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Teacher-researcher collaboration in animal-assisted education

Teacher-researcher collaboration in animal-assisted education: Co-designing a reading to dogs intervention

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Abstract

Background Animal-assisted Education (AAE), including Reading to Dogs (RTD), is an area of growing interest internationally across all phases of education, and increasingly considered an innovative approach to improving pupil outcomes. As creating RTD interventions necessitates a combination of expertise from the fields of education and human-animal interactions, finding effective ways to achieve collaboration in RTD intervention design is imperative.

Purpose We sought to develop and work within a collaborative framework in order to co-design an AAE intervention, drawing upon researcher and teacher knowledge, experience and expertise. Our specific collaboration had the goal of co-designing an RTD intervention focused on supporting primary-aged children's reading and wellbeing. This paper describes the co-design process, and our evaluation of the collaborative process and framework.

Methods Three teachers, from different school contexts and educational authorities, and a researcher engaged in a structured co-design process to create the RTD intervention. A three-phase co-design framework was developed, implemented and evaluated. The framework ensured that theoretical and empirical research (via the researcher) and professional and pedagogical expertise (via three teachers) informed the intervention design.

Findings The three-phase framework – initial preparation, recruitment and online platform creation, and intervention co-design – enabled a productive and meaningful collaborative process which led to the development of an RTD intervention informed by a synthesis of research and practice. In our evaluation, the collaborating teachers were very positive about the framework, reflecting that it provided effective facilitation of the co-design and observing that working with teachers from other authorities offered a valuable and motivating learning opportunity.

Conclusions The co-design of interventions by researchers and teachers offers a way to synthesise theoretical and empirical research insights with professional and pedagogical expertise. It can help to create interventions that are research-informed but also more likely to be acceptable to the education community and feasible for classroom practice. This framework could be drawn upon by researchers, teachers and school leaders across a range of disciplines who seek to develop AAE and other interventions collaboratively.

Keywords

Introduction

Animal-assisted Education (AAE), including Reading to Dogs (RTD), is an area of growing international academic and pedagogic interest across all phases of education, and increasingly considered an innovative approach to improving pupil outcomes (Brelsford et al. 2017; Hall, Gee and Mills 2016; Reilly, Adesope and Erdman 2020). As creating RTD interventions necessitates a combination of expertise from the fields of education and human-animal interactions, finding effective ways to achieve collaboration in RTD intervention design is imperative. Collaboration between educational researchers and teachers is increasingly recognised as essential to raising educational standards and improving pupil outcomes (Beveridge, Mockler and Gore 2018; Bevins and Price 2014; Bleicher 2013; Mujis 2015; Nelson 2019; Rönnerman and Salo 2012; Scottish Government 2019). This paper details the creation of a framework for the co-design of AAE interventions, in which teacher expertise in curriculum and pedagogy, and researcher expertise in human-animal interactions and AAE are combined. This paper focuses specifically on an intervention co-design process in the context of designing an RTD intervention, and an evaluation of the process and framework; it is not an evaluation of the intervention itself.

Background

Animal-assisted Intervention (AAI) is the umbrella term used to describe goal-oriented structured interventions incorporating animals, and can be used within education (AAE), health and social work (IAHAIO 2018). RTD is an AAE intervention where a child, or group of children, read to a dog, often in the school context. The term 'wellbeing', while difficult to define absolutely (Bache and Scott 2018), is increasingly used in school contexts to signify

positive emotions and affect. The term 'affect' refers to emotions or feelings and how they influence actions and decision-making (Alexander et al. 2021). Dogs can help to motivate children in reading by taking the role of non-judgemental companions, thereby decreasing anxiety, and increasing motivation and confidence during reading (Brelsford et al. 2017; Hall, Gee and Mills 2016; Reilly, Adesope and Erdman 2020). Children's wellbeing is supported through perception of the dog as unconditionally accepting and valuing the child (Anderson and Olson 2006), decreasing stress, and acting as a social lubricant, thereby supporting positive social classroom experiences (Klotz 2014; Wells 2009). While some structured RTD interventions exist (Lewis and Grigg 2021), most current RTD practice lacks the educational goal-centred structure of AAE and is more informal and recreational in nature (Lewis and Grigg 2021).

Challenges in AAE research

While research into RTD shows positive outcomes for reading and wellbeing (Brelsford et al. 2017; Hall, Gee and Mills 2016; Reilly, Adesope and Erdman 2020), methodological weaknesses make it difficult to generalise findings. These weaknesses include failure to: specify intervention parameters (e.g. location and length of intervention, and type of dog); state the children's developmental status (or whether provided to children of lower reading ability only); perform quality post-intervention evaluations; manage risks around child and staff safety, and animal welfare (Brelsford et al. 2017, 2020; Fine, Beck and Ng 2019). The lack of methodological rigour in studies to date is particularly concerning given the increase of AAE in schools (Brelsford et al. 2020) and concerns over exaggeration of the benefits of AAIs (Fine, Beck and Ng 2019; Serpell et al. 2017). According to Fine, Beck and Ng (2019), AAIs are entering a new era wherein increased rigorous scientific research is needed to elevate them

from their current somewhat novel status, with benefits assumed to exist without research evidence, to scientifically proven research-informed interventions.

Part of the challenge in AAE research is its interdisciplinary nature, and the need for collaboration across disciplines. While AAE researchers have expertise in mechanisms of RTD, they are not necessarily expert in school contexts or educational practice, including in-depth knowledge of teachers' and school leaders' considerations when deciding whether to engage with new or unfamiliar educational programmes or interventions. For example, teachers may have practical concerns about managing curriculum demands and excessive paperwork, which could impact RTD adoption and implementation. Furthermore, as RTD involves the introduction of a live animal into the classroom, teachers may be concerned about the health and safety of children/staff (e.g. allergies, bites) and dogs (i.e. welfare needs) (Steel, Williams and McGeown 2021; Brelsford et al. 2017, 2020; Hosey and Melfi 2018; Lewis and Grigg 2021; Serpell et al. 2017). The need for careful collaborative planning in the design, production and implementation of all AAE interventions is therefore essential.

Teacher involvement in RTD intervention design

The co-design of RTD interventions by AAE researchers and teachers would ensure that interventions are informed by AAE research *and* pedagogical practice. Teachers' involvement in the design or production of educational interventions in general has long been noted as too limited (Campbell and Levin 2013); this is also the case in the development of AAE or RTD interventions. Hall, Gee and Mills (2016) have called for researchers and teaching practitioners to work together to make sure that any benefits of RTD interventions are maximised, and Brelsford et al. (2017, 2020) have urged the formulation and adoption of clear protocols for risk management and practice in AAIs. Despite the growing adoption of AAE and RTD in schools, and although Lewis and Grigg (2021) provide examples of risk assessments and

programmes that can be used in AAE, no standardised guidelines or risk assessments exist for managing RTD interventions, with individual organisations providing their own guidelines in an unregulated manner (Brelsford et al. 2020).

Teachers' perspectives on RTD are crucial to the development, adoption and implementation of RTD interventions. Steel, Williams, and McGeown (2021) conducted a survey of UK primary school teachers, seeking their views of the benefits and challenges of RTD, and their experiences. They reported that most teachers, particularly those with experience of RTD, were generally very positive about the benefits, and while they acknowledged challenges, these were not seen as a barrier to implementation. Furthermore, teachers provided valuable insights about optimal contexts for RTD and views on which groups the intervention might benefit specifically. These practical reflections could help inform the co-design of an RTD intervention: by working with teachers more closely, AAE researcher knowledge could be combined with teacher curricular and pedagogical knowledge, thus strengthening the intervention and increasing the likelihood of uptake and adherence to the intervention (Moir 2018).

While a few further examples of seeking teacher views about the benefits of AAE exist in the published literature (Bassette and Taber-Doughty 2013; Daly and Suggs 2010; Kirnan, Siminiero and Wong 2016; Rud and Beck 2003; Smith 2009), none explores the practical challenges of RTD interventions in the classroom. Crucially, while these studies highlight teachers' views of RTD interventions and AAE more broadly, they fall short of engaging with teachers to incorporate their teaching expertise in the development of RTD interventions for children. AAE interventions are often developed by researchers or organisations providing the service, without teacher input, and may not be particularly goal oriented or structured. For example, RTD usually takes the simple form of a volunteer and their dog sitting next to a child who is reading, with no research-informed intervention to accompany the practice or rigorous

evaluation process. Involving teachers as collaborators in a structured co-design process within a specifically-developed, facilitative framework in order to create a comprehensive RTD intervention has not, to our knowledge at this time, been reported. There is, therefore, a need to develop a collaborative framework for co-designing RTD and other AAE interventions which draws upon researcher and teacher knowledge, experience and expertise.

Theoretical basis for intervention co-design

The interpretive framework underpinning the co-design approach is social constructivism, whereby knowledge and understanding is constructed collaboratively as a result of interaction (here, between researcher and teachers) (Burr 2003). While teachers' views and subjective experiences inform the process, knowledge is socially constructed via interaction. This approach allows key stakeholders to combine theory and research with contextual understanding of classrooms, thereby facilitating more successful adoption and implementation of the intervention (Reed et al. 2020). Teacher-researcher co-design offers an opportunity to close the gaps between theory, research and practice (Bevins and Price 2014). When collaborating on AAE intervention design, research knowledge and the underpinning mechanisms of AAIs can be interwoven with the pedagogical and practical knowledge of teachers from diverse contexts, strengthening the intervention design and optimising adoption and implementation (Moir 2018). Furthermore, co-design promotes a culture that respects teachers' voices and professional knowledge (Cai et al. 2018; Priestley and Drew 2016, 2017) and aligns with the ethical and democratic rights-based approach (Coghlan and Brydon-Miller 2014; Jacobs 2016) evident in much modern educational policy (Osler 2015; Scottish Government 2016; UNICEF 2007).

Collaborative Action Research, implementation science and co-design frameworks

Collaborative Action Research (CAR) is an internationally recognised model of partnership working which aims to improve pupil outcomes (Coghlan and Brydon-Miller 2014; Juma, Lehtomäki and Naukkarinen 2017; Kijkuakul 2019; Wang and Zhang 2014), while implementation science focuses on the optimal way to introduce, deliver and embed research-informed educational interventions in school and classroom contexts (Moir 2018). Both are considered a way to bridge the gap between research and practice (Fixsen et al. 2005; Kelly 2012; Meyers, Durlak and Wandersman 2012). Co-design/production frameworks highlight the importance of creating synergies between research and practice to enhance intervention acceptance and efficacy (Hawkins et al. 2017; Reed et al. 2020).

Within CAR, teachers are considered education experts with valuable research contributions to make. Teachers and researchers have differing roles, responsibilities and perspectives on the issues and contexts involved in co-designing interventions: thus, CAR could be beneficial in pursuing the common goal of the design of an RTD intervention (Coghlan and Brydon-Miller 2014). CAR/co-design provides the additional function of offering all participants the opportunity to engage in professional learning and development while they learn from and with each other in the collaborative process (Coghlan and Brydon-Miller 2014). By synthesising teachers' pedagogical knowledge of reading and wellbeing interventions with AAI research expertise, RTD interventions that fulfil pupil and classroom needs can be designed, while researchers can simultaneously examine AAE interventions within a real context (Bevins and Price 2014).

Implementation science is relatively new to education (Moir 2018), yet many elements are relevant when considering educational intervention co-design (Kelly 2012). Co-designing AAE interventions with teachers allows them to provide important insights into potential obstacles to implementation and fidelity (e.g., feelings about dogs, cultural considerations, attitudes about the perceived efficacy of RTD, practical resource limitations) (Steel, Williams,

and McGeown 2021; Kelly 2012). Hawkins et al. (2017, 9) cite the benefits of co-production as 'maximising the acceptability, feasibility and quality' of an intervention and 'its fit with the implementation context' . Indeed, the need for implementation science in education is born out of recognition of 'evidence-based' programmes failing to transfer successfully into real world educational contexts (Kelly 2012). Interventions designed without taking account of teachers' views and knowledge of classroom contexts are less likely to be adopted in the long term (Gu and Day 2007; Moir 2018; Scanlon, Schumaker and Deshler 1994).

More generally, the concepts underlying co-design, its applications and related considerations are described and discussed across the rich literature in this broad field, including, for example, design-based research (Brown 1992; Anderson and Shattuck 2012), and collaboration between teachers and parents (Honingh, Bondarouk and Brandsen 2020). Meyers, Durlak and Wandersman (2012) reviewed co-design frameworks from multiple disciplines (including education), postulating that the process of implementation should be conducted systematically, with aspects such as collaboration and negotiation crucial to achieving the desired goals of a new intervention.

For the purposes of our own study, we considered that Hawkins et al.'s (2017) collaborative framework provided a particularly helpful underpinning approach for the educational co-design/production that we sought to create.   Hawkins et al. (2017) developed and trialled a successful framework for the co-production of public health interventions, which recommends that authors first conduct an evidence review, and then consult stakeholders through meetings, focus groups, emails and interviews before co-producing new intervention activities within a development group.

Purpose

The purpose of the study reported in this paper was to develop, implement and evaluate a teacher-researcher collaborative framework for co-designing an AAE intervention. The project involved one researcher and three teachers co-designing a RTD intervention aimed at improving children's reading affect (e.g. increasing reading motivation and confidence, and reducing reading anxiety) and wellbeing. After the co-design process was complete, an evaluation of the process was conducted. The study brought together research expertise in developmental psychology, reading development and animal-assisted interventions with teachers' expertise in classroom practice, in order to collectively to develop a RTD intervention for primary school children. As noted above, the rationale for co-design draws from CAR and implementation science and the methodology from co-design/production in health interventions (Hawkins et al. 2017).

Method

Ethical considerations

Ethical approval was granted by the University of Edinburgh, Moray House School of Education Ethics Committe on the 6th May 2020 and British Educational Research Association ethical guidelines were adhered to (BERA 2018). Informed consent was sought from teachers, following the university's ethical guidelines. Teachers were sent a Participation Information and Consent Form explaining the co-design process and including clear statements concerning confidentiality and anonymity. A Memorandum of Understanding (MoU) form, to agree co-design terms and protect intellectual property, was signed by participants. All data was stored on the University of Edinburgh's X's approved data storage drive.

Participants

Three fully qualified teachers were identified and recruited via a range of teacher networks. During teacher selection, diversity with regard to teaching experience (e.g. years, previous roles, current role), specific areas of expertise (e.g., literacy, wellbeing) and current school context (e.g. size, pupil demographics, location) were prioritised. Some degree of experience of RTD was also required. The teachers recruited were all female, and brought three, four and 20 years of teaching experience respectively. One held a junior management position, and one had previously been a deputy headteacher. All had varying degrees of experience of RTD: one had had a visiting dog in her classroom, another had conducted previous research into the impact of dogs on self-regulation, and the third had both conducted a dissertation on RTD and been instrumental in introducing RTD to her current school. All three teachers had particular expertise and responsibility in supporting wellbeing, and two had particular expertise and responsibility in supporting reading and literacy. The teachers were recruited from three different school contexts and educational authorities (one rural, one rural and urban combined, and one urban) from across the country. All teachers had experience of, or were currently teaching, children aged 8-11, which was the target age range for children to receive the RTD intervention that was being co-designed.

Procedure

A three-phase framework was developed in order to co-design the RTD intervention. These phases were: 1. *Initial preparation; 2. Recruitment and online platform creation* 3. *Intervention co-design.* The findings section presents a full account of the development, implementation and evaluation of the co-design framework, giving details of each phase of the co-design process.

Questionnaire

To evaluate the co-design framework from teachers' perspectives, a short questionnaire was emailed to the teachers at the end of the co-design process (see Appendix). A questionnaire, rather than interviews, was used as it allowed teachers to reflect, in their own time, on their experiences of the co-design process. It invited qualitative responses about different aspects of the process, informed by the literature on collaborative frameworks. With research and collaboration recognised as important to improving pupil outcomes (Beveridge, Mockler and Gore 2018), it is essential that the most effective way to collaborate on intervention co-design is developed. Therefore, not only was it right to seek teacher views from an ethical perspective, but it was important to find out whether the teachers considered that the framework was fit for purpose. The aim of the questionnaire was to ascertain the teachers' perspectives on whether the entire co-design process had been effective, not only in meeting the end goal of designing the intervention, but in being an efficient, meaningful and engaging process in which to participate.

Findings

In this section, we present a phase-by-phase description of the co-design framework, in terms of its development, implementation and evaluation. Evaluative feedback from the co-designing teachers, which we collected via the questionnaire at the end of the process, is included in our description for each phase.

Phase 1: Initial preparation

This initial phase involved the development of teacher research/policy brief and the creation of co-design/intervention parameters. These activities are explained in more detail below, after which the evaluative feedback is presented.

Development of teacher research/policy brief: To ensure that the teachers acquired a suitable depth of knowledge of theory and research underpinning RTD interventions (Durlak 2016), a concise teacher research/policy brief of research evidence on RTD was prepared by the lead researcher (LR) (the first author of this article). This was based on a comprehensive

literature review drawing upon recent systematic reviews (Brelsford et al. 2017; Hall, Gee and Mills 2016) and subsequent empirical research (both descriptive and experimental). Furthermore, to make connections between RTD research evidence and teacher practice, links to existing government and educational guidelines, policies and resources to support reading and wellbeing in the country where this RTD intervention was designed were included. The teacher research brief included a summary of the context and theory, a synopsis of RTD research evidence, and potential intervention components to incorporate into the new intervention.

Creation of co-design/intervention parameters: To ensure that the co-design process and intervention were feasible within the resources available for the project, parameters were set by the LR, including co-design duration and intervention-intended goals. The LR also proposed discussion topics including potential activity ideas and texts, and opportunities for interdisciplinary learning such as science, art, animal welfare. However, it was made clear that these topics could be changed depending on teacher and group contributions. During the creation of these parameters, a key concern was the time commitment requested of teachers due to widely acknowledged high teacher workload (Higton et al. 2017; Farrell 2004). Therefore, the period allocated to co-designing the intervention was relatively short (approximately 12 hours over six weeks including preliminary contact), to make sure that teachers could commit fully to the project. Ten hours of teachers' time was allocated to Phase 3, which was deemed to be practical in terms of balancing teachers' availability with the contribution required to co-design the intervention. In total, four one-hour online meetings were arranged over a four-week period to design the intervention, with a further six hours allocated for asynchronous contributions to the shared folder.

Evaluation of phase 1: In the questionnaire, the co-designing teachers were asked to comment on the information sent out in advance (i.e. the research/policy brief) and the creation

of parameters, and whether they found these clear and helpful. The teachers' responses suggest that the Phase 1 materials were effective in creating clarity with regard to the intended outcome of the project, roles within the co-design process and expectations, with teachers reflecting positively in this regard. Feedback included 'The information I received prior to the meetings clearly outlined what the research project was about, who would be involved, and the intended outcome' and 'The information was clear and detailed. I knew what to expect right from the start. Communication has been good from start to finish'. Indeed, good communication is widely recognised as crucial to effective collaboration (Beveridge, Mockler and Gore 2018). Providing the teacher research/policy brief and statement of co-design/intervention parameters in advance enhanced the meetings and encouraged the teachers to ask insightful questions which stimulated discussion and ideas (Ewing et al. 2010), as confirmed by this teacher: 'I understood what my role was each week. I felt this enabled me to participate actively in the project'. The teachers felt that the research brief contributed to the co-creation of clear intervention components and content (Beveridge, Mockler and Gore 2018); for example, as one of the teachers noted, 'I felt that I had a good understanding of the research to date, and I understood the intended purpose of the resource which was to be developed'. The LR also felt that both processes were essential to ensure that the teachers had sufficient research knowledge and that all three had a shared understanding of the parameters of the project, which were, to some extent, restricted by project resources.

Phase 2: Recruitment and online platform creation

As detailed below, the second phase involved the recruitment of the co-design team, and the preliminary consultation and online platform creation.

Recruitment of co-design team: A key factor in the co-design was the complementarity of skills and expertise within the team. The authors and LR are researchers in primary school

education, child development, reading development, and human-animal interactions. The LR, a former primary school teacher, led the co-design team, and the three practising primary school teachers who were recruited brought complementary and unique expertise and experience. The knowledge and experience of individuals within the team needed to be sufficiently varied to ensure everyone contributed something original and distinct. Co-design team size is an important consideration; a team of four in total (i.e. the LR and the three teachers) was considered optimal for the planned co-design activities. As the intervention was co-designed online, this allowed considerable flexibility in terms of geographical location of the teachers, allowing teachers working across different local authorities to be recruited for the project.

Preliminary consultation and platform setting: Once they had given informed consent, the teachers received a pack including the teacher research/policy brief, co-design/intervention parameters (both evaluated in Phase 1), and a request for further information (see *Participants* section above). A seven-day period was allowed for teachers to read and review all information, and to ask the LR any questions before deciding whether or not to participate. Due to COVID-19 and the geographical locations of the co-design team, an online platform to facilitate co-design meetings was created. This was set up on a secure university system, which also afforded the LR the means to record the meetings (agreed with the entire team, approved by ethics) for transcription.

Evaluation of phase 2: Online meetings allowed teachers working across diverse settings to be able to share experience and ideas (Kim 2020), which aligned with a recruitment priority. Indeed, this emerged as a key benefit in teacher feedback; one teacher noted 'as we were teachers from across Scotland this seemed the ideal way to meet' and another observed 'so valuable for providing an easy and meaningful way to communicate with those who are further afield'. In addition, teachers reported interest in work taking place in other schools and

authorities, explaining that they had been provided with ideas to take back to their own schools. This highlights the benefits of collaboration among teachers working in diverse contexts (Greany et al. 2014), as these three quotations from the teacher feedback suggest:

> I enjoyed working with others from across the country with a shared goal in mind.
>
> It was great talking to teachers from other areas of [place] and hear about what they are doing.
>
> The most effective part for me was the opportunity to collaborate with others from a range of local authorities.

The online platform afforded many of the benefits cited by teachers. In the questionnaire, the three teachers were asked specifically to comment on the meeting medium and online platform. Findings indicate that they found the online mode of co-design to be generally very effective, with individuals commenting 'Worked efficiently. No particular need to meet in person' and 'I found it easy to join and communicate in this way'. However, one teacher reported her connectivity as being less than optimal - 'at times video and sound lagged but that might have been my personal internet connection' – which underscores the vital part that robust electronic infrastructure plays when conducting a co-design process via online meetings. In addition, one teacher suggested that a preliminary face-to-face meeting to begin the team relationship would be preferable, and under different circumstances this would be a valid option. The LR felt that the online meetings worked well, overall. The complementarity of the team, in terms of teacher experience, afforded to some extent by the online meetings, was a major strength of the co-design. The ability to record discussions to ensure no key information was lost was also beneficial.

Phase 3: Intervention co-design

The third and final phase involved the co-design via online synchronous meetings and asynchronous communication. From the outset of the co-design process, the LR took care to establish a relaxed and friendly rapport with the three teachers to mitigate any pre-conceived

power imbalances (Coghlan and Brydon-Miller 2014). The small group size assisted in this, contributing to an informal atmosphere where everyone took turns to speak whenever they desired, without the need to formally 'raise a hand', as may be the protocol in larger online meetings. Prior to the first meeting, a shared secure folder was created as a place to store, share and amend resources as the intervention was being developed. Before each meeting, the LR uploaded an agenda to the folder make sure that all necessary content was available and that decisions could be made during the meeting. In addition, 10 minutes were allocated for unstructured discussion at the end of each meeting.

Prior to meeting 1, the LR had provided all teachers with the teacher research/policy brief, co-design/intervention parameters and discussion topics for the RTD intervention. In the initial meeting, the teachers discussed the content shared in the research/policy brief and suggested RTD practices and resources that would work in their own settings (e.g. suggesting texts and activities based on their existing knowledge and practice). Discussion of how to embed research findings in ways that were practical and feasible across diverse educational contexts continued for the four online meetings.

In addition to the online meetings, co-design of the intervention was ongoing between meetings (six hours) via asynchronous communication, as team members uploaded and commented on material in the shared folder. For example, teachers added guidelines, policies and resources, drawing upon those associated with their own authorities and schools. Ahead of the final meeting, the LR collated all the proposed ideas and created a summary sheet to be agreed upon during the final meeting.

Evaluation of phase 3: In the questionnaire to evaluate this process, the three teachers were asked to comment on what was most and least effective about the project in terms of their professional learning**.** They indicated that they found the process a valuable and enjoyable professional learning opportunity, in which they learned both from the LR and from each other,

and which they hoped would ultimately benefit both them and their pupils. These quotations are illustrative: 'I found it very interesting and would consider engaging in something similar in the future.' and 'I now have a deeper understanding of the benefits RTD can have on children's wellbeing and would like to use many of the ideas/strategies within my school and within my own teaching'. Furthermore, the teachers expressed a sense of fulfilment in being part of a novel PL team,: 'The experience was positive and has provided me with experience which I hadn't had before' and signalled enthusiasm at prospects for the resource they were involved in: 'I'm excited to see where it goes'. McLaughlin, Black-Hawkins and McIntyre (2004, 16) argue that teachers who engage in research have a 'better understanding of their practice and ways to improve it'. This sense was reflected in the teacher comments; for example: 'It was useful to talk about personal practice as it helps to consolidate this in your own mind and ensure the relevance and clarity of what you are doing' and 'Most effective was feeding off each other's ideas and discussing what is manageable in different settings'. Indeed, the three teachers alluded to how they welcomed the opportunity to be involved in research of this nature: 'It allowed me to work on a research project which is large-scale in comparison to my experience to date' and 'I have really enjoyed getting stuck into something with a research background'.

One teacher suggested it would be beneficial to be assigned a specific task with a view to presenting findings at meetings. While an allocation of tasks by the LR for asynchronous contributions was incorporated, in future, more structured contributions to the synchronous meetings may be an option. The teacher also expressed an interest in taking a larger role in a similar project in the future suggesting that, despite concerns about teacher workload (Higton et al. 2017; Farrell 2004), some teachers are, nevertheless, keen to take on research projects.

The questionnaire invited the teachers to comment on what was most or least effective about the collaboration and co-design. Only positive reflections were shared, which is perhaps

unsurprising given the participants' enthusiasm for engaging in this research from the outset. Nonetheless, findings point to the value of the collaborative sharing and developing of ideas, not only in terms of the quality of the resultant intervention, but as a professional learning experience (Coghlan and Brydon-Miller 2014; Durlak 2016); as one teacher reported, 'Most effective was sharing and discussing ideas and developing these ideas as a group'.

The teachers' positive views about collaborative working suggests they valued the opportunity to hear and to be heard in the sharing of their professional knowledge (Cai et al. 2018; Priestley and Drew 2016, 2017). They expressed the hope that their expertise and practical knowledge would contribute to the ultimate success of the intervention: 'As current practitioners we were able to provide some insight into how the project could be applied in a real-life context' and 'working in partnership with researchers ensures that practical issues are considered'. The three teachers saw the intervention not only as important for children's reading and wellbeing outcomes, but as important for teachers in terms of feasibility.

Finally, the facility to contribute both synchronously and asynchronously was also reported as advantageous; synchronous meetings were seen as simple and effective ('virtual meetings were efficient'), and it was noted that the asynchronous shared folder contributions afforded flexible engagement at a time that suited them best. Synchronous online meetings are most effective if complemented by other forms of collaboration, such as document sharing (Rubinger et al. 2020). While the three teachers were positive about document sharing, one teacher suggested the facility for all team members to screen share would be helpful: this could be readily facilitated in future online co-design groups. The LR found the collaborative process extremely helpful in gleaning a clearer knowledge and understanding of current and latest practice directly from the practitioners. The LR felt this contributed significantly to the co-construction of knowledge, and would help make the resultant intervention as effectual as it could be.

Discussion

It is clear that AAI researchers and teachers share the mutual goal of improving pupil outcomes (Greany et al. 2014) and that collaboration is crucial to achieving this goal (Beveridge, Mockler and Gore 2018). As is evident from the description of our process above, the three teachers who collaborated in our co-design expressed increased knowledge and interest in the field of AAE and RTD, and the desire for this to translate to improved educational outcomes for their pupils (Ainscow, Muijs and West 2006). The teachers were aware of the potential of the RTD intervention to benefit pupils, whilst keeping practical issues for implementation at the fore. By working together, optimal conditions were created to ensure the content (e.g. topic, relevance) and delivery (e.g. duration, frequency) of the intervention were not only research-informed, but also appropriate for the intervention recipients, both teachers and pupils (Carroll et al. 2007; Kelly 2012).

Teachers expressed value in hearing of each other's expertise and experience. Successful collaboration necessitates complementary knowledge and skills (Coghlan and Brydon-Miller 2014) and contributions made by everyone in the team, rather than focusing on the skills of any one member, are most influential in shaping successful collaborative projects (Platteel et al. 2010). The three teachers' views resonate with Platteel et al's. (2010) findings that the knowledge and skills of both teachers and the researcher team collectively and successfully build mutual capacity to achieve the aims of the project. The small size of the group for an interdisciplinary project of this scale felt optimal, ensuring everyone had an opportunity to contribute in the online forum, while keeping discussions focused and accommodated within the time allocated. However, particularly in a small team, it is important to ensure a breadth of experience and skills, group dynamics, mutuality and cohesion (Bevins and Price 2014). Common values, an explicit shared goal and a clear structure to work within,

appeared to be effective in creating this cohesive team. The teachers in our study were positive about the ease of communication and relaxed atmosphere, and felt comfortable sharing and offering input. Each member had expressed a particular interest in the topic before the first meeting, and this shared enthusiasm for the topic perhaps contributed to the natural way in which the team was productive, and provided opportunities to learn from each other (Coghlan and Brydon-Miller 2014). Overall, the success of this project rested not only on the knowledge, experience and expertise of the team, but also their ability to work well together.

As noted in our findings, the teachers in our study reflected positively about the preparatory information received, and the communication process throughout. However, challenges to researcher and teacher collaboration can lie within the contrasting contexts in which researchers and teachers work, their differing roles, priorities, motivations and, as mentioned above, particularly demands on teacher time (Beveridge, Mockler and Gore 2018; Moir 2018) due to high workload (Higton et al. 2017; Farrell 2004). Bevins and Price (2014) highlight time to collaborate as a key factor underpinning successful collaboration; therefore the period allocated to this intervention co-design was relatively short to ensure teachers could commit fully to the project. It is also important that researchers genuinely understand teachers' roles, responsibilities and requirements to build credibility and create alliances with teachers (Beveridge, Mockler and Gore 2018), as role expectations in collaboration can be misunderstood, due to poor communication, resulting in negative outcomes (Karagiorgi et al. 2015; Lendahls Rosendhal and Rönnerham 2006). In view of these difficulties, it was important to establish a structured platform in advance, specifying from the outset clear expectations through the accessible teacher brief and intervention parameters (Beveridge, Mockler and Gore 2018) - thereby also reducing the chances of misunderstandings caused by a lack of clear communication. By researchers, - who may have more autonomy in how they use their time (Bevins and Price 2014; Coghlan and Brydon-Miller 2014) - assuming the role of co-design

facilitator and providing the teacher brief in advance, the co-design framework ensured that teachers' time was productively channelled where it was most needed, in this way facilitating effective collaboration between participants and increasing likelihood of success (Durlak 2016).

The teachers articulated the benefits of researcher/teacher engagement in intervention co-design for professional learning (Greany et al. 2014; Nelson 2019). They reported the worth of hearing of work taking place in other schools and areas, expressing a desire to implement some of the ideas shared in their own diverse contexts. Teachers who engage in research have an enhanced understanding of their practice and how to improve it (McLaughlin, Black-Hawkins and McIntyre 2004) and teachers who value collaboration became more motivated (Earl and Timperley 2009), which is a notion reflected in the teacher feedback in the present study. AAI/AAE researchers can benefit professionally by collaborating in co-design with teachers (Beveridge, Mockler and Gore 2018), as collaboration enables a sharing and exchange of knowledge and experience, which can inform researchers' understanding of contextual factors and classroom practices. Therefore, during AAI researcher and teacher collaboration, particularly when teachers are from diverse schools and authorities, there is considerable scope for researchers' knowledge and understanding to be broadened (Ainscow, Muijs and West 2006; Muijs 2015), allowing for researchers to adapt their research accordingly.

Aligning with an implementation science approach, a key aim was to create a research-informed RTD intervention which could be introduced, delivered and embedded within classroom contexts (Moir 2018), with acceptability, feasibility and quality issues being key (Hawkins et al. 2017). The teachers' evaluations reflected these development aims as having been met through this co-design framework, and the LR felt strongly that they had, too. Of course, this is not an evaluation of the effectiveness of the RTD intervention itself: a robust

evaluation of the intervention once implemented in classrooms will be necessary to understand to what extent these aims have been fully realised. However, it is encouraging that both the LR and the three teachers felt very positive about the process and outcome.

Implications

Following completion of this process, we reflected on implications that may be of use to others embarking on co-design projects. We would strongly encourage researchers to prioritise consideration of teachers' time and availability in co-designing interventions, to make sure they are provided with the underpinning theory in advance, and to be very clear from the outset about expectations. That said, within any co-design team, contributors may be willing and/or able to contribute to different extents. While setting clear guidelines and expectations ensures parity and is recommended, providing some flexibility may allow some teachers to contribute more, should they wish and/or be in a position to do so.

While our project outcomes were achieved (i.e. core intervention components and comprehensive set of activities/resources were decided on, and an evaluation of the co-design process was completed), the creation of an entire RTD intervention which was ready for use (i.e. website, full activity/resource bank) was not completed within the co-design period. This was due to the time scale and additional expertise (e.g. website developer) required to facilitate the completion. Therefore, we would also recommend allowing time for a later follow up, so that the co-design team can review and comment on the final intervention.

Overall, the participating teachers saw great value in the collaborative nature of the process, recognising the diverse and extensive knowledge and experience that each brought to the team. All invited participants were teachers; however, in co-design teams requiring individuals across sectors (e.g. education, health), or different roles (e.g. school leaders,

teaching assistants) the level of cohesion found here may take more work and time to achieve. While the size of this co-design team was effective, larger teams may be more appropriate where a broader range of knowledge/expertise is necessary – for example, in larger interdisciplinary projects, or where input from individuals working in diverse roles within education (e.g. local authority leads, school leaders, teachers, etc.) is required. Furthermore, for selection and recruitment to the co-design team in this project, teachers' teaching experience, areas of expertise and current school context were prioritised. The careful selection of suitable teachers with complementary experience for the project was important, and we would suggest connecting with appropriate teacher networks (e.g. via social media teacher groups) to achieve this. However, different interventions may necessitate different priorities for teacher recruitment - for example, a broader focus on teacher diversity.

As the three teachers clearly felt they benefited from working with other teachers based elsewhere, geographically and contextually, we feel that this an important consideration to inform opportunities for future co-design projects. While issues such as a stable internet connection and restrictions in terms of how easily contributors can share written/visual information are important to recognise as potential challenges, overall the synchronous/asynchronous platform worked well. This leads us to believe that facilitation of broader online collaboration may be advantageous: certainly, insight into practices across different authorities and contexts is likely to be helpful from an acceptability and feasibility perspective. When reflecting on the entire co-design process from start to finish, the three-phase framework was found to be fit for purpose, requiring rather due consideration of all the aforementioned issues rather than major modifications. The RTD intervention itself will be evaluated in a separate study and has necessitated revisions for entirely online delivery due to COVID-19. Nevertheless, the underpinning activities and resources remain the same.

Limitations and other considerations

The scope of this study was small, including one researcher and three teachers, all of whom were very engaged and motivated in the process. The authors acknowledge that the positive feedback from participants may not be representative of the range of responses and reflections stemming from other co-design projects. It is important, too, to recognise that local context will always influence co-design processes in terms of the particular considerations that need to be taken into account (e.g. similarities/differences in pedagogical approaches; specific curriculum contexts): our project was geographically located in Scotland, within the curricular context of the Scottish Curriculum for Excellence.

Conclusions

This article describes the development and evaluation of a framework for a small-scale researcher-teacher collaboration to co-design AAE interventions. The three-phase framework drew upon theoretical and empirical research (via the researcher) and pedagogical and practical experience and expertise (via the teachers) in order to create an educational intervention which would be research-informed, while also being more likely to be acceptable to teachers and feasible for implementation. Overall, we reflected that the framework enabled a productive and meaningful collaborative process and led to the development of an RTD intervention informed by a synthesis of research and practice. Future research, in the form of a robust evaluation of this intervention in classrooms, is necessary to understand the effectiveness of the intervention itself. We offer our study as a resource for researchers, teachers and school leaders internationally across a range of disciplines, within and beyond the AAE context, who plan to work collaboratively to co-design a broad range of educational interventions.

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Appendix

Details of the short questionnaire completed by the teachers at the end of the co-design process.

WELLBEING AND READING: EXPLORING THE IMPACT OF READING TO DOGS
REFLECTIONS on the TEACHER CO-DESIGN PROCESS AND FRAMEWORK

Thank you very much for your involvement in this project. I am interested in your views on how the project went. Please complete the following questions and continue on another sheet if necessary.

NAME: DATE:
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1. Did you find the information sent about research to date prior to the meetings helpful? Please share reasons.

2. Did you find the virtual meeting platform worked efficiently?

3. Would you have preferred to meet personally? Why?

4. Did you find the meetings helpful to your professional development as a teacher? Please explain why.

5. What was most effective about the experience in terms of the resource co-production?

6. What was most effective about the experience in terms of your own professional experience and development?

7. What was least effective about the experience in terms of the resource co-design?

8. What was least effective about the experience in terms of your own professional experience and development?

9. Overall do you think that working in partnerships with researchers is potentially worthwhile in ensuring the product of the collaboration is meaningful and practical?

10. If given the opportunity, would you embark on such a project again? Please share your reasons for your answers.

11. What do you hope will be the impact of this project?

_____
_____