

Service Animals and Pet Therapy in Schools: Synthesizing a Review of the Literature

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Abstract

As the academic and social-emotional needs of students in schools continue to increase, so too does the presence of dogs in educational spaces. This article aims to present an overview of past and present animal-assisted intervention practices in school settings. This comprehensive literature review examines the current state of research within this field of study. Data from 29 publications were selected according to strict inclusion and exclusion criteria. The results highlight three categories in which the presence of dogs in schools have an impact: social-emotional, cognitive, and physiological. Challenges to program implementation include health risks, cultural context, and negative effects on the animal. Due to the lack of school-based research, more study is needed, especially in order to understand the effect of dogs on the social-emotional learning of students. Finally, the welfare and training of the animals involved should be taken into consideration, and regulations regarding handler and animal training should be enforced.

Introduction

Over the past 26 years, North American classrooms have become increasingly diversified due to the integration of students with special needs who had formerly been excluded (UNESCO, 1994). In 2000, UNESCO recommended that schools consider every student as a unique individual with their own needs, interests, and strengths. This is now referred to as *inclusive education*, otherwise known as “education for all” (UNESCO, 2000). Educators are therefore encouraged to consider a student’s individual needs and to expand their teaching and intervention strategies according to their students’ group profile, which includes social-emotional, cognitive, and physical development (Prud’homme et al., 2011). The challenge lies in the ability of educators to adapt to these new realities while simultaneously teaching classrooms of 18–38 students in a safe and nurturing environment.

Several student profiles with specific characteristics, such as autism and learning disabilities, often require special support in the classroom. Students with disabilities also require adaptations that require significant resources that public schools do not necessarily possess. The field of education now seems to be at a crossroads, and a call for innovation has changed the conversation.

The incorporation of animals into intervention settings has gained the attention of the public education system and researchers over the past 60 years. With the increasing popularity of dogs in educational milieus, researchers have decided to study the phenomenon to better understand the impact of dogs on children (Gee et al., 2017). Some systematic reviews have focused on popular approaches. For example, Hall et al. (2016) presented data pertaining to dogs in reading programs while Davis et al. (2015) conducted a systematic review regarding research on assistance dogs for children with autism. These authors concluded that dogs had a positive effect on young people, but that more evidence was needed to explain the relationship between dogs and the student's well-being and overall development. To date, it has not been possible to identify any literature review focused on the overall effect of both assistance and therapy dogs on children.

There is a growing interest in incorporating animals into the school environment as a type of intervention method to support students who demonstrate a range of exceptionalities. This interest is not surprising because children are naturally drawn toward family pets (Uttley, 2013). Dogs are the most predominant animal in classrooms because they are highly trainable and are common members of North American households (Burrows et al., 2008; Fine, 2015; Miura et al., 1998; Spruin & Mozova, 2018).

In this article, I aim to present the existing knowledge about dogs in classroom settings. More specifically, my goal is to answer the following question: Which effects of the presence of dogs in schools have been documented by researchers in the field? Furthermore, I investigate the possibilities and limitations of past and present practices associated with animal-assisted interventions. To do so, I present the framework and the methodology utilized in this comprehensive literature review, followed by the steps that were used to obtain the results. The fourth section offers a portrait of these results. The fifth and final section discusses these results and the emerging effects of animal assisted interventions in schools, as well as relationships that can be established between the different types of intervention.

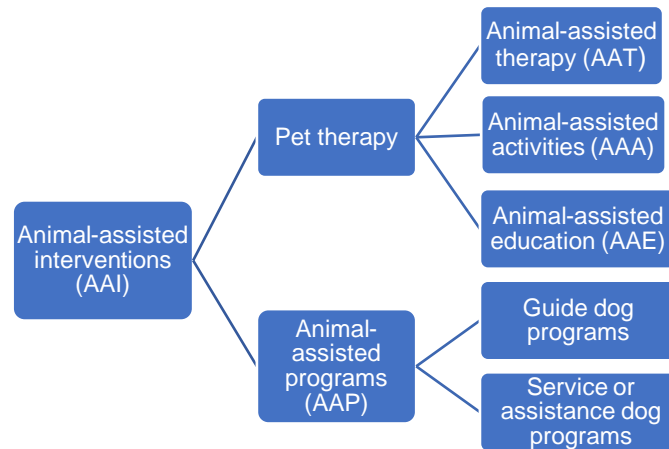
Conceptual Framework

Animal-assisted intervention (AAI) is an umbrella term for the multiple types of intervention that include one or multiple animals at the core of the activity. AAI is a diversified field of study, and Figure 1 offers a visualization of that variety. Schools have integrated a wide range of interventions and programs involving dogs throughout the years, including social-skill training in both small and large reading groups. AAI is a “goal-oriented and structured intervention that intentionally includes or incorporates animals in health, education, and human service ... for the purpose of therapeutic gains in humans” (International Association of Human-Animal Interaction Organizations [IAHAIO], 2018, p. 5).

The first major branch of AAI is *pet therapy*. This approach is characterized by a triangular relationship formed between the individual, the handler, and the animal

(MacNamara et al., 2015). Pet therapy includes three main subcategories. *Animal-assisted activities* refer to casual visits by an animal and its handler (IAHAIO, 2018). The practice can also be used in a therapeutic context where the animal facilitates the process during *animal-assisted therapy*. Pet therapy is referred to as *animal-assisted education* when it takes place in an educational context with pedagogical goals. The animal-assisted education triangle is slightly different from the animal-assisted therapy triangle: the educator replaces the handler, sets goals and objectives, and ensures the safety and well-being of the two other parties. Animal-assisted education is adapted to the needs of the student, including their reading, social skill, and affective needs (Brelsford et al., 2017).

Figure 1. The Umbrella of Animal-Assisted Interventions



Animal-assisted programs, which use dogs to palliate an individual’s disability, is the second major branch of animal-assisted interventions. Dogs are commonly utilized to assist with difficult living conditions such as blindness, autism, or generalized anxiety. Commonly called a “guide dog” when assisting a blind individual and a “service” or “assistance dog” when covering the remaining gamut of disabilities (Assistance Dogs International, 2020), these animals undergo extensive screening and annual re-evaluations to ensure proper regulatory standards. The animal must be trained to help a human partner acquire more autonomy in order to be classified as an assistance or service dog. For instance, a psychiatric service dog could alert a human partner of an imminent panic attack and help that person find the fastest way out of a room.

In the literature, animal-assisted therapy is not always part of the spectrum of animal-assisted interventions. The difference between pet therapy and animal-assisted programs resides in the selection and training of the animals: only certain pet-therapy animals are trained and registered through a pet-therapy program. In contrast, animal-assisted programs only utilize animals that have had specific training designed to answer the needs of a person with a disability.

In the literature, service or guide dogs are commonly referred to as “tools” that assist humans with managing the symptoms of their disabilities: a service dog is often equated with a cane or walker, which aids its blind handler with mobility. However, there is increased awareness that dogs are sentient, living beings because of the companionship and comfort they provide their human partners. Thus, service dogs are now becoming referred

to as “partners” rather than “tools.” These evolving perspectives are opening a vast field of unstudied themes, such as animal well-being and ethics.

According to Bowlby (2005), humans and animals both need affectionate bonds to survive. For children, such relationships are usually nourished by their parents at a very young age. In everyday life, this need can also be fulfilled by peers and teachers. This *theory of attachment* (p. x) can explain the beneficial bond between children and dogs: a service dog provides a sense of security and comfort, which can reduce behavioural issues in its young beneficiary. The lack of rigid and strict social protocol in dogs can benefit humans developing around them, a role referred to as that of *social facilitator* (Servais, 2007, p. 50). When humans meet new people, there are rigid social constructs in place underlying these encounters. Therefore, the presence of an animal facilitates social relationships and the establishment of social contact between people. In a therapeutic context, dogs help patients open up and communicate since the context can be less formal and intimidating. Finally, dogs do not speak, sigh, gesture, make facial expressions, or judge human actions. This creates an environment that benefits observation, focus, and well-being since the student is not required to interpret human gestures and expression. These theories explain the growing interest in setting up programs that answer student’s social and emotional needs.

Methodology

The focus of this review is to extract information from original, empirical studies to address the topic of the effects of animal-assisted interventions on children in school settings. As a result, education professionals and future researchers will have a better grasp of their respective roles in the learning process and the limitations of current research. Moreover, this review will bring others up to date on the literature and potentially lead to a systematic review or future pilot studies.

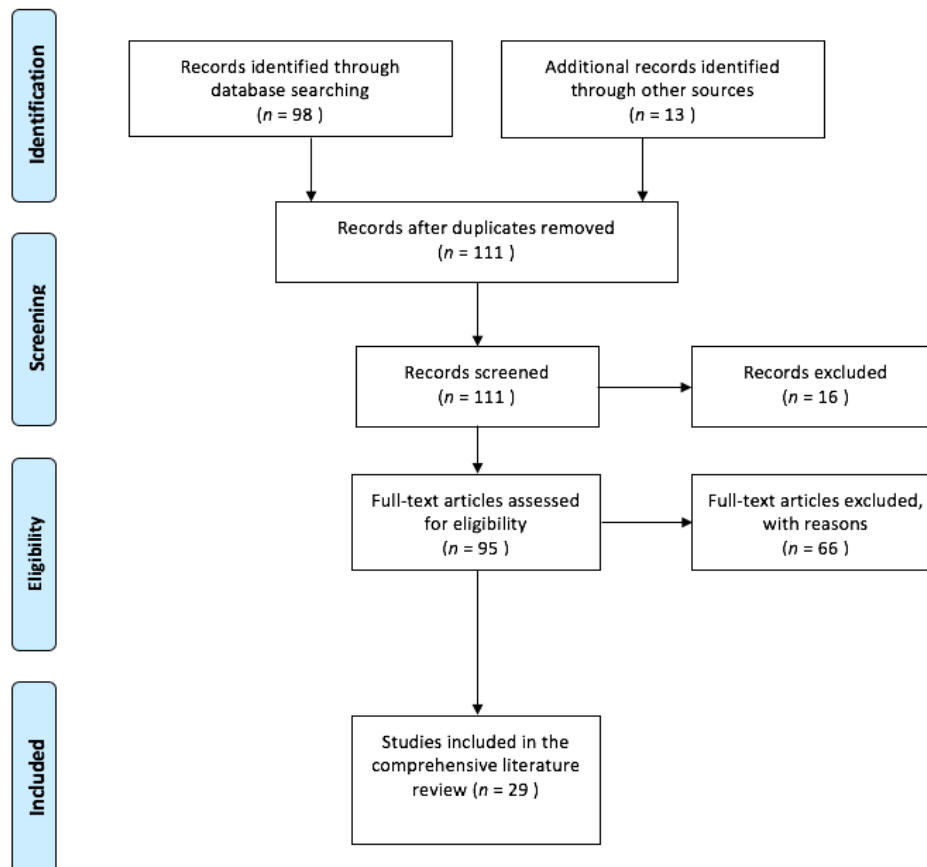
For this article, a comprehensive literature review was conducted using criteria that were specific to the concepts of inclusion and exclusion (Onwuegbuzie & Frels, 2016). In contrast to a systematic review involving a comprehensive quality analysis, a comprehensive literature review aims to provide an overview of the available empirical evidence on a given topic (Onwuegbuzie & Frels, 2016). The studies were (1) classified, (2) organized, (3) analyzed, and (4) reinterpreted so as to provide “an initial indication of the location of the literature relating to a particular issue and [identify] its overall size” (Anderson et al., 2008).

No beginning date was specifically set for what was included in this literature review. The rationale for focusing on a wide timeline was due to the emergence of publications in the field. Rather, a search was conducted for peer-reviewed studies in French and English (the two official languages of Canada) on five online databases that, together, offer a catalogue of research in education and related fields: JSTOR, Erudit, ERIC, PsychLit, and Google Scholar. Through keyword alerts, new publications were also obtained. Specific keywords were combined with an operator (e.g., *AND/ET*) to locate every possible reference in both languages. Keywords used were “therapy dog,” “assistance dog,” “service dog,” “animal-assisted teaching,” “animal-assisted learning,” “pet therapy,” combined with “school setting,” “school,” “children,” “kids,” and “students.” Thesis databases were scanned using a similar technique through Omni, the University of Ottawa library advanced-search platform.

To be considered for inclusion in the review, the evidence had to respect a certain number of criteria pertaining to inclusion and exclusion. Besides containing the keywords, the evidence had to be either a peer-reviewed article, a thesis, or a dissertation. Due to the shortage of studies in the field, master’s theses and doctoral dissertations were included. The publication was required to contain at least one dog explicitly working in a school, as well as participants under 18 years of age. Recreational publications without empirical evidence were eliminated, as were article abstracts and studies that involved unschooled populations. Systematic reviews and meta-analyses were discarded since aggregated data did not fit the requirements fixed for this review. Studies using animals other than dogs was also omitted. These strategies permitted the removal of non-pertinent evidence.

The literature search in databases was conducted between January 2019 and April 2020. Ninety-eight documents found in databases and 13 from thesis search platforms were selected for review and imported into a screening and data extraction software called Covidence. After reading through the 111 abstracts, I excluded 16 due to the presence of exclusion criteria. The remaining 95 documents were then extensively screened using the inclusion and exclusion criteria, and 66 were removed for various reasons, the most common being the absence of empirical evidence. Other reasons included a non-school context, participants over 19 years of age, being a systematic review article, an intervention without animals, and an intervention with an animal other than a dog. Finally, 29 documents were included in the comprehensive literature review. (See Figure 2.)

Figure 2. Flow Diagram Indicating the Number of Records Identified, Included, and Excluded



The extracted data were subsequently organized in an MS Excel spreadsheet specifically designed with the objectives of this review in mind. The following information was recorded when provided by the researchers: document reference (author, title, and year), type of document (article, report, thesis, etc.), research theme, methodology (qualitative, quantitative, or mixed), method of analysis, characteristics of the school environment, participants, type of working dog (teaching partner, assistance dog, etc.), experimental task (when available), duration of the intervention, benefits, limitations, and recommendations identified by the authors. For conciseness, this article will not go into detail on limitations and recommendations.

Results

The characteristics of the literature selected show specific trends in the field of AAI. Out of 29 articles, the majority were peer-reviewed articles ($n = 23$), while the remaining consisted of doctoral dissertations ($n = 4$) and master's theses ($n = 2$). More than half of this literature was published within the last decade. In the school setting, the majority of publications concerned therapy dogs ($n = 25$) while the remaining focused on assistance dogs ($n = 4$). Moreover, the level of the training of the therapy animal varied according to the discretion of the researcher. Of the 25 publications pertaining to AAE, 19 employed therapy dogs, 2 combined therapy and family dogs, and 4 incorporated only family dogs. The last category contained only one case in which the dog had never had contact with children before the study (Anderson & Olson, 2006). Finally, the number of participants varied greatly, from 2 (Kogan et al., 1999) to 230 (Tissen et al., 2007). The average number of participants was 35.

There are seven columns in Appendix 1. The first identifies the study's first author only, year of publication, and the type of document. The second consists of the research objective. The third, fourth and fifth columns describe the participants (cohort size, gender, and age) and dog characteristics (type of dog, number, and type of training). The duration of the research and instruments used in data collection can be found in the description of the intervention. Finally, the last column is dedicated to research outcomes according to the researchers (+ for positive effects, – for negative effects and +/- for neutral effects).

Discussion

The present study identified three recurring themes, which were grouped according to the social-emotional, cognitive, and physiological effects of a dog's presence in schools and presented below. These findings concur with the hypothesis put forth by Gee et al. (2017), who demonstrated that animals influence the cognitive development and academic performance of students. They proposed the hypothesis that animals affect the social-emotional development of children, which later impacts academic performance. Finally, the challenges of implementing such programs are identified. Awareness of these challenges will permit researchers and educational professionals to understand and prevent them.

Social-Emotional Effects

The social-emotional role of the animal can be explained using the model created by Gee et al. (2017), which is supported by the evidence collected in this literature review. According to these findings, the social-emotional effects outweigh the others. Service or therapy dogs acting as social facilitators enhance the relationship between student, peer, and teacher (Anderson & Olson, 2006; Hergovich et al., 2002; Renaud, 2018; Stevenson et al., 2015; Tremblay, 2016; Walter Esteves & Stokes, 2008). In the presence of the aforementioned animals, interactions between peers are more respectful and empathic, while there is a notable reduction in violent gestures, facilitating relationships in the long term (Anderson & Olson, 2006; Hergovich et al., 2002; Limond et al., 1997). Educators have noticed decreased violence and improved behaviour, and the systematic exclusion of students is less commonly seen in the presence of an animal (Becker et al., 2017; Kirnan et al., 2018; Wicker, 2005). Consequently, AAI could potentially promote and support school inclusion and inclusive practices.

Cognitive Effects

An increase in motivation and attention positively affects the child's social-emotional development at school, which in turn has an impact on cognitive development and potentially the student's grades (Bassette & Taber-Doughty, 2013; Beetz, 2013; Broad, 2018; Clune, 2019; Renaud, 2018). The presence of the dog affects the environment by promoting positive emotions during the act of reading. During these programs, students make fewer mistakes and have a feeling of better self-efficacy (Bassette & Taber-Doughty, 2016; Kirnan et al., 2016; le Roux et al., 2014; Moore et al., 2013; Treat, 2013). The dog acts as a social motivator, which is especially helpful when partnered with students demonstrating low motivation, particularly those who do not respond well to traditional teaching techniques (Connell et al., 2019). In the long term, there is greater attention and engagement toward their teacher (Kotrschal & Ortbauer, 2003). As previously mentioned, dogs are non-judgmental and do not react to reading errors, which allows the student to make mistakes and start over without the pressure that would be perceived if another human were present.

Physiological Effects

Due to the fact that dogs act as a social catalyst, students living with a disability who are accompanied by a service dog are less ostracized because of their condition and benefit from increased daily social contact with their peers (Mader et al., 1989; Tremblay, 2016). Moreover, the positive effects of a service dog affect individuals in the surrounding environment. Tremblay (2016) showed that these people noticed a reduction in their own stress and an increase in their well-being in the presence of the animal, which can be attributed to a decrease in the cortisol hormone. Found in the saliva, cortisol is responsible for the body's stress response, commonly referred to as "fight or flight." Increased cortisol levels are found in children with autism who suffer from regular crises, and incidents recur due to the inability of their body's metabolism to lower the hormone efficiently (Viau et al., 2010). Physical contact with an animal, such as petting, has been observed to greatly reduce cortisol levels (Beetz et al., 2011; Viau et al., 2010; Wedl et al., 2015). One study showed

that the family of a child with autism working with a service dog exhibited much lower overall cortisol levels after the service animal joined the household (Fecteau et al., 2017). The same effect has been noted in school contexts in instances where the dog calms the beneficiary, helps avoid crisis, and benefits the well-being of peers and educators (Beetz et al., 2011; Wedl et al., 2015).

During physical therapy, children with special needs working with therapy dogs demonstrated increased movement perception and performance. Students with physical disabilities also exhibited improved memory function and ability to focus, showing a significant enhancement in motor skills and coordination (Nedzinskaitė et al., 2019). Finally, one study also showed that AAI increases the level of oxytocin, the hormone of attachment, in the blood (Beetz et al., 2012). When a student creates a bond with the dog in the classroom, they demonstrate elevated levels of oxytocin, strengthening the bond. Peers and teachers around them also benefit, and the relationships among them are fortified. Therefore, even if a service dog is trained for a sole beneficiary, individuals who interact with the pair also benefit from these physiological effects.

Challenges to Implementation

There is a scarcity of resources and officially recognized animal-assisted programs, which explains the great variety of research methodologies and the lack of continuity within the field. Also, several people indirectly play a role in the success of the dog's integration into a student's life, requiring collaboration between the family, the foundation in charge of the animal (in the case of service animals), and school staff (Tremblay, 2016). Moreover, procedures that determine successful integration of animals in educational contexts can vary based on location, school district, and school, which can complicate the process (Burrows et al., 2008).

The difficulty of establishing one of these programs in a school is not the only negative effect observed. There are health risks associated with bringing a living animal into a school. Even if the dog has adequate hygiene, it most likely sheds fur and leaves behind traces of saliva, which can elicit allergic reactions or increase asthma in susceptible people. Thus, it is imperative to verify the medical records of the school's staff and students who will be in contact with the animal (Tremblay, 2016). Cultural or religious beliefs must also be taken into consideration since some students will not be allowed to come in direct contact with the animal (Walter Esteves & Stokes, 2008). Preventive measures can be put in place to avoid unfortunate incidents, such as a thorough cleaning of the dog's "spot," washing hands before and after contact, and using gloves to touch the animal in the case of students with mild allergies.

There is always a risk that other students can become distracted by the dog during class (Walter Esteves & Stokes, 2008). Though studies have highlighted the positive effect of an animal's presence on attention span for the beneficiary, the reverse can be true for the student's peers. Parents and members of the school administrative staff often verbalize their concerns about these distractions, which can slow down the incorporation of the AAE program or service dog into the classroom (Burrows et al., 2008).

Finally, the negative effects on the animal itself are important to mention. This literature review identified a lack of attention to the well-being of the dog. As noted earlier,

dogs are often perceived as tools rather than living beings. There is the possibility of exhaustion, since the animal is bombarded with noise and distractions in the busy school environment (Burrows et al., 2008). Like humans, dogs require rest periods. Moreover, some trainers do not recommend bringing certain service dogs to school since the animal is a highly social being and the environment will inhibit its ability to focus and work properly (Davis et al., 2004). Trainers should be aware of the environment in which the dog will work when assessing the suitability of a dog's temperament for a specific student. Exhaustion is an even greater risk for therapy dogs that have not been screened or professionally trained by an accredited instructor. These dogs are often not habituated to more rigorous working conditions (Walter Esteves & Stokes, 2008). Partnering with living beings involves concern for the well-being of all parties involved. Finally, it is important to note that the negative effects that have been studied are mostly found in publications concerning service dogs, whereas these same effects are often not examined in research with therapy dogs. Questions should be asked regarding positive bias in the latter as well as validity.

Future Research

This comprehensive literature review aimed to understand the effect of dogs in schools, whether they are therapy dogs or service dogs. More research is needed, particularly in understanding the role of dogs on social-emotional learning, which potentially impacts cognitive learning. It would be appropriate to do more extensive research that integrates an increased number of participants. In addition, it is recommended that the welfare of an animal that is brought into any educational setting be studied. Recently, a new category of service dogs, called *facility dogs*, has been introduced into schools to meet the needs of children with and without diagnoses. These animals are trained and monitored by service-dog organizations to work with a wide variety of students. This approach could possibly address some of the limitations associated with therapy dogs, including the lack of appropriate training for school contexts. More research is needed in the field to assist training facilities with the demands placed on dogs working in the school environment.

A secondary finding of this research is the virtual absence of publications in educational journals, which is exacerbated by the lack of researchers in the field (Anderson & Olson, 2006; Gee et al., 2017). Only a handful of studies in the field of education had been conducted and published by researchers. Why is there a lack of interest or support from the educational community? This reality influences the methodological choices and vision of the authors writing on the subject. A recent recommendation has been made to incorporate children as active participants in the research (Kirnan et al., 2018). This practice would encourage researchers to include students' voices in data collection. To truly understand the impact of dogs on their school life, it is time to let students speak their own truth instead of relying on answers that are inferred by the adults surrounding them.

Conclusion

This comprehensive literature review presented the multi-dimensional effects of dogs in schools based on the empirical evidence of 29 publications. Research analyzed in this

review demonstrated positive social-emotional, cognitive, and physiological effects resulting from the presence of dogs in educational contexts. Moreover, this triad seems to be interrelated: the positive impact of a dog on a student's self-esteem increases their motivation, which ultimately affects their academic skills. The observed physiological effects are notable since they are seen in all individuals who evolve in the context of an AAE program or around the service dog. Cortisol levels are lowered in the presence of a dog, which reduces the negative stress response, while oxytocin increases, thus fortifying positive relationships. These scientific observations explain the success of service dogs working with students with autism and the impact of the dog on the student's surroundings. They also support the great diversity of AAI programs that can be found in publications so far, especially those related to the social-emotional development of students. They support the hypothesis stating that the true value of dogs in schools is based on social and emotional learning, which then impacts cognitive learning and development (as argued by Gee et al., [2017]).

Some negative effects and limitations to AAE programs were identified in this review. Certain students cannot benefit from an AAE program because of social, cultural, and religious beliefs or because of physical conditions such as severe asthma. Moreover, not every student and service dog team can evolve in a school environment. The strenuous conditions that schools place on dogs require an animal that can cope with busy surroundings. It is also important to note that some therapy dogs employed in these studies were not adequately trained or prepared for the experience since working with students can be exhausting, especially over long periods of time. Service dogs, however, are often better trained for this type of environment. The welfare of the animal is often overlooked in publications, though the well-being of the dog is arguably as important as that of the students in avoiding negative incidents or burnout. It is recommended that more research be done in the field of education to further structure the practice and to enhance positive outcomes for students.

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Appendix 1
Empirical Evidence on Service Animals and Pet Therapy in School

Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Anderson 2006 Article	Determine how a dog's presence in a self-contained classroom of 6 children diagnosed with severe emotional disorders that affected their emotional stability and their learning	n = 6 M = 3 F = 3 6–11 y	Students carrying 1–3 diagnoses (oppositional defiant disorder, reactive attachment disorder, attention deficit disorder with hyperactivity, central auditory processing disorder, intermittent explosive disorder, mood disorder, bipolar disorder, Asperger's Syndrome)	Family dog (1) No training	8 weeks preparation, 8 weeks intervention Problem-Solving Sheets and ABC Analysis Forms for emotional crisis displayed by students, daily observations, interviews with students (weekly) and parents (monthly)	+ Benefits for overall emotional stability (de-escalation of crisis) + Benefits for students' attitudes toward school + Benefits for students' responsibility, respect, and empathy
Bassette 2013 Article	Measure the impact of a dog reading program on reading-aloud behaviour in elementary students with emotional and behavioural disabilities (EBD)	n = 3 M = 2 F = 1 7–11 y	Students with EBD and individual educational planning (IEP)	Therapy dog (1)	2 weeks preparation, 4 weeks intervention Quiz, video recordings, observations.	+ Increases in on-task behaviours (maintained over time)
Bassette 2016 Article	Examine the impact of a pet dog on reading skills of EBD students	n = 4 M = 4 F = 0 10–13 y	Students with EBD, below-grade-level reading scores	Family dog (1) No training	3 months Event recording, <i>Elementary Reading Attitude Survey</i>	+ Improvement in reading measures and performance +/- Mixed motivation levels (positive range)

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Becker 2017 Article	Evaluate the effectiveness of an animal-assisted social-skills training group for youth with autism spectrum disorders (ASD)	n = 31 M = 28 F = 3 8–14 y	Students with ASD (including Asperger's disorder or pervasive development disorder not otherwise specified)	Therapy dog (1) Certified	12 weeks Assessments of depressive symptoms, theory of mind ability, and social skills of students. Rating scale of social behaviours associated with ASD symptoms designed as a teacher rating scale (SRS-2)	+ Reduced autism-related symptoms (self- and teacher-rated) +/- Improved theory of mind (both groups); decreased feelings of isolation and overall depressive symptoms (over time, effect not significant); no difference on Social Language Development Test
Beetz 2011 Article	Determine whether boys with insecure-attached attachment would profit more from presence of a dog, friendly human, or toy dog during a stressful task	n = 31 M = 31 F = 0 7–12 y	Boys with insecure-disorganized attachment	Therapy dogs (Number not specified) Trained or certified	2 weeks Salivary cortisol recorded before, during, and after Trier Social Stress Test for Children	+ Significantly lower stress level (cortisol) with real dog; positive relation between contacts with dog and decrease in stress levels +/- Self-reported stress levels did not differ
Beetz 2013 Article	Investigate effects of a school dog and teacher team on socio-emotional experiences, depression, emotion-regulation strategies	n = 46 M = 23 F = 23 8–9 y	Students with insecure-disorganized attachment	School dog (1)	1 school year Depression scale for children, questionnaire on emotional and social experiences in school, questionnaire on emotion regulation in children	+ Improvement of attitude toward school and emotions related to learning for the entire class

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Broad 2018 Doctoral dissertation	Discover the role of school dogs, specifically in therapy and learning	<i>n</i> = 15 Gender and age not specified	Students from two schools in highly deprived areas of England	Therapy dogs (3) Not certified	Duration not specified Observations, interviews	+ Support for specific children struggling to function well in school + Indirect impact on academic achievements from therapeutic effects
Burrows 2008 Article	Identify and describe the factors influencing an autism service dog's performance and the impact on welfare	<i>n</i> = 11 Gender and age not specified	Children with autism	Service dogs (11)	12 months (5 teams) and 6 months (6 teams) Interviews, observational data	+ Being part of the school routine helped the dog learn the general routine faster
Clune 2019 Doctoral dissertation	Examine how a reading intervention with a therapy dog affects fluency, anxiety, motivation, and self-efficacy among 3rd-graders with dyslexia	<i>n</i> = 7 M = 5 F = 2 8–9 y	3rd-grade students with dyslexia	Therapy dog (1) Trained, registered with Pet Partners	7 weeks Pre- and post-intervention data measured by easyCBM Passage Reading Fluency Assessment, Abbreviated Reading Anxiety Questionnaire, Motivation to Read Profile; individual interviews with teacher; observational data	+ Increase in reading fluency, decrease in levels of anxiety, increase in reading motivation and self-concept as readers
Connell 2019 Article	Evaluate the benefits of three settings of dog-assisted reading programs	<i>n</i> = 63 M = 27 F = 36 6–8 y	Grade 1 and Grade 2 students in an Australian school	Therapy dogs (7) Public access certifications	4 weeks York Assessment of Reading for Comprehension, Single Word Reading Test, Reading Rate, Reading Accuracy, Reading Comprehension; YARC	+ Improvements in reading ability for all three programs, especially for students with lower abilities

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Davis 2004 Article	Evaluate the outcome of placing assistance dogs in the pediatric population	<i>n</i> = 16 Gender and age not specified	Children with a service dog to mitigate their disability	Service dogs (16) Trained, placed by an organization	One time only Semi-structured open-ended interview (open and closed questions)	+ Benefits identified for the majority, mostly social and cognitive, but also physical and medical
Hergovich 2002 Article	Examine the effects of the presence of a dog in the classroom on field independence, social competence, empathy with animals, and social-emotional atmosphere	<i>n</i> = 46 M = 23 F = 23 6–7 y	1st-graders in Austria (economic migrant families)	Therapy dogs (2) Family dog (1)	3 months Analysis of intelligence test, social intelligence test, self-assessment of empathy with animals. Teacher assessments of their pupils with respect to sociability, social integration, aggressive behaviour	+ Enhancement of field independence, empathy with animals; benefits to development of autonomous functioning, segregation of self/non-self, social integration (teacher point of view) and rate of aggression
Kirnan 2018 Article	Examine the effect of a dog-assisted reading program on special education students	<i>n</i> = 4 M = 4 F = 0 6–11 y	Students in an inclusive special education classroom	Therapy dogs (Number not specified)	2 years, weekly reading sessions Behavioural data recorded daily by the teacher, interviews with teachers and educators	+ Behavioural improvement for 1 student

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Kirnan 2016 Article	Examine the effects of a therapy dog program on reading	<i>n</i> = 169 M = 85 F = 84 kindergarten–10 y	Regular students in kindergarten through Grade 4	Therapy dogs (Number not specified) “Tested”	N/D Standardized reading scores, interviews with teachers and dog handlers	+ Improvements in reading and writing skills, attitude and enthusiasm for reading (greatest gains with struggling readers, special education, ESL) +/- No difference in scores for students from Grade 1–4
Kogan 1999 Article	Assess the potential of animal-assisted therapy for emotionally-disturbed (ED) children	<i>n</i> = 2 M = 2 F = 0 11–12 y	Students displaying emotional disturbance in self-contained ED classroom with individual education plan	Therapy dog (1)	5 months, 40–45 minutes every week ADD-H Comprehensive Teacher Rating Scale, direct observations, videotapes of therapy sessions, post-intervention interviews (participants, families, educational professionals)	+ Positive outcomes on sense of control over the environment; decrease in immature acts and learned helplessness.
Kotrschal 2003 Article	Test short-term effect of a dog on children’s behaviour, social interactions, and on teaching situations	<i>n</i> = 24 M = 13 F = 10 6–7 y	1st-grade Austrian classroom, mainly from first-generation immigrant families	Therapy dogs (2) Family dog (1)	2 months (1 month without the dogs and 1 month with) Observations from focal sampling and scan sampling	+ Better social homogeneity of the group, decrease in behavioural extremes, integration of excluded students, increase in attention on teacher. More effects on boys than girls.

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
le Roux 2014 Article	Evaluate the effects of an animal-assisted reading program on reading rate, accuracy, and comprehension of 3rd-grade students	<i>n</i> = 102 Gender not specified 7–13 y	Afrikaans-medium elementary school in a low socio-economic community in the Western Cape, South Africa,	Therapy dogs (9) Trained	18 weeks Demographic questionnaire, Neale Analysis of Reading Ability	+ Positive impact on some reading skills of the students who read to a dog
Limond 1997 Article	Investigate the effects of a dog on the behaviour of children with severe learning disabilities	<i>n</i> = 8 M = 2 F = 6 7–12 y	Students with Down's syndrome at a school for children with severe learning difficulties	Therapy dog (1)	6 weeks (8 sessions) Observations using a repeated-measure design	+ Improved focus, which contributed to positive, co-operative interactions between the child and the adult
Mader 1989 Article	Examine the social acknowledgement of children with a disability in wheelchairs when a service dog is present	<i>n</i> = 5 M = 2 F = 3 10–15 y	Students in wheelchairs (limited mobility)	Mobility service dogs (5)	2 hours Observations	+ Increase in social acknowledgements with the service dog, mostly in unfamiliar settings, which reduces social isolation
Moore 2013 Article	Examine changes in children's implicit theories of reading ability for self, others, and animals	<i>n</i> = 71 M = 32 F = 39 8–9 y	3rd-graders	Therapy dog (1)	4 months Repeated measures analysis of co-variance (ANCOVA)	+ Improvement in students' implicit theories of reading ability +/- Participating in the entity condition increased incremental scores more than did participating in the incremental condition

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Nedzinskaitė 2019 Article	Evaluate whether dog-assisted therapy sessions can benefit the outcome of physical therapy for children with a mental disability	n = 28 M = 13 F = 15 9–19 y	Children with a mental disability	Therapy dogs (6)	2 months Bruininks-Oseretsky motor skills evaluation test (short version), Isometric torso muscle endurance tests based on Ito, McIntosh, and McGill. Ability to focus on and memorize exercises and ability to understand and perform them were also evaluated	+ Improvement in movement perception and performance, ability to focus and memorize movement sequels, torso muscle static endurance, fine motor skills, and coordination
Renaud 2018 Master's thesis	Explore the perceptions of students and teacher regarding the effect of a dog on classroom climate	n = 15 M = 13 F = 2 12–13 y	7th-grade students and their teacher	Family dog (1) Untrained	8 weeks Questionnaires, semi-structured individual interviews and focus groups, teacher's logbook	+ Improvement in interpersonal relations, improved sense of belonging, increased pleasure and engagement associated with learning
Stevenson 2015 Article	Determine if sessions with a dog can be used to motivate students with autism to increase their social interaction and engagement with their teacher	n = 3 M = 3 F = 0 7–13 y	Students with a diagnosis of autism	Family dog (1) Untrained	10 weeks (5 sessions) Observations in semi-standardized sessions; measures focused on social behaviours, negative or repetitive and autistic symptomatology	+ Increase in meaningful social interactions with dog and teacher, reduction in solitary or repetitive behaviours, generalization effects

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Tissen 2007 Article	Examine the effects of different training methods on social behaviour, empathy, and aggression in children	n = 230 M = 109 F = 121 7–10 y	3rd-grade classes from 3 different Viennese elementary schools	Therapy dogs (Number not specified) “Tested”	10 weeks Questionnaire before and after the program (teachers and students), 3 weeks later (students only)	+ Improvement in social behaviour and empathy, greater respect for one another, decrease in aggression +/- Greater empathy irrespective of program, but unstable over time
Treat 2013 Doctoral dissertation	Determine if the presence of a therapy dog increases the reading performance of students with learning disabilities on reading tests	n = 9 M = 4 F = 5 7–10 y	Students with identified learning disabilities	Therapy dog (1) Certified	Duration not specified, 10 reading sessions Pre- and post-testing on Gray Oral Reading Test, Basic Reading Inventory Reader Self-Perception Scale, anxiety scale; pre- and post-intervention interviews (parent) Student questionnaires, reading journals	+ Increase in reading skills, feelings of self-efficacy, motivation to read. Decrease in anxiety
Tremblay 2016 Master’s thesis	Describe the perceived relation of autism service dogs on the development of teenagers with autism, in both school and family context	n = 2 M = 1 F = 1 14–17 y	Teenagers with a diagnosis of autism	Autism service dogs (2)	1 month Semi-structured open-ended interviews, observations, students’ journals	+ Better social participation. Improves symptoms, troubles, characteristics of the disability. Efficient in the long term (years), Benefits for immediate surroundings

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.

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Study ¹	Research objective	Participant details			Intervention description	Outcomes ³
		Cohort ²	Characteristics	Dog		
Walter Esteves 2008 Article	Analyse the effects of the presence of a dog on social interactions between children with developmental disabilities and their teacher	<i>n</i> = 3 M = 2 F = 1 5–9 y	Children with intellectual disabilities attending special education program. 2 have Down's syndrome; 1 has hearing impairment	Therapy dog (1) In training	8-minute sessions, 5 days per week Observations, videotaping	+ Increase in positive initiated behaviours toward the teacher and the dog, decrease in negative initiated behaviours, improved social responsiveness
Wedl 2015 Article	Investigate differences in social behaviour and in physiological responses of children with disorganized or insecure-avoidant attachment during a stressful situation with a therapy dog	<i>n</i> = 19 M = 19 F = 0 7–11 y	Male children with disorganized or insecure-avoidant attachment	Therapy dog (1)	2 weeks Trier Social Stress Test for Children (TSST-C), salivary cortisol records, observations through videotaping	+ Increase in communication and physical contacts for boys with disorganized attachment; transfer of attachment representations from human to dog
Wicker 2005 Doctoral dissertation	Investigate the effects of animal-assisted therapy in enhancing social, behavioural, and interpersonal skills of teenagers	<i>n</i> = 31 M = 22 F = 9 12–17 y	Teens at risk for expulsion and/or adjudication	Therapy dog (1)	10 weeks Pre and post-test, semi-structured interviews with staff and students	+ Positive impact on student behaviour according to staff, increase in self-confidence +/- No difference according to the <i>t</i> -test

Note. ¹First author, year of publication, type of publication. ²M = male, F = female, y = years old. ³+ = positive outcome, - = negative outcome, +/- = mixed outcome.