

RESEARCH

Tales of the unexpected: Teacher's experiences of working with children and dogs in schools

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Abstract

Globally, there are a growing number of dogs in schools. Research suggests that there are potential benefits of interactions between children and dogs in educational contexts, for example in terms of social–emotional, cognitive and physical development. However, there is a lack of research examining the potential challenges and limitations of involving a dog in school, particularly regarding the well-being of the dogs themselves. The present study investigated the experiences and perceptions of 453 educators around the world who have implemented a school dog program. The study found great variety in terms of the activities school dogs engage in. Despite respondents having positive perceptions of the benefits school dogs bring, many reported unexpected incidents from toileting and barking to more significant incidents such as growling and biting. This article highlights the relatively under explored tension between the practical, hands-on reality of including a sentient dog in the classroom, versus the ideas and expectations that teachers have about school dogs.

Keywords: school dogs, animal-assisted education, animal-assisted intervention, well-being

Introduction

Animals have featured in the school-based experiences of many children over many years, often providing engaging, real-life examples of the variety of life that can be found on earth (Mayer, 1980). Alongside a growing interest in animal-assisted interventions (AAI) within academic and therapeutic disciplines, animals are increasingly found in schools due to growing recognition of the contribution they can make to enrich children's well-being (Lewis *et al.*, 2022). Indeed, a specific area known as Animal Assisted Education (AAE) has gained widespread interest. In this article, we use the definition of AAE as 'a goal oriented, planned, and structured intervention directed and/or delivered by educational and related service professionals' (IAHAIO, 2018).

Many studies refer to the potential biological, psychological and social benefits of interacting with animals (e.g., Meints *et al.*, 2022). There is evidence to suggest that children choose to engage in relationships with animals because they are enjoyable, a source of fun and offer opportunity for purposeful play (e.g., Kerns *et al.*, 2023). Schools have often brought dogs into classroom lessons to reduce stress and support the well-being of the students, and there are two main models of practice – a resident 'school dog,' or

a 'visiting' dog working with a charity or other external organization. However, the practical aspects of having a dog present in the classroom are under researched, particularly when the dog is a resident 'school dog' (Lewis *et al.*, 2022). Indeed, little has been written about the prevalence of resident school dogs, their role, their hours of contact with learners and their selection or training. We also know less about what the positive experiences are for the animals, and there are potential ethical issues around whether a school dog is a companion, partner or 'worker' (e.g., Rawlings, in Peralta and Fine, 2021, p. 49). There are also limited studies regarding perceived risks such as hygiene and safety (e.g., Grov *et al.*, 2021).

This article therefore makes an original and significant contribution to knowledge in AAE by choosing to focus on some of the practical issues that teachers face when bringing dogs into their classrooms. It also illustrates the challenges and surprises that teachers may encounter when regularly choosing to include a dog in their classroom practice. By highlighting these possibilities, and making recommendations about how to address these, the article aims to better equip teachers to plan, prepare and implement approaches that meet the well-being needs of children, adults and dogs alike.

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Submitted: 13 September 2023. Accepted: 08 November 2023. Published: 07 December 2023

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RESEARCH QUESTIONS

This article aims to answer the following questions:

1. What sorts of activities do school dogs undertake, and with whom?
2. Do teachers report any unexpected, challenging incidents between the dog and people in the school?
3. If so, what is the nature of these incidents, and what recommendations should be made to minimize these?

TERMINOLOGY

In this article, the term 'school dog' refers to any canine involved in a school context for the purpose of contributing to children's learning and personal development. The term 'educators' describes those involved in providing some form of instruction, including teachers, teaching assistants, administrators (instructional leaders), lecturers, student teachers and external consultants. We also use the terms 'owner' and 'handler' when we refer to the people that deliver the AAE intervention. While we acknowledge that there is a debate as to how these terms may infer a lack of advocacy for some canines, we used terms such as owner in the questionnaire as we felt that they were familiar to the potential respondents. Most respondents were both the owner and the handler of the dog. We use the term 'children' or 'learners' to describe the children and young people receiving and participating in the AAE interventions.

What are the benefits of having dogs in classrooms?

Research into the impact of AAEs has focused on a variety of themes, such as pedagogy (Lewis and Grigg, 2021), psychological aspects of development (Kertes *et al.*, 2017) and therapeutic approaches (VanFleet and Faa-Thompson, 2017).

A recent international study of close to 1000 educators found that while a range of animals, from stick insects, goats and snails can be found in schools around the world, dogs were reported as the most popular animal involved in AAEs (Lewis *et al.*, 2022). Dogs are acknowledged to contribute to the development of emotional awareness, ease attachment issues (e.g., Carlisle, 2015; Jalongo, 2015; Meehan *et al.*, 2017), improve self-efficacy (Gruen *et al.*, 2017) and contribute to a sense of self-worth (e.g., Henderson *et al.*, 2020; Woehr and Newman, 2020), and can provide emotional support during reading or examinations (Steel *et al.*, 2021). In many studies dogs have assisted children with their overall attitude to learning, behavior and social interactions (e.g., Beetz *et al.*, 2012; Beetz, 2013; Schretzmayer *et al.*, 2017) and with the development of their verbal skills (e.g., Stevenson *et al.*, 2015; Smith and Dale, 2016).

Development of such aspects connects to the concept of 'flourishing,' defined by Keyes (2007), to include positive emotions, positive psychological functioning and positive social functioning. Flourishing is an indicator of positive mental health and is important for children's development and well-being (Hilton *et al.*, 2019). Gleason and Narvaez (2014) include physiological, emotional, psychological and social health in their notion of flourishing, and include an emphasis on the sociomoral aspects of development, such as strengths in empathy and cooperation. As such, flourishing is conceptualized with an emphasis on the moral domain, such that it includes considering how actions affect others and helps children increase awareness of the wellbeing of others (Gleason and Narvaez, 2014).

The presence of a dog may also support academic development. It has been suggested that classroom dogs could be an asset due to stress reduction, thereby increasing cognition skills, attention, motivation, self-esteem, self-efficacy and therefore ultimately school attainment (Gee *et al.*, 2010b; Gee *et al.*, 2015; Hediger *et al.*, 2017). Indeed, some studies have shown that young children (3–8 years) can follow instructions more accurately (Gee

et al., 2010b), have greater executive functioning (Brelsford *et al.*, 2020) and focus better when a dog is present (Gee *et al.*, 2010a). Recently dogs have been found to increase visuo-spatial skills for children, which can affect underlying skills for both writing and mathematics (Brelsford *et al.*, 2022).

Reading to dogs programs are well-established around the world. Children's reading skills have been studied both with and without the presence of a dog with differing results due to differences in methodological set ups and timings of the different interventions or methods used in the collection of data (Lenihan *et al.*, 2016; Henderson *et al.*, 2020). Nonetheless, surveying or questioning children, teachers and handlers usually give positive responses about the impact a dog has on learners in a classroom context (e.g., Noble and Holt, 2018). For example, while the pre-requisite skills for reading still need teaching (Beetz, 2013), the presence of a dog may lead to improved speeds of fluency, accuracy and ability (Wohlfarth *et al.*, 2014; Lenihan *et al.*, 2016; Schretzmayer *et al.*, 2017).

What are the challenges of having dogs in classrooms?

Unlike some countries, such as Norway, Austria (Beetz, 2013) or Bavaria (Bidoli *et al.*, 2022) within the UK and many other countries worldwide, there are currently no regulated, centrally organized training courses for teachers to prepare them for including a dog in their practice. Teachers are reliant on their own research, reading and independently sourced training classes. As there are no national guidelines to prepare for the dual role of teacher and dog-handler in many cases teachers are 'going it alone.' This raises questions as to how effectively interventions are implemented.

Safety must be the highest priority when allowing dogs and children to interact in schools. In the UK, there are schemes that are available to support the development of safe practices, such as the Blue Dog Project, Lead Risk Assessment and workshops from The Dogs Trust (Meints and De Keuster, 2009; Baatz *et al.*, 2020; Brelsford *et al.*, 2020). However, it remains up to the individual teacher to have the time to research and engage with these schemes and to develop their own school specific risk assessments and policies.

Educators consider basic safety and awareness issues, usually from a humanistic viewpoint which highlights allergies, children's skills in reading of dog body language, consideration of dog bite data and uses the familiarity and awareness of common dog behavior in general (e.g., Brelsford *et al.*, 2020; Meints *et al.*, 2022; Bidoli *et al.*, 2022). Only recently have observations of actual 'real time' dog behavior been considered (Baatz *et al.*, 2020; Bidoli *et al.*, 2022; Lee *et al.*, 2022), which advocate awareness from the canine perspective. Peralta and Fine (2021) argue that it is important to know individual school dogs well, so that their behavior in specific situations can be anticipated. To do this, Peralta and Fine (2021) advocate for close documentation of an individual dog's reactions in specific circumstances. However, this can be challenging in a busy school classroom, where teachers are also responsible for the close documentation, teaching and management of the children and young people in their care.

Therefore, there are still possibilities of incidents of anxious or stressed dogs experiencing inappropriate interactions in classrooms. Hugging and crowding dogs, for instance, together with a lack of 'escape' routes are seen as problematic in classrooms in terms of the welfare of the dog (Bidoli *et al.*, 2022), especially when they are interacting with younger children. There are also school safety implications if dogs are allowed to roam free, or off lead/leash, yet this may be beneficial for enabling more relaxed, playful interactions (e.g., VanFleet and Faa-Thompson, 2017). There are also well-being issues for the dog to consider, for example when thinking about their ability to display natural behaviors if they are expected to be confined to a bed or crate for periods of time during

the school day (Hergovich *et al.*, 2002; Anderson, 2007). Balancing the needs of children and dogs may be challenging.

Furthermore, the experiences that the animals themselves have are very important to consider (e.g. Wijnen and Martens, 2022). Teachers' planning needs to go beyond meeting basic welfare needs like providing fresh water or freedom from pain. Instead, thinking about how an interaction can offer animal-friendly interventions is important. Put simply, rather than planning interventions that ensure the absence of stress in an animal, teachers should consider how to plan sessions that bring joy to the dog. Wijnen and Martens (2022) suggest that joy is visible in a dog's eagerness to repeat a behavior, and so relates to their motivation to engage.

As Provoost suggests (Provoost in Peralta and Fine, 2021), animals involved in interventions need to have both their physical and emotional well-being considered. Although there may be ongoing debate as to the nature of animal sentience, it is important to optimize positive feelings over negative ones for all animal participants in AAEs (e.g., Peralta in Peralta and Fine, 2021). Mellor (2016) proposes that we should consider whether animals have 'a life worth living.' This perspective encompasses factors such as nutrition, physical health, stress and positive behavioral experiences, which contribute to the emotional state an animal experiences at any given time. While stress is a natural reaction that may enable an individual to cope in a particular situation, we must learn to recognize signs of distress in our animal partners. In this way, in any AAE we can strive to ensure that the animal partners have the best possible life.

To facilitate this, the animal should have choices where possible. For example, a school dog should have the option to withdraw from an activity. This may involve an additional resource implication, as ideally the dog would be able to withdraw from the classroom environment into a 'safe haven' (Bremshorst and Mills in Peralta and Fine, 2021, p. 205). The handler needs to be aware of the conditions that may cause the dog fear or anxiety, for example, if a dog is anxious when traveling in a car, visiting schools within walking distance would be better than those a car-ride away. They need to be able to identify subtle signs of stress in their dog, such as pacing, panting or paw-lifting. Positive methods of training should be adopted to help the dog learn new and desirable context-specific behaviors. In this way AAEs may be more joyful experiences for all.

There are also challenges in AAE for the human participants. For example, Rawlings in Peralta and Fine (2021) highlights the potential distress a child with additional learning needs may feel if they form a bond with a dog and then are separated from her between sessions. Similarly, the additional responsibility of having to consider a dog may prove stressful for educators already coping with a busy professional role. Grové *et al.* (2021) suggest that teacher workload, lack of guidance and support and a lack of clear understanding of what role a dog may play are key barriers to effective implementation of a school dog program.

Methods

This study was conducted using two key research tools, an online questionnaire and follow-up interviews.

The survey was designed as an online branching questionnaire, using the digital package 'Qualtrics.' This allowed for the tailoring of questions to each respondent, so that individuals with different characteristics, experiences, knowledge or opinions are routed to particular questions (Lavrakas, 2008). The survey comprised 100 items in total using a combination of closed and open-ended questions. It was arranged in four sections. The first was designed to obtain contextual and demographic information. Questions, for example, were asked about the backgrounds of the respondents, their roles, type of educational setting, the age range they taught,

whether they had any school pets, and if so, where they were based and their characteristics (e.g., gender, age, breed). The second section focused on whether respondents had a school dog, and if not whether they would consider one in the future. Depending on responses, the questionnaire then branched into exploring reasons for their responses in more detail. The third section focused on those respondents who had dogs in their school, exploring for example whether they were trained, and if the educators themselves received any training. The survey asked questions around preparation, such as notifying parents and governors and completing risk assessments as well as practices when the dog was in school. The final section asked for views on potential gains associated with having a school dog, and whether any adverse experiences had taken place. This article focuses primarily on the responses to questions in third and fourth sections.

The questionnaire was distributed via social media. The sampling approach taken was a direct open invitation by posting a message on Twitter and on prominent Facebook education groups such as 'Keeping Early Years Unique' and 'Dogs@School.' The snowballing technique was employed to encourage participants to share the link. The link was also distributed via the host institutions network of around 30 partnership schools and advertised on the website of the Chartered College of Teaching (a UK-based leading professional body for teachers). There was no attempt to target a particular audience or profile of users (e.g., by age, gender or location). This convenience sampling method was not designed to capture a representative sample; rather, data was sought to illuminate general patterns and trends characterizing the experience of the target participant group. The study design was approved by the university ethics committee and followed the latest ethical guidance provided by the British Educational Research Association (BERA, 2018).

Participants were made aware that responses were anonymous, and that their consent could be withdrawn at any time during the completion of the questionnaire. Upon submission the data could no longer be withdrawn as responses were anonymous, and participants were made aware of this. The questionnaire was open for completion between December 2021 and March 2022. Data was analyzed using SPSS. A descriptive analysis was performed, calculating frequencies for categorical variables. Bivariate analysis was also used to investigate relationships between key variables of interest. Chi-square (X^2) tests were used to establish whether there was a significant relationship between the situation of the school dog, and whether a major, minor or no incident occurred.

At the end of the survey respondents were invited to leave their contact details if they were interested in further discussion about the project, or if they wished to be interviewed about their experiences. In total 95 practitioners worldwide left their contact details. Due to convenience of time zones plus the high percentage of respondents working in the United Kingdom, 41 contacts were then contacted from the UK-based respondents. From these 9 individuals were available for the interview phase of the project between April and June 2022. Interviews took place online and lasted 45–50 min. Because of challenges with school timetables, four one-to-one interviews took place between the researcher and an individual respondent. An additional group interview with the remaining 5 respondents took place. In all interviews, a semi-structured approach was adopted to allow for topics to naturally develop and be discussed between the participants. All interviews were audio recorded using the online meeting platform's transcription facilities and the subsequent text was transferred into NVIVO for thematic analysis.

Results

The overall survey results were received from educational professionals, schools and charities across the world. For this survey, 844 respondents took part in countries ranging from the United Kingdom, the United States, Europe, Canada, Australia,

Thailand, New Zealand and the United Arab Emirates. Once the data was cleaned, there were 687 complete responses. Of these, 453 (54%) responded 'yes' to the question 'Do your learners have opportunities to work with dogs?' The majority of these respondents (79%) were from the United Kingdom (England 41%, Wales 32.3%, Scotland 5.1%, Northern Ireland 0.58%) and 17% were from the United States of America.

Table 1 shows the demographics of the schools and participants who reported that their learners had opportunities to work with dogs.

For those 188 schools without a dog, 41% reported that this was because it is not an educational priority in their school. 16.5% reported the main reason was not knowing how to find a suitable dog, while 15% had concerns over safety for

Table 1. Demographics of those who said that their learners had opportunities to work with dogs.

Question	Category	n	%
Where do you work?	Private pre-school setting (0–3)	1	0.2
	Nursery school (3–5)	1	0.2
	Primary school (3/4–11)	250	55.2
	Secondary school (11–16/18)	90	19.9
	All-age school (3–16)	13	2.9
	Special school (3–18)	47	10.4
	Independent primary	10	2.2
	Independent secondary	9	2
	Further education (16+)	4	0.9
	Higher education (18+)	3	0.7
Approximately how many pupils/students do you currently have on roll?	Other	25	5.5
	1–50	79	17.9
	51–100	38	8.6
	101–150	35	7.9
	151–200	35	7.9
	201–250	54	12.2
	251–500	99	22.4
	501–1000	57	12.9
	1001–2000	33	7.5
	2001+	12	2.7
Where is your setting based?	A rural community	101	22.3
	A town	47	47.1
	A city	27.4	27.4
	Other	3.1	3.1
What best describes your role in your setting?	Teaching assistant	33	7.3
	Classroom teacher	97	21.5
	Middle manager/leader (e.g. head of department)	32	7.1
	Senior manager/leader (e.g., assistant principal, principal)	98	21.7
	Other	192	42.5

children. Only 12% of those respondents without a dog would not consider having one in the future.

What sort of dogs are 'school dogs'?

We asked for information about the dogs themselves, to explore whether there were common characteristics amongst the school dog population. Results indicate great variety in the dogs that were being brought into schools.

Dogs included both pedigree and mixed breeds – with a quarter of dogs in this survey falling into the category of 'poodle-crosses' such as cockerpoo, cavapoo, labradoodle and goldendoodle (27.4%). In terms of pedigree breeds, 61.3% were from the Gundog¹ group, including breeds such as Golden Retrievers, Labrador Retrievers and Cocker Spaniels as well as examples of some less well-known gundogs such as Italian Spinones and Sussex Spaniels.

At the time of survey completion, the age of dogs that respondents were working with varied. Some were puppies of 8 weeks to 6 months old, although this age group had the fewest numbers (2.13%). Puppies and adolescent dogs of 7–12 months (10.13%) and 13–23 months (13.87%) made up about a quarter of the dogs working alongside respondents in this survey. A small percentage were seniors of over 11+ years (5.60%), while the largest group were dogs aged between 2 and 5 years (42%) and 6 and 10 years (22%).

Results indicated a mix of views regarding how to select the right dog. Some respondents used breed as a key aspect when selecting a dog eg 'Select a calm breed,' 'Labs can be very bouncy,' 'My advice is to get a hypoallergenic dog.' Others focused on individuality and temperament eg 'Choose the right temperament,' 'Make sure you chose a dog who enjoys the work.'

In this study, most dogs were owned by a member of the school staff (74.7%), with one quarter visiting the school as part of an externally run scheme, charity or organization (25.3%). Regardless of ownership, 60.1% of the dogs were registered as a therapy/assistance dog with an external charity or organization that took responsibility for temperament assessments. 32.7% said their dogs were not registered with an organization, and a minority of respondents were unsure if the dogs were registered with any organization (7.18%).

what sorts of activities do school dogs undertake, and with whom?

School dogs were present across the different age phases of the education sector, particularly the primary (3–11-year-olds) phase. Responses indicate that dogs are in schools with learners of a range of ages. For example, 11.9% of school dogs worked with children aged 3–5 years, 26% with 5–7 years and with students aged 8–11 years the figure was 30.6%. Dogs also worked with older students aged between 12 and 16 years (16.7%), young adults aged 16–18 years (10.4%) and adults (4.6%).

How often dogs were in school varied considerably. In nearly a third of cases dogs were in daily (30.7%). Nearly half of the dogs were in school every week (48.8%), with a smaller percentage visiting less frequently (fortnightly, 4.7%; each semester (term), 2.4; or only brought in as required for a specific topic/purpose, 13.0%). When in school, over half of the dogs remained for the entire day, with 50% being in school for 5–8 h, 16.4% being present for 3–4 h and approximately one quarter visiting for 1–2 h (27.2%). A very small number permanently lived on site, typically if the school was a residential one (5.7%).

When in school, 40.6% of dogs had a 'safe place' to retreat to such as a mat, bed or crate when requiring 'rest time.' 36.6% of the dogs in the study were able to make autonomous choices to choose

¹ According to the UK Kennel Club classifications.

not to take part in activity at any time. 3% had an 'escape route' or passageway always kept free so that they could make a choice to freely move away from unwanted situations while participating in an activity itself. A total of 14.9% always had both a safe space and an escape route offered.

In the responses to this survey, 37% of respondents rated the most important reason for having a school dog as being to improve pupil well-being. The dog's main role in class was to 'provide physical comfort' for students (18.0%). Other roles were listening to students read (14.6%), supporting behavior (14.2%), listening to pupils talking about their emotional problems (13.8%), as a reward (12.3%), encouraging attendance (7.4%), encouraging physical activity (6.8%), teaching specific areas of the curriculum for example, welfare or citizenship (6.7%), 'other,' such as specific interventions for emotional resilience (3.6) and for encouraging home school links (2.3%).

School dogs worked in a variety of organizational ways. For example, over a third worked with individuals (35.6%) while a quarter worked with small groups of up to 6 students (26.2%). Some dogs worked with pairs of children (19.4%), some with the whole class (11.5%) and some with large groups of 7–12 students (4.7%). Three quarters of dogs worked with students with additional educational learning needs. These groups of need included children with social and mental health issues (34.4%), communication and interaction needs (16.7%), cognition and learning needs (11.9%), sensory and/or physical needs (10.0%) and 'other' needs including bereaved children (3%).

TEACHER CONFIDENCE WITH DOG BODY LANGUAGE

Respondents were asked to rank on a scale of 0 (not confident) to 10 (confident) how confident they felt recognizing how their dogs were feeling.

Table 2 shows the mean and standard deviation for each statement from highest to lowest average. Overall, participants showed high levels of confidence for each of the statements, with the lowest average levels of confidence and larger variation in responses in those who said that they 'recognize appeasement signals' (M = 8.43, s.d. 2.23).

MAJOR AND MINOR INCIDENTS

Respondents were asked whether they had experienced any incidents when the dog was in school. These ranged from those we classed as 'major' for example, growling, snapping or biting, to those we classed as minor (e.g., toileting). Table 3 shows the number of major and minor incidents that the participants reported that they had encountered. Most participants (65.6%) reported no incidents. 4.4% reported only a major incident, 18.5% reported only a minor incident and 11.5% reported both a major and a minor incident.

For the purposes of this analysis, those who had both major and minor incidents (11.5%) have been grouped with 'major incidents'. Therefore, Table 4 illustrates relationships between no incidents (65.6%), minor incidents (18.5%) and major incidents (15.9%).

The following relationships were found:

- Groups of children: There was significantly more likely to be a minor incident if the participant reported that the dog worked with learners with special educational needs, children with behavioral needs, looked after children and children classed as vulnerable. Furthermore, there was more likely to be a major incident if the dog worked with learners who have suffered bereavement, or who were described as low on confidence. There was more likely to be both major and minor incidents reported if the dog worked with 'all children.'

Table 2. Mean confidence in recognizing body language.

<i>"How confident are you of reading canine body language and communication"</i>	Mean*	s.d.
I recognize when a dog is interested	9.16	1.5
I recognize when a dog is angry	9.09	1.7
I recognize when a dog is tired	9.04	1.6
I recognize when a dog wishes to withdraw from an activity	9.02	1.5
I recognize when a dog is happy	9.01	1.5
I recognize when a dog is anxious	8.98	1.6
I recognize when a dog is giving consent to participate	8.86	1.8
I recognize appeasement signals	8.43	2.2

*10 = fully confident; 0 = not at all confident.

Table 3. Major and minor incidents.

		n	%
Major incident	The dog has growled/ barked at a child	37	8.2
	The dog has growled/ barked at an adult	50	11
	The dog has scratched someone	13	2.9
	The dog has snapped at someone	7	1.5
	The dog has damaged school/ child property	5	1.1
	The dog has bitten someone	3	0.7
	Total	115	15.9
Minor incident	The dog has refused to participate in an activity	53	11.7
	The dog has toileted inside the school	52	11.5
	The dog has vomited inside the school	31	6.8
	The dog has been overly enthusiastic	67	14.8
	Total	203	30

- Age of learner: There was no significant impact of the age of the learner and whether an incident was reported.
- Training: Dogs that had only had basic puppy class training were significantly more likely to have a major incident. Dogs who had a higher level of training were significantly more likely to have a minor incident, but significantly less likely to have a major incident.
- Length of time in setting: Dogs that are typically in school 1–2 h were significantly less likely to have a major or minor incident, while dogs that are typically in school 5–7 h were significantly more likely to have a major incident.
- Owner: There was significantly more likelihood of both a major and minor incident occurring if the dog was owned by a member of staff compared to an external handler.

INTERVIEWS

The interviewees represented a range of schools across England and Wales, and Table 5 outlines their contexts:

The interviews highlighted that each school had taken an individual approach to the selection, preparation and implementation of their dogs. Regardless of the approach taken, however, all interviewees

Table 4. Relationships with major and minor incidents.*

	No incident		Minor incident		Major incident		χ ²	p
	n	%	n	%	n	%		
What age learners does the dog work with?								
Under fives	76	60.3	25	19.8	25	19.8	2.6	0.27
5–7	182	65.9	54	19.6	40	14.5	1.3	0.53
8–11	209	64.5	63	19.4	52	16	0.7	0.70
12–15	105	59.7	39	22.2	32	18.2	4.5	0.11
16–18	65	59.1	25	22.7	20	18.2	2.8	0.25
Adults	29	59.2	11	22.4	9	18.4	1.0	6.05
Does the dog work with any specific groups of children?								
Pupils with ALN/SEN	132	55.9	61	25.8	43	18.2	22.8	<0.001
Pupils who have suffered bereavement	71	54.2	30	22.9	30	22.9	11.2	0.004
Low achieving pupils	88	60.3	31	21.2	27	18.5	27	0.26
Pupils low on confidence	138	59.2	50	21.5	45	19.3	8.7	0.01
Shy pupils	101	59.1	36	21.1	34	19.9	5.5	0.07
Learners with poor reading skills	106	65.4	35	21.6	21	13	2.6	0.27
Learners with poor oracy skills	55	67.1	14	17.1	13	15.9	0.2	0.93
Children with behavioral needs	173	56.8	49	24.6	37	18.6	12.9	0.002
Looked after children	44	52.4	24	28.6	16	19.0	9.0	0.01
Children classed as vulnerable	83	55.3	39	26.0	28	18.7	11.4	0.003
All children	100	53.8	45	24.2	41	22.0	19.6	<0.001
No training	38	65.5	6	10.3	14	24.1	16.2	0.003
Basic puppy classes	31	48.4	12	18.8	21	32.8		
Higher level training (kennel club or equivalent)	115	55.3	60	28.8	33	15.9		
When the dog is in your setting, how long are they typically in for?								
1–2 h	82	82.0	12	12.0	6	6.0	39.8	<0.001
3–4 h	34	57.6	17	28.8	8	13.6		
5–7 h	85	45.7	48	25.8	53	28.5		
Does your dog work off lead when in school?								
Yes	82	43.4	56	29.6	51	27.0	24.8	<0.001
No	113	69.8	28	17.3	21	13.0		
Who does the dog belong to?								
Member of staff	139	37.1	74	26.4	67	23.9	37.4	<0.001
External handler	81	85.3	9	9.5	5	5.3		

*Those in **bold** had a z score of +1.96 meaning that this category was significantly more likely than expected to select this response; those in *italics* has a z score of -1.96 meaning that this category was significantly less likely than expected to select this response.

Table 5. Details of the interviewees.

Country	School type	Staff role	Dog/s	Dog's age
England	Primary (5–11)	Head teacher	Labrador female	3 years
England	Primary (5–11)	Head teacher	Labradoodle female	10 months
England	Primary (5–11)	Head teacher	Labrador female	3 years
Wales	Independent prep school (3–11)	Well-being teacher	Labrador male (+ 2 others)	9 years
Wales	Special school (5–18)	Class teacher	Dachshund female (+ 2 others)	3 years
Wales	Primary (3–11)	Deputy head	King Charles spaniel Female (+ 1 other)	8 years
England	SEMH (social, emotional and mental health) unit secondary (11–18)	SEMH support teacher	Labrador female (+ 2 others)	5 years
Wales	Primary (3–11)	Head teacher	Cavapoo male	2 years
England	SEMH Secondary (11–18)	Associate principal	Cavapoo male	18 months

felt that having a school dog had a positive impact on learners. For example, one teacher commented,

'You know I'm very much, 'You're with the dog now' I don't make any judgements – I don't give any advice with the reading – it's you've got the dog now, it's your relationship with that dog. And that's the impact it's had, that children are no longer worried about you correcting them or that they can't read.'

Another teacher commented on the effects of different dogs on the whole school community, including the staff,

There's different dogs for different children's needs. [Bruno] is a bit more high energy so he'll do things. He likes to do 'Hoopers,' he likes to 'play hide and seek' and the kids love that. They can hide something. So, he's got a catnip banana, we've done some work with him. They'll hide that and he can find it, even in a whole field – and kids just think that stuff like that is magic! And it's just his like kind of boundless energy and enthusiasm and his ability to make the staff smile – you can't be miserable with [Bruno] around!

All interviewees felt that there were specific benefits for certain pupils. For example, one teacher commented that 'We've got a boy in Reception Class, who was a sort of bordering selective mute, but he will speak about [Rex] and put sentences together.'

This was true for learners with diverse needs, with all the interviewees perceiving the impact of the dog to be beneficial for many children. Several teachers particularly commented on the effects of the dog for those pupils with social emotional and mental health needs,

'It's something quite special. Isn't it something, even the way that if a child has a bad weekend or there's something going on, they just come and sit in the office on the floor with the dog and they just pour out everything – but you can see that weight lifted from them, sometimes, when they're sat there with that dog.'

However, interviewees also acknowledged the challenges of managing a dog alongside fulfilling the role of a teacher. Some of these referred to practical and operational challenges, such as managing the physical needs of the dog, such as toileting, or behaviors such as barking and over exuberance. Others referred to the challenges of managing interactions safely and appropriately. For example, one respondent related to the difficulties of managing the relationships between children and dogs, particularly when some children are anxious around dogs. They recounted the time the school dog became loose in the playground.

'He slipped the lead and one student who is quite fearful for the dogs ran away because he was scared. What the dog thinks is 'great you are running,' and because the child is screaming the dog was jumping up in excitement. We had to hold the child and get the dog. And he did scratch his arm, not out of malice, just because he's jumping up, because there's a kid running and screaming.' (Headteacher, Primary School).

Several recognized that at times the interviewees felt that not all dogs were enjoying their school roles. For example, in the quotation below the class teacher noted challenges when they needed to leave the dog in their office, or when they tried to carry out activities where the dog was asked to work with individual children.

'If I leave the room to go to the copier and I forget to take it with me he just cries. If I go in the staff room just to make cup of tea, I can hear him through the wall as he's crying in the office. Occasionally, this can depend on what mood he's in, if we go to the yard area and the children take him up on the field, he sometimes wrestles out of his harness to run back to me. But that's only if the children stop so if they walk with him so he's being entertained he walks around with them, but then as soon as they've done a circle and he sees me he pulls them to get back to me as if, like we've been separate for months and it's been two minutes.'

Other responses noted the challenges of working with sentient animals who do not always choose to adhere to the lesson planning! For example, one stated that 'It's a very romantic idea but the dog can be very needy and won't always participate'.

Discussion

In this article, we highlight some of the generally under-reported challenges of running AAEs with the aim of raising awareness amongst teachers. In this way they may be better prepared and better able to offer suitable provision that will bring joy to all participants. Our data suggests that dogs are present in a wide variety of schools, from pre-school settings with very young children to higher education contexts with learners who are adults. In our survey they were particularly prevalent in schools for children of primary age (3–11 years). School dogs can be found in rural and urban schools, and in the smallest ones, with less than 50 learners, to the largest where there may be more than 2000 students. Dogs of all ages are present in school environments. While research suggests that as a species dogs are highly adaptable, and so many may be able to tolerate such expectations (Wynne, 2021), this study illustrates that in some contexts, unexpected and undesirable events take place.

This research set out to explore three key questions.

What sorts of activities do school dogs undertake, and with whom?

This study suggests that many school dogs are expected to work flexibly and are often in school for the whole working day. The types of activities that they are involved in means that school dogs, including young puppies, are often expected to be able to cope with:

- Working in a variety of locations around the school.
- Interacting with children of all ages, and with varying needs.
- Engaging in a range of structured and unstructured activities.
- Working with individuals, small groups and whole classes.
- Lengthy periods of time in a school environment.
- Lack of choice of when to participate in activities.

The results raise questions about the expectations that we have of dogs in school environments. There is research that explores the challenges of identifying 'general' qualities a dog involved in AAls should have (e.g. Bremhorst and Mills in Peralta and Fine, 2021). General characteristics such as robust temperament, adaptability, responsiveness, secure attachment to handler, self-motivation for the job and tendency to display subtle signs of stress are desirable in any school dog (e.g., Bremhorst and Mills in Peralta and Fine, 2021). This study highlights that for many dogs in schools their role is complex and involves multiple situations, and in this research a single model of what a 'school dog' is like does not exist. For many their roles are very varied. Some dogs in schools are expected to behave calmly and predictably in a range of contexts that may need them to ignore some of their instincts. They are expected to become immersed in an unpredictable environment and interact with unfamiliar people on a regular basis. This has implications for selection and preparation of a suitable school dog (Binfet and Kjellstrand Hartwig, 2020, p. 56).

A quarter of school dogs in the survey responses were under 2 years of age, and a small proportion are in school before they are 6 months old. The reason given for this by many teachers was a belief in the importance of early socialization. When asked how a dog was selected to be a school dog, in some cases, teachers are relying on puppies' provenance or breed traits, rather than actual personality and individualism, and where some dogs are 'temperament' tested, others are introduced too young to truly indicate whether they are robust enough for the specific school environment (e.g., Duffy and Serpall, 2012; Vaterlaws-Whiteside and Hartmann, 2017). A recommendation would therefore be to provide guidance for teachers about the nature of socialization. Better understanding the potential risks of early exposure to stressful situations (e.g., Fatjó *et al.* in Peralta and Fine, 2021), such as a busy school environment, and appropriate approaches to socialization would help teachers make better informed decisions.

Our study also found that most school dogs were in school for the whole working day. However, how long the dog is in school for is only part of the story; what we recommend teachers consider is the intensity of the day for the dog. We found great variety in approach. While some school dogs were taken to specific classes for short, 15-min interactions throughout the day, others were in classrooms almost continually. While some were able to remove themselves from a specific location at will, others had timetabled toilet and rest breaks that fitted into the school day. Some dogs were expected to participate in high contact (McCulloch *et al.* in Peralta and Fine, 2021, p. 145) activities such as being groomed, or learning tricks, while others spent longer in lower contact activity such as walking. Higher contact may be more stressful for the dog over periods of time. We would recommend that teachers consider not only the length but also intensity of activities planned for any individual dog and adjust these accordingly so that the individual dog's welfare can be monitored carefully.

Do teachers report any unexpected incidents between the dog and people in the school?

The study revealed several responses that commented on how initiatives involving school dogs included an additional responsibility for teachers including constant vigilance and awareness of what the dog was doing, and the demands involved in monitoring interactions. There were reported issues with changes to routines, planning, deadlines and meetings, dealing with differing views from staff members, arranging children in order that they were able to have access to the dog and unexpected reactions from individual children.

There was also evidence in both the survey and interview data that identified times where children, staff or dogs became distressed or anxious. This was seen as surprising by many, yet despite these incidents, the majority of teachers still felt that the dog was of benefit to the classroom. However, the impact on the dogs themselves is an area needing further research,

If so, what is the nature of these incidents, and what recommendations should be made to minimize these?

One finding was that minor and major incidents were more likely to take place with certain groups of learners. It is possible that this may reflect how attuned dogs are to humans (Payne *et al.*, 2015) They have a predisposition to interpret from human faces information relating to emotion and intention, seeking reassurance and guidance (Horowitz, 2009). While this can result in positive interactions, it is possible that this can also cause more stressful responses. If a dog is working alongside a child who for example, is prone to frequent outbursts of temper, this may cause the dog's handler some stress. The dog may respond to these emotions and inadvertently exacerbate the situation, towards either the child or the dog's handler (Huber and Lonardo, 2023).

Furthermore, nearly one fifth of survey responses suggested that the dog was expected to be a source of physical comfort. Aligned with the fact that teachers were least confident in recognizing their dog's appeasement signals, or being aware of when the dog was giving consent to participate, this might be a risky activity. A recent scoping review from research into children's dog bite data (Giraudet *et al.* 2022) acknowledges that dog bite incidents are usually attributed to misreading or ignorance of the early indicators that the dog is in discomfort. Bites to the face or neck are often due to children's size or proximity to the dog, with children younger than 5 years most at risk. Although schools write policies and undertake risk assessments, being confident reading dog body language 'in the moment' and being able to proactively intervene or prevent incidents is an essential recommendation for all involved in such programs. Indeed, Jakeman *et al.* (2020) see an important role for education in reducing the incidence of pediatric dog bites. They suggest that both children and parents must be taught that any dog can bite, regardless of breed. The authors also state that all child-dog interactions must be highly supervised, yet this can be challenging in the classroom with competing pressures on time and attention for teachers.

Our data revealed that bringing a dog into school can involve moments of distress or anxiety for children and dogs. For example, dogs are reported to be distressed when left in offices alone, or if they are unable to see who is coming to a door. Our data suggests that some dogs may demonstrate stressed behaviors such as barking, whining or pacing if they cannot reach a certain person but can see them through a window. Some may have difficulties interacting with different members of staff or children (for example, in some cases people in fluorescent jackets or wearing hats) or even take a dislike to the sound and motion of the photocopier. In schools where there is more than one dog in school there may be challenges managing multi-dog relationships. This highlights

the importance of assessing suitability in context, rather than in an external training environment such as a dog training class. Schools are unique and so it is important to ensure that individual dogs are happy and relaxed in these contexts.

To further minimize such scenarios, Serpell *et al.* (2010, in Fine, 2010, p. 49) suggest that the handler should know the dog well enough to anticipate issues before they arise, rather than reacting once signals of stress or anxiety are seen. To do this, the handler must be proactive, not reactive, and know their individual dog well, and remain cognizant of their behavior throughout the session. This may be challenging as this study found that many handlers are also the class teacher, particularly when the dog is a permanent school dog. We recommend that all human participants in AAEs learn how to recognize and indeed anticipate stress and anxiety in the individual dogs in their school contexts. The handler needs to recognize their role in protecting the well-being of all involved and should have access to training that helps them understand and manage the role of teacher and handler effectively.

We also recommend that AAE interventions are gradually established over time. Relationships between children and dogs take time to develop (e.g., Lewis, Oostendorp Godfrey and DeLeon, 2023), and research suggests that when a dog has formed a bond with an individual, they are more willing to interact socially and explore their environment (Mills *et al.* in Peralta and Fine, 2021, p. 105).

Any AAE should also be robustly designed, with a clear rationale that considers the needs of individual children, but also the needs of the animal involved. Any intervention needs careful planning, monitoring and evaluation. For instance, taking a 'Theory of Change' (ToC) approach would involve teachers mapping clear causal pathways to identify all the underlying issues related to the prevailing problem, and then considering changes and conditions required to reach the end-goal (Baatz *et al.*, 2020). In the case of a reading to dogs intervention for example, teachers may identify a group of children needing support because their reading levels are below expectations. Achieving the long-term goal of improved competence in reading may have a number of short-term changes in behavior associated with it eg increasing enthusiasm for reading. To implement the change appropriately consideration must be given to the children but also to the dogs. This might mean for example considering the length of time a reading session will last, and teaching participants and teachers how to recognize signs of stress in the dog.

There were limitations to this study, for example the nature of some survey questions means that conclusions must be tentative. For example, the survey asked for the age of the school dog; however, this did not provide us with information about the age the dog was when they first started working in school. As such it is possible that we have underestimated how many puppies and young dogs are in school environments. The survey asked about incidents that teachers had experienced while the dog was present. This item involved a certain element of subjective reporting – whether for example a dog's behavior was perceived to be over-enthusiastic or not would depend on the individual. The interviews were carried out with a small population of self-selecting individuals all of whom were positive and enthusiastic about the role of dogs in schools and had undertaken the role of handler themselves. As such their perceptions and memories may have been overly positive.

Nonetheless this research is important. Given the rapid growth in popularity of AAEs, and of school dogs, there is a need for more research into what works well. There needs to be clear guidance to ensure risk is minimized, and the needs of dogs as well as pupils are met. We recommend teachers have access to better training on canine communication and stress signals and have guidance

on effective planning and design of ethical AAEs. They need the opportunity to consider and mitigate against the potential challenges of implementing such approaches, as well as understanding the potential benefits. Teachers need to understand why the dog should be able to make some choices during interactions, why the dog needs to have time to form relationships and how to manage the requirement for the dog to be able to remove themselves from the interaction.

We would recommend a simple protocol comprising 10 steps be taken by any teacher wishing to bring a dog into their classroom:

Plan:

1. Clearly define the objectives of introducing a dog, such as reducing stress and anxiety, and use high-quality research to inform the rationale.
2. Select a dog whose personality and individual characteristics make them a good fit for the intervention, and ensure they are healthy, trained to an appropriate level and assessed in a school context.
3. Select participants whose needs and interests align with working alongside a dog.

Prepare:

4. Undertake detailed risk assessments and ensure stakeholders are fully informed.
5. Teach pupils, parents and staff about safety around dogs, with a key focus on careful observation and interpretation of canine communication.
6. Designate a safe, clean and comfortable area within the school for the dog and ensure that they can rest there without feeling stressed.

Implement and Evaluate:

7. Monitor the dog's well-being and stress levels during visits and make adjustments to the program as needed based on feedback and observations.
8. Regularly assess the impact of the program on students' well-being and the school environment and adjust as needed based on feedback and observations.

Expect the unexpected:

9. Identify and accommodate students and staff with allergies or phobias by establishing designated dog-free areas.
10. Develop a plan for dealing with potential emergencies or adverse reactions, such as allergic reactions or dog-related incidents.

In summary, bringing a dog into school can be a wonderful experience. However, to minimize the likelihood of unexpected, negative events happening, teachers need to take an ethical stand in their AAE provision, so that both children and dogs feel comfortable and experience joy through their interactions with one another.

CONFLICT OF INTEREST

The authors are unaware of any conflicts of interest in this research.

ETHICS STATEMENT

Ethics statement confirming that all relevant guidelines were followed.

This research gained ethical approval from the author's home institution.

AUTHOR CONTRIBUTIONS

All author contributed equally to the development of this article.

FUNDING STATEMENT

This research was funded by a British Academy/Leverhulme Trust Small Research Grant.

References

- Anderson, K.L. (2007) Who let the dog in? How to incorporate a dog into a self-contained classroom. *Teaching Exceptional Children Plus* 4, 2–17.
- Baatz, A., Anderson, K.L., Casey, R., Kyle, M., McMillan, K.M., Upjohn, M. and Sevenoaks, H. (2020) Education as a tool for improving canine welfare: Evaluating the effect of an education workshop on attitudes to responsible dog ownership and canine welfare in a sample of key stage 2 children in the United Kingdom. *PLoS One* 15. DOI: 10.1371/journal.pone.0230832.
- Beetz, A. (2013) Socio-emotional correlates of a schooldog-teacher-team in the classroom. *Frontiers in Psychology* 4, 886. DOI: 10.3389/fpsyg.2013.00886.
- Beetz, A., Julius, H., Turner, D. and Kortschal, K. (2012) Effects of social support by a dog on stress modulation in male children with insecure attachment. *Frontiers in Psychology* 3, 352. DOI: 10.3389/fpsyg.2012.00352.
- Bidoli, E.M.Y., Firknes, A., Bartels, A., Erhard, M.H. and Doring, D. (2022) Dogs working in schools – Safety awareness and animal welfare. *Journal of Veterinary Behavior* 2022, 35–48. DOI: 10.1016/j.jveb.2022.09.004.
- Binfet, J.-T. and Kjellstrand Hartwig, E. (2020) *Canine Assisted Interventions – A Comprehensive Guide to Credentialing Therapy Dog Teams*. Routledge, New York.
- Brelsford, V., Dimolareva, M., Gee, N. and Meints, K. (2020) Best practice standards in animal-assisted interventions: How the LEAD risk assessment tool can help. *Animals* 10, 974–985. DOI: 10.3390/ani10060974.
- Brelsford, V.L., Dimolareva, M., Rowan, E., Gee, N.R. and Meints, K. (2022) Can dog-assisted and relaxation interventions boost spatial ability in children with and without special educational needs? A longitudinal, randomized controlled trial. *Frontiers in Pediatrics* 10, 886324. DOI: 10.3389/fped.2022.886324.
- Bremshorst, A. and Mills, D. (2021) Working with companion animals and especially dogs in therapeutic and other AAI settings. In: Peralta, J.M. and Fine, A.H. (eds) *The Welfare of Animals in Animal Assisted Interventions*. Springer Veterinary Medicine, Heidelberg, Germany, pp. 191–218.
- British Educational Research Association (BERA) (2018) *Ethical Guidelines for Educational Research*, 4th edn. Available at: <https://www.bera.ac.uk/publication/ethical-guidelines-for-educational-research-2018> (accessed 5 July 2023).
- Carlisle, G. (2015) The social skills and attachment to dogs of children with autism spectrum disorder. *Journal of Autism & Developmental Disorders* 45, 1137–1145. DOI: 10.1007/s10803-014-2267-7.
- Duffy, D.L. and Serpall J.A. (2012) Predictive validity of a method for evaluating temperament in young guide and service dogs. *Applied Animal Behaviour Science* 138, 99–109. DOI: 10.1016/j.applanim.2012.02.0116.
- Fatjó, J., Bowen, J. and Calvo, P. (2021) *The Welfare of Animals in Animal Assisted Interventions*. In: Peralta, J.M. and Fine, A.H. (eds) Springer Veterinary Medicine, Heidelberg, Germany, pp. 91–122.
- Gee, N.R., Church, M.T. and Altobelli, C.L. (2010a) Preschoolers make fewer errors on an object categorization task in the presence of a dog. *Anthrozoös* 23, 223–230. DOI: 10.2752/175303710X12750451258896.
- Gee, N.R., Crist, E.N. and Carr, D.N. (2010b) Preschool children require fewer instructional prompts to perform a memory task in the presence of a dog. *Anthrozoös* 23, 173–184. DOI: 10.2752/175303710X12682332910051.
- Gee, N.R., Friedmann, E., Coglitore, V., Fisk, A. and Stendahl, M. (2015) Does physical contact with a dog or person affect performance of a working memory task? *Anthrozoös* 28, 483–500.
- Giraudet, C.S.E., Liu, K., McElligott, A.G. and Cobb, M. (2022) Are children and dogs best friends? A scoping review to explore the positive and negative effects of child-dog interactions. *PeerJ* 10, e4532. DOI: 10.7717/peerj.14532.
- Gleason, T. and Narvaez, D. (2014) Child environments and flourishing. In: Narvaez, D., Valentino, K., Fuentes, A., McKenna, J. and Gray, P. (eds.) *Ancestral Landscapes in Human Evolution: Culture, Childrearing and Social Wellbeing*. Oxford University Press, New York.
- Grové, C., Henderson, L., Lee, F. and Wardlaw, P. (2021) Therapy dogs in educational settings: Guidelines and recommendations for implementation. *Frontiers in Veterinary Science* 8, 655104. DOI: 10.3389/fvets.2021.655104.
- Gruen, M.E., Roe, S.C., Griffith, E.H. and Sherman, B.L. (2017) The use of trazodone to facilitate calm behavior after elective orthopedic surgery in dogs: Results and lessons learned from a clinical trial. *Journal of Veterinary Behavior: Clinical Applications and Research* 22, 41–45.
- Hediger, K., Gee, N. and Giffin, J.A. (2017) Do animals in the classroom improve learning, attention or other aspects of cognition? In: *How Animals Help Students Learn-Research and Practice for Educators and Mental-Health Professionals*. Routledge, New York, New York/Abingdon, Oxon.
- Henderson, L., Grove, C., Lee, F., Trainer, L., Schena, H. and Prentice, M. (2020). An evaluation of a dog-assisted reading program to support student well-being in primary school. *Children and Youth Services Review* 118, 105449.
- Hergovich, A., Monshi, B., Semmler, G. and Zieglmayer, V. (2002) The effects of the presence of a dog in the classroom. *Anthrozoös: A Multidisciplinary Journal of The Interactions of People & Animals* 15, 37–50.
- Hilton, C.L., Ratcliff, K., Collins, D.M., Flanagan, J. and Hong, I. (2019) Flourishing in children with autism spectrum disorders. *Autism Research* 12(6), 952–966. DOI: 10.1002/aur.2097. Epub: 2019 Mar 26.
- Horowitz, A. (2009) *Inside of a Dog: What Dogs See, Smell, and Know*. Chicago/Turabian.
- Huber, L. and Lonardo, L. (2023) Canine perspective taking. *Animal Cognition* 26, 275–298. DOI: 10.1007/s10071-022-01736-z.
- International Association of Human-Animal Interaction Organizations (IAHAIO) (2018) The IAHAIO Definitions for Animal Assisted Intervention and Guidelines for Wellness of Animals Involved in AAI. Available at: <https://iahaio.org/2018/06/20/iahaio-white-paper-on-animal-assisted-interventions-updated-for-2018/> (accessed 5 July 2023).
- Jalongo, M.R. (2015) An attachment perspective on the child-dog bond: Interdisciplinary and international research findings. *Early Childhood Education Journal* 43, 395–405. DOI: 10.1007/s10643-015-0687-4.
- Jakeman, M., Oxley, J.A., Owczarczak-Garstecka, S.C. and Westgarth, C. (2020) Pet dog bites in children: Management and prevention. *BMJ Paediatrics Open* 4, e000726. DOI: 10.1136/bmjpo-2020-000726.
- Kerns, K.A., Obeldobel, C.A., House, H., Kochendorfer, L.B., White, A. and Gastell, M. (2023) (2023) *Children's Experiences of Positive Affect with Pet Dogs: A Multi-Method Study*. CABI International, Human-Animal Interactions. DOI: 10.1079/hai.2023.0022.
- Kertes, D.A., Liu, J., Hall, N.J., Hadad, N.A., Wynne, C.D.L. and Bhatt, S.S. (2017) Effect of pet dogs on children's perceived stress and cortisol stress response. *Social Development* 26, 382–401.
- Keyes, C.L.M. (2007) Promoting and protecting mental health as flourishing—A complimentary strategy for improving national mental health. *American Psychologist* 62(2), 95–108. DOI: 10.1037/0003-066X.62.2.95.
- Lavrakas, P.J. (2008) *Encyclopedia of Survey Research Methods*. Sage Publications Inc., Thousand Oaks, CA.
- Lee, C.Y., Ngai, J.T.K., Chau, K.K.Y., Yu, R.W.M. and Wong, P.W.C. (2022) Development of a pilot human-canine ethogram for an animal-assisted education programme in primary schools – A case study. *Applied Animal Behaviour Science*, 105725. DOI: 10.1016/j.applanim.2022.105725.
- Lenihan, D., McCobb, E., Diurba, A., Linder, D. and Freeman, L. (2016) Measuring the effects of reading assistance dogs on reading ability and attitudes in elementary schoolchildren. *Journal of Research in Childhood Education* 30, 252–259.
- Lewis, H. and Grigg, R. (2021) *Tails from the Classroom: Learning and Teaching through Animal Assisted Interventions*. Crown House Publishing Limited, Carmarthen, Wales.
- Lewis, H., Grigg, R. and Knight, C. (2022) An international survey of animals in schools: Exploring what sorts of schools involve what sorts of animals and educators' rationales for these practices. *People and Animals: The International Journal of Research* 5(1), Article 15.

- Lewis, H., Oostendorp Godfrey, J. and DeLeon, M. (2023) Tails of the unexpected: What really happens when dogs visit schools? In: *The Second Annual International Animal Assisted Play Therapy® Online Conference 2022*.
- Mayer, W.V. (1980) Objectives of animal use in biology classes. In: McGiffin, H. and Brownley, N. (eds) *Animals in Education: Use of Animals in High School Biology Classes and Science Fairs*. Available at: <https://www.wellbeingintlstudiesrepository.org/cgi/viewcontent.cgi?article=1000&context=hebg>.
- McCulloch, W. (2021) *The Welfare of Animals in Animal Assisted Interventions*. In: Peralta, J.M. and Fine, A.H. (eds) Springer Veterinary Medicine, Heidelberg, Germany, p. 266.
- Meehan, M., Massavelli, B. and Pachana, N. (2017) Using attachment theory and social support theory to examine and measure pets as sources of social support and attachment figures. *Anthrozoös* 30, 273–289.
- Meints, K. and De Keuster, T. (2009) Don't kiss a sleeping dog: The first assessment of 'the blue dog' bite prevention program. *Journal of Pediatric Psychology* 34, 1084–1090.
- Meints, K., Brelsford, V.L., Dimolareva, M., Marechal, L., Pennington, K., Rowan, E. and Gee, N.R. (2022) Can dogs reduce stress levels in school children? Effects of dog-assisted interventions on salivary cortisol in children with and without special educational needs using randomized control trials. *PLoS One* 17(6). DOI: 10.1371/journal.pone.0269333.
- Mellor, D.J. (2016) Updating animal welfare thinking: Moving beyond the 'five freedoms' towards 'a life worth living'. *Animals* 6(3), 21. DOI: 10.3390/ani6030021.
- Mills, D., Dube, M. and Zulch, H. (2021) In: Peralta, J.M. and Fine, A.H. (eds) *The Welfare of Animals in Animal Assisted Interventions*. Springer Veterinary Medicine, Heidelberg, Germany, p. 105.
- Noble, O. and Holt, N. (2018) A study into the impact of the reading education assistance dogs scheme on reading engagement and motivation to read among early years foundation-stage children. *Education* 3–13(46), 277–290.
- Payne, E., Bennett, P.C. and McGreevy, P.D. (2015) Current perspectives on attachment and bonding in the dog-human dyad. *Psychology Research and Behavior Management* 8, 71–79. DOI: 10.2147/PRBM.S74972.
- Peralta, J.M. and Fine, A.H. (2021) *The Welfare of Animals in Animal Assisted Interventions*. Springer Veterinary Medicine, Heidelberg, Germany, pp. 265–284.
- Provoost, L. (2021) *The Welfare of Animals in Animal Assisted Interventions*. In: Peralta, J.M. and Fine, A.H. (eds) Springer Veterinary Medicine, Heidelberg, Germany, pp. 59–90.
- Rawlings, J.M. (2021) *The Welfare of Animals in Animal Assisted Interventions*. In: Peralta, J.M. and Fine, A.H. (eds) Springer Veterinary Medicine, Heidelberg, Germany, pp. 265–284.
- Schretzmayer, L., Kotrschal, K. and Beetz, A. (2017) Minor immediate effects of a dog on children's reading performance and physiology. *Frontiers in Veterinary Science* 4.
- Smith, B.P. and Dale, A.A. (2016) Integrating animals in the classroom: The attitudes and experiences of Australian school teachers toward animal-assisted interventions for children with autism spectrum disorder. *Pet Behaviour Science* 1, 13–22.
- Steel, J., Williams, J.M. and McGowen, S. (2021) Reading to dogs in schools: An exploratory study of teacher perspectives. *Educational Research* 1–23. DOI: 10.1080/00131881.2021.1956989.
- Stevenson, K., Jarred, S., Hinchcliffe, V. and Roberts, K. (2015) Can a dog be used as a motivator to develop social interaction and engagement with teachers for students with autism? *Support for Learning* 30, 341–363.
- VanFleet, R. and Faa-Thompson, T. (2017) *Animal Assisted Play Therapy*. Professional Resource Press, Sarasota, Florida, USA.
- Vaterlaws-Whiteside, H. and Hartmann, A. (2017) Improving puppy behaviour using a new standard socialization program. *Applied Animal Behaviour Science* 197, 55–61. DOI: 10.1016/j.applanim.2017.08.003.
- Wijnen, B. and Martens, P. (2022) Animals in animal-assisted services: Are they volunteers or professionals? *Animals* 12, 2564. DOI: 10.3390/ani12192564.
- Woehr, A. and Newman, K. (2020) Effects of dog ownership and academic success: A correlational study. *Journal of Student Research* 9.
- Wohlfarth, R., Mutschler, B., Beetz, A. and Schleider, K. (2014) An investigation into the efficacy of therapy dogs on reading performance in 6–7 year old children. *Human-Animal Interaction Bulletin* 2, 60–73.
- Wynne, C.D.L. (2021) The indispensable dog. *Frontiers in Psychology* 12. DOI: 10.3389/fpsyg.2021.656529.