in their learning. They would keep doing what they could easily do rather than taking a risk with something new or tricky that might possibly go wrong. We felt that this may well be what was preventing our children from exceeding. Our intervention was informed by Carol Dweck [research into growth mindsets]. From this work we hypothesized that if we were able to change children’s feelings and attitudes toward failure, struggle, and getting things wrong, then they would be more likely to take risks in their learning.

Table 3 (continued)

Domain	Respondent #4
Activities and interactions	We have introduced the idea of being a “brave learner.” This has not just been applied to writing and maths but to all aspects of learning and being. We have created two brave learner characters and identified the characteristics of being a brave learner. Children are awarded a certificate when they have been a brave learner, and their picture is added to our brave learner display board in school.
Learning	The teachers involved better understand the need to show to children that getting it “wrong” is part of the learning process and only by having another go, changing strategies, or practicing will they get better. Failure and getting things wrong are part of the learning process. They now also have an understanding of the need to give children a language to articulate their feelings while learning.
Changes in behaviour	When a child has been awarded a certificate, we now talk about how the child felt about the struggle they had to be a brave learner. We now praise their effort and resilience and their endurance, not whether they were successful in their quest.
Difference	Over the last six months we have seen a huge change in the attitudes of our children. They talk about being a brave learner and when we, the adults, talk about needing to be a brave learner, they know what they have to do. They also talk about how they and others have been or need to be brave learners. We feel our brave learner program has impacted positively on all children's attainment in writing, especially for those for whom writing has been a struggle. The children have begun to understand that struggle is part of learning, not an indication they will never get there.

All respondents noted that *ToAs were helpful* in how they applied research to their setting. Respondent #3, for example, suggested that the ToA approach had helped her realize the importance of being systematic and rigorous in how interventions are developed, baselines are established, and impacts are assessed. Furthermore, if interventions were not delivering the desired impact, refinements could be undertaken by *reexamining the logic set out within the ToA* and exploring whether its constituent parts were being implemented or supported effectively. This was also reflected by Respondent #5, who noted that employing a ToA-type approach made it possible to systematically explore the problem, what they were doing about it, and what had changed. Alternatively, the *ToA approach can be used to help refine interventions* that appear to be unsuccessful: “It also helps you address ‘Well, actually, it didn’t work, so where do I go now?’... So, it opens up another question on where you’re looking at” (Respondent #12).

Other key points emerging from this research question highlight that the interventions developed by respondents were fully grounded in the research they engaged with in workshop one. In other words, *research was being conceptually used*. In particular, three respondents could specifically identify the author or the title of the research underpinning their intervention (see Table 4). Others could not recall the name of the research(er) or the title of the research but they could describe what the research was about and its implications for practice. Furthermore, survey data suggests that by the end of the project, participants felt they had *developed the skills to interpret and then apply academic research* to the design of new teaching and learning strategies. Survey questions 4 and 5 in Table 2, for instance, indicate that over the course of the

project, respondents typically gained more confidence in interpreting research findings. They also reported a stronger ability to employ research effectively when developing new pedagogies. These responses reinforcing the suggestion that the interventions developed had a basis in the research introduced by the first author.

Table 4: One respondent’s impact statement

Impact domain	Impact text and data (Respondent #11)
Learning	The aim was to improve teachers’ understanding of the effective characteristics of learning, and whether this approach impacts on writing outcomes for summer-born children. Specific learning included “the approach has changed our perspective on the importance of some core skills [and has led to an] improved understanding of why [a] certain provision is important to specific groups and individuals. From our staff questionnaire, it is clear that teachers and teaching assistants all have a greater knowledge of the learning characteristics.”
Changes in behaviour	Changes in teacher practice noted by Respondent #11 included “changes to teachers’ planning activity—using characteristics of effective learning to move away from curriculum-specific foci”; “learning values are now driving teaching practice [rather than end-of-year goals]”; teachers were “more actively looking for effective learning behaviours and planning activities to develop these behaviours”; there was more of a general focus on “getting children to use the language of learning, so reflecting on their own learning”; and depending on the cohort/class, “we have had to change the focus from role play writing opportunities to individual interests ... we have also had to do much more fine/gross motor work.” In other words, teachers were also taking a differentiated, learning-centred approach, employing their understanding of the effective characteristics of learning.
Difference	Leuven Scale data shows greater engagement in learning by children; interview data with children suggests greater confidence and understanding. Parent questionnaires indicate that parents can see differences in their children’s writing. For example, one parent noted that “the forming of Jill’s letters and her interest in writing have both improved significantly.” Furthermore, the school’s writing data for 2015 highlighted that only 60 percent of summer-born children met their end-of-year early learning goals for writing. This compares to 83 percent of autumn-born children. Respondent #11 argued that the changes in practice noted earlier worked extremely well; ultimately leading to a rise in the number of children meeting their writing early learning goals: 86 percent in 2016 and 82 percent in 2017. In other words, sustained improvements of over 20 percent.

Research question 3: Did participants perceive that as a result of these activities, they were developing interventions that made a difference to teaching and learning? How and why?

For question 3, interviewee responses clearly indicated *changes in learning, behaviours, and outcomes for children*. Table 4 provides one exemplar response in its entirety. For other respondents, sample quotations that capture changes in practice and children’s outcomes are provided to show an illustration of what was achieved. For example,

Respondent #2's research question was, "If they're better risk-takers and they're more willing to try things, are their reading levels coming up?" Respondent #2's approach was to create "a small focus group [and to work with the group using] books and empathy of characters [to help them understand that] you can't learn without being uncomfortable, and all those sorts of things. So, break down the barriers and make them risk-takers, and that links with the empathy, because we're all in the pit at different times. Bar one, the whole focus group did get to [working above age-related expectations], so, it seemed to have been successful ... but I've been doing it with all of them. I think it's been, outside of that group, it's been effective, as well."

Respondent #5 noted that "there were six boys who I was trying to get to age-related expectations for writing, and at the beginning of the year they predicted that they might not make it. Out of that, four have made it, two haven't, so I guess the data is saying that it's more successful than not [in fact, the data showed that the four students in question had exceeded expectations]. The Talk for Writing [an existing and successful pedagogic approach] works in particular for stamina of writing. When [the students] arrived in September, their stamina and confidence to write at length was zero. The Talk for Writing just gives them the toolkit to do that ... it's been a good scaffold for them. It has helped them grow in confidence and ability."

Respondents #6 and #8 were working collaboratively on a feedback project. They noted that "using the Leuven capture sheet, it was clear that our focus children were slow to settle to a given task. Having checklist prompt cards and strategy cards [derived from research by Gibbs & Simpson, 2004] have certainly made things quicker and the children are all now engaged positively with their writing. The quality of writing has improved and outcomes in reading and writing [according to the end-of-year learning goals] are now significantly above average" (Respondent #8). Furthermore, data provided by these two respondents shows that the gap between the highest and lowest achieving students in terms of meeting or exceeding age-related expectations narrowed during the course of the project from 10 percent to six percent.

Finally, Respondent #12's project was designed to explore children's understanding of mastery with the aim of helping them exceed age-related expectations in writing and maths. It drew on research by Patrick Yarker (2016) and Daniel Schumacher, Robert Englander, and Carol Carraccio (2013). Two focus groups of children were selected and learning conversations were held about the notions of mastery. Subsequently, a language of learning was introduced across Year 1 to help children see mistakes as part of the learning process rather than a setback and understand that these mistakes could help them master their learning. Teachers and teaching assistants undertook the modelling of mastery language and skills. End of year data shows that the number of children in Year 1 meeting their age-related expectations for that year had risen from 76 percent to 83 percent in writing and from 83 percent to 92 percent in maths.

Conclusions and discussion

This article suggests that teachers' use of research tends to be conceptual rather than instrumental, while at the same time noting that requirements for research use tend to have a functional and measurable nature in order to deliver continuous quality

improvement. Correspondingly, this conception of RITP is achieved through an approach that can help teachers engage effectively with research evidence in order to adapt existing research/research-informed interventions such that they achieve the desired impact in the setting in question. The first author's approach for this has been to present research in order to make ToAs both visible and explicit, and to help teachers consider how to tailor research in order to ensure interventions operate most effectively in their own settings, while simultaneously helping them identify ways of measuring the impact of such interventions. This approach has enabled Learningfield Federation's teachers to successfully engage with research evidence on effective pedagogic practices. Perhaps more important, however, is that the article presents evidence to suggest that the effective scale-up of research-informed interventions is less to do with the instrumental replication of existing strategies and more to do with understanding why interventions have been successful and how that success might be realized in a new setting and context.

The world of education is full of examples of failed instrumental replication (Dede, 2016). Chris Bradford and Melissa Braaten (2017), for example, undertaking research into the centralized roll-out of an initiative referred to as "great teaching" note that, as a result of enforced instrumental replication, teachers involved in the initiative felt both unable to employ their professional judgement and were prevented from prioritizing what they valued and regarded as great teaching and learning. Ultimately this enforced instrumental use of a research-informed intervention served to demoralize teachers, but it also meant that the reform was only engaged with in a cursory way. Thus, great teaching never became fully integrated into existing pedagogy. At the same time, many academics continue to pursue strict notions of instrumental fidelity (e.g., Fixsen, 2017), insisting that once research has demonstrated that an intervention is successful, the intervention should be engaged with instrumentally and without deviation. The analysis in this article, however, starts to address how to resolve the apparent contradiction between instrumental research-use fidelity and the need for adaption that comes with the conceptual-functional engagement that typifies teachers' use of research (Klieme, 2017).

As a result, it is time to reconsider the importance of instrumental research-use fidelity to the scale-up of research-informed interventions. Or perhaps, to be more precise, to reconsider what fidelity really means and why it is important in relation to teachers' engagement with research. Specifically, if an approach has been developed in a given setting, there is no guarantee that it is either possible or desirable to roll out the exact same approach in the specificities of a different school. Instead what is needed is to find ways of achieving similar success by helping teachers tap into the same social drivers as the original research-informed intervention (assuming they hold in a new setting), but to do so by using approaches that are suitable to the resources available, the children being taught, the skills of the teachers in place, and so on. Fidelity then should be regarded primarily as fidelity to a ToA, but *in situ*—not necessarily to the specific way that theory of action has been operationalized.

In all cases, teachers were engaged with research that had examples of specific interventions that could have been implemented through instrumental means (e.g., Assessment for Learning Feedback or Talk for Writing). In all but one situation, teach-

ers engaged with the research in a conceptual way in order to develop an alternative intervention that worked best for them. In all situations, teachers reported impact in terms of their knowledge, their practice, and outcomes for their children. In other words, the data presented shows that this approach to helping teachers engage with research appears to have been impactful. In some cases, this impact appears to be substantive (see Table 4). Although this impact was due to the use of the approach detailed, the current research design is not possible to definitively attribute impact in this way alone. Nonetheless, in an age when governments are increasingly encouraging teachers to once again be professionals, it is important to work with teachers to build their capacity so they have a choice: rather than simply follow, they can actively create and define where doing so is likely to be more effective. To push forward this message in a way that will deliver change, however, a large-scale evaluation of this model should be undertaken to understand whether it truly makes a difference to both teaching and student's learning outcomes.

Note

1. Symbolic research use, which is generally thought of as the use of research to post-hoc rationalize a given decision, is ignored for the purpose of this article.

Websites

Best Evidence Encyclopedia, <http://www.bestevidence.org/>
 Campbell Collaboration, <https://campbellcollaboration.org/>
 Education Endowment Foundation Teaching and Learning Toolkit, <https://educationendowmentfoundation.org.uk/>
 What Works Clearinghouse, <https://ies.ed.gov/ncee/wwc/>

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