



## Research Article

# Animal-assisted education: Perception of teachers and parents on the impact of the DOG project

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## Abstract

**Introduction:** Research regarding Animal-Assisted Education (AAE) is a relatively new field. Due to the growing number of programs in the field, investigating AAE interventions is important. The aim of this study was to gain insight into teachers' and parents'/caregivers' perceptions of the impacts of a specific form of Animal-Assisted Service (AAS, formerly Animal-Assisted Intervention (AAI) namely, an Animal-Assisted Education (AAE) program for primary school students, as offered in the Netherlands.

**Materials and methods:** This study was designed as an exploratory qualitative study, executed by means of interviews using a semi-structured questionnaire. Twelve teachers and ten parents/caregivers were interviewed. The analysis started with open coding and was followed by axial and selective coding.

**Results:** There is significant agreement regarding the positive influence of AAE on the perception of teachers and parents. Both notice an impact beyond the context of the AAE sessions in the areas of communication, social-emotional development, self-confidence, and environmental factors. Teachers also note that the AAE project has provided them with insights that influence their professional development.

**Conclusion:** It can be cautiously stated that 10 sessions, according to the DOG project, had a positive impact on the social-emotional development of elementary school students according to their parents and teachers. Further research on what AAE means for students is recommended. Considering the unforeseen and impactful outcome of this playful interaction initiative on teachers, it is advised to conduct subsequent research to further explore the underlying mechanisms, aiming to enhance the professional development of teachers.

## Introduction

It is a sunny morning in a small room of a village school. The space is used as a library, and this morning it is filled with student, Luca, the dog-assisted teacher, Ida, and me. Luca beams with excitement, holding the leash of the dog, Bono, who wags his tail happily. Luca is ready to begin the task he has just been given: a retrieving exercise with Bono.

*The dog looks expectantly at Luca, following his every move with his eyes, waiting for the starting signal. Luca's face is focused as he releases Bono and calls "fetch". Bono dashes forward to retrieve the toy placed a few meters away.*

*The tension is palpable as Luca holds his breath, watching Bono with his ears flapping as he runs to fetch the toy, grabs it, and turns back. Bono holds the toy securely in his mouth and runs back to Luca,*



*making a little curve before returning. He visibly enjoys the toy he has been allowed to retrieve. Once Bono stands before Luca, Luca stretches out his hands again, clearly saying “fetch” once more. Bono then places the toy in Luca’s hands, who gleams with pride and quickly drops a treat for Bono.*

*Bono enjoys his reward and looks expectantly at Luca again, as if to say, “Are we going to play another fun game?”*

An unexpected but increasingly recognized contributor to education is the presence of dogs, as described in the example above. This is a form of the fast-developing field of Animal-Assisted Education (AAE), which constitutes a specialized form of Animal-Assisted Services, targeted at children and young adults as part of the broader spectrum of Animal-Assisted Services (AAS) [1]. Implemented deliberately and systematically by trained educational professionals, the aim of AAE is to foster the academic, socio-emotional, and cognitive development of students in educational settings [2].

### Theoretical framework

Over the past two decades, numerous studies have explored the effects of Animal-Assisted Services (AAS), formerly known as Animal-Assisted Interventions and Human-Animal Interactions (HAI). Animal-assisted interventions bring forth distinctive features and are subject to a growing number of research studies and scientific exploration.

AAE is a special form of AAS in which a professionally trained and qualified dog-assisted teacher (with a degree) promotes the academic learning, social emotional- and cognitive development of students. This takes place in the form of a planned, targeted program that is evaluated. The assisting dogs are trained and approved with a focus on animal welfare (see also 2.2). There are many aspects to AAE. Physical contact, deemed vital for children’s overall development, especially within educational contexts, is underscored by a large body of research evidence [3-7]. Renowned figures in pedagogy, such as Langeveld (1979), mentioned by Mulderij [8], accentuate the unique nature of the pedagogical bond, emphasizing ‘responsibility’ as its cornerstone. This responsibility is shared between teachers and parents, who jointly nurture children and students, recognizing the interconnectedness within this relationship. Active interaction, both between teachers and students and among students themselves, presents challenges in regulation [9,10].

Candia, Cristian and Pulgar and Javier, Pinheiro, and Flávio [11] further elaborate on this interconnectedness, after the principles of enactivism [3], which emphasizes dynamic interconnection and mutual embodied attunement. This connection can exist in human-human relationships and in human-animal relationships. One such elaboration of this is that of enactive anthrozoology as underpinning human-animal interactions (HAIs) [12].

The introduction of active physical interaction between animals and humans, as facilitated by AAE, addresses children’s tactile needs, and fosters positive behavioral development [12,13]. A literature review by Verhoeven, Enders-Slegers, and

Martens [14] highlights the motivating effect of animals in the classroom, with attention given to ethical considerations and the development of empathy. The reciprocal physical and playful interaction between children and animals during sessions appears to have a positive impact on students’ development [4-7]. Play serves as a universal language and plays a crucial role in children’s development [15]. Engagement in play is driven by inner, intrinsic desires in that it is enjoyable and ‘fun’ to participate. Play lays the groundwork for subsequent academic learning across various domains, such as literacy, science, social studies, and mathematics, while also promoting executive functions, like emotional regulation, planning, and memory [16]. Similarly, play is essential for animals, fostering skill acquisition, social behavior, and cooperative living [17]. According to Ryan and Deci [18], play functions as a mechanism for intrinsic motivation.

The employment of AAE also has a strong link to the implementation of play in education since most animal-student interactions can be described as playful. In addition to AAE, there is another animal-assisted intervention: Animal-Assisted Play Therapy (AAPT). AAPT is a specialized subset within the realm of Animal-Assisted Therapy (AAT), where animals are integrated into the context of play therapy [19,20]. Play therapy enables children to act out problems without explicit verbal communication or cognitive processing, tapping into their innate inclination to enact their world, thereby allowing them to express feelings, motivations, and struggles through symbolism and metaphors [19,20]. The fundamental characteristic of play therapy is its utilization of play as the primary “language” or mode of interaction during sessions [19,20]. AAPT has garnered broader acceptance and recognition as an intervention that can sometimes succeed where other interventions have failed. Animal-Assisted Education (AAE) represents a powerful combination, capable of enhancing children’s learning experiences and fostering their personal growth. Hence, it is imperative for us to endorse this practice to furnish children with an optimal educational experience that equips them with a successful future. Exploratory studies support the positive impact of AAE with dogs on student development, particularly in enhancing social-emotional functioning [21-23].

Although a unified model for AAE remains elusive, a consensus has emerged regarding its favorable effects on cognitive and social-emotional behavior, as well as physiological responses [14]. Emerging indicators encompass various aspects, such as self-perception, enjoyment, a sense of happiness, playfulness, relaxation, engagement in challenges, and levels of physical and affective contact [14].

The integration of AAE into educational practices not only demonstrates significant improvements in social-emotional aspects but also underscores the positive interplay of embodied interactions between humans and dogs, affirming the principles of enactive anthrozoology [23].

Many aspects of AAE are under-researched and in need of further exploration [14,24]. Recognizing this knowledge gap, the current research is undertaken to involve teachers



and parents/caregivers (hereafter referred to as parents) of students engaged in AAE. This study seeks to answer the following question: What are the perceptions of teachers and parents regarding the influence of AAE on the behavioral and emotional development of elementary school students aged 8 to 13 years?

## The DOG project

The context of this research was the DOG project, as part of a partnership of 45 cooperating primary schools. Students between the ages of 8 and 13 were indicated for participation in the program by specialized staff members of the partnership. Therefore, there is a broad scope in terms of the age of the students who participated in this study. Criteria for participation in the program were used by the partnership. Students had to have a request for help that the regular educational program could not answer, and these were requests for help in the field of social-emotional development. The DOG Project is part of the regular extra offer of the partnership. In addition to this project, there are, for example, programs such as play therapy, speech therapy, or a program in which students work with a horse. In the DOG Project, a dog-assisted teacher works with three trained and specialized dogs. These dogs are examined every year.

**Each student follows a program of ten sessions (Table 1). The structure of each session is as follows:**

- **Opening:** How was the past week, what are we going to do today, and why are we doing this?
- Introduction of the theme.
- **Exercises with the dog. Themes:** Care and trust; being expressive and effective in body language; relationships; leadership; safety.
- **Closing:** What is the student's experience of this meeting; summary and agreements.

From the sessions, the student takes activities into the classroom. For example, the student makes an agreement not to shout out in the classroom. Each time the student does not do this but raises their hand, the classroom teacher gives the student a treat for the dog. This allows the student to earn reward dog treats for the next session. The highly qualified and trained dog-assisted teacher, who carries out the program, coordinates with the students' teacher. There is also the possibility for the parent(s) to participate in a session.

## Materials and methods

### Study design and population

This study was designed as an exploratory qualitative study and was executed by means of interviews. It aimed to explore the influences of AAE on students, as perceived by teachers and parents. Participants were specifically sought and included based on certain characteristics. The inclusion criteria for teachers and parents were that a student participated in the AAE program, as offered by the collaborative elementary

schools, namely, the DOG project, and that the teacher was employed on the day the student participated in the program. The inclusion criterion for parents was that they have legal custody over the student.

For each of the two populations, we aimed to interview twelve respondents between 2016 and 2019. The conclusive experimental cohort reached the threshold of "theoretical saturation" [25,26]: for teachers, no further pertinent data surfaced after 12 interviews, and for parents, no additional relevant information emerged after 10 interviews.

This study was approved by the Research Ethics Committee of the Open University, Heerlen (approval date 16 December 2015, U2015/08468/HVM).

### Procedure

In the collaborative elementary schools, 45 schools work together, with their expertise center offering extra support to students aged between 8 and 13 years old. Examples of this support are speech therapy, play therapy, working with a horse, and working with dogs [27]. The DOG project, which involved AAE with dogs, was led by a specialized dog-assisted teacher, providing interventions to students in a room adjacent to their classroom within the school. Three trained male dogs participated during the period 2017–2019: a flat-coated retriever–golden retriever mix, a flat-coated retriever, and a flat-coated retriever–German shepherd mix. The dogs participating in the program were owned by the dog-assisted teacher who carried out the program and was specialized and trained in working with students and dogs.

In 2014, the collaborative elementary schools were asked to cooperate in a study of the AAE program they offered. The dog-assisted teacher, executing the program, was also asked to cooperate. The researcher joined the program so that it became a natural fit for the dog-assisted teachers, the dogs, the schools, and the students. The students were recruited according to the guidelines of the partnership. In short, this meant that an elementary school could sign up a student for an additional provision such as this AAE intervention. The AAE intervention was designed to help students with their social and emotional development.

Prior to the start of the program, the involved classroom teacher and parents of the student were approached for participation in the study and provided with an information letter detailing the study's objectives. Parents were required to sign a consent form for their child's participation, with the option to withdraw at any point during the study. The collaborative elementary schools took care of all procedural matters such as insurance. The DOG project consisted of ten weekly sessions for individual students (Appendix A). It started with an introductory meeting, followed by eight training sessions and a closing presentation. The first session served to introduce the program and the dogs to all classmates and the teacher. In the tenth session, the students presented in the classroom what they had achieved during the program.



**Table 1:** Overview of the session themes.

Session theme	Exercises with the dog
Introductory meeting.	Not specified.
2. Contact o Observe o Relation o Safety	Getting to know the dog: - On a leash. - Sitting.
3. Care and trust o Observe o Communication: Be expressive and effective in body language. Non-verbal communication: - Body language - Facial expression - Appearance - Smell - Sounds - Tension o Relation o Lead o Safety	Greeting rituals. Leading: coming, sitting, lying down Attention exercises, following, trail running. See, understand, and apply body language.
4. Communication o Observe o Communication: Be expressive and effective in body language. Non-verbal communication: - Body language - Facial expression - Appearance - Smell - Sounds - Tension o Relation o Lead o Safety	Greeting rituals. Attention exercises, calling by name, rewarding, and ignoring. Leadership: assignment: 'here' and 'sit', leashing the dog. See, understand, and apply body language.
5. Develop communication o Observe o Making trade-offs o Decisions o Make a choice. o Communication: Be expressive and effective in body language. Non-verbal communication: - Body language - Facial expression - Appearance - Smell - Sounds - Tension o Relation o Lead o Safety	Greeting rituals. Attention exercises, calling by name, rewarding, and ignoring. Leadership: assignment: 'here' and 'sit', play games with the dog, walk on a leash with the dog. See, understand, and apply body language.
6. Play o Observe o Making trade-offs o Decisions o Make a choice o Communication: Be expressive and effective in body language. Non-verbal communication: - Body language - Facial expression - Appearance - Smell - Sounds - Tension o Cooperate o Relation o Lead o Safety	Greeting rituals. Attention exercises, calling by name, come and sit. Leadership: fetching, playing games with the dog, walking on a leash with the dog. See, understand, and apply body language.
7. Difficult	The above exercises but at a higher pace, with an increase in difficulty. Greeting: come, sit, follow attention exercises, follow Apport and lay down.
8. Working together	Greeting rituals. Attention exercises, calling by name, rewarding, and ignoring. Leadership: Giving assignments, playing games with the dog (increasing in difficulty), walking a trail with the dog on a leash, collaborating with others and the dog See, understand, and apply body language.
9. strengthen and improve	The student chooses which parts he/she still wants to practice with the dog. Furthermore, several exercises learned during the sessions and repeated to conclude and prepare for the final presentation.
10. Presentation in the classroom	The student presents in the classroom



Each session consisted of parts with and without a dog. During sessions 2–9, the students invited a classmate to participate. Each session ran for an estimated 60 min, in which the dog participated for 15 to 20 min. During the week, multiple students participated in the program, which was conducted over four separate days. The program and the dogs were free during vacations (12 weeks a year). Each day, a maximum of two students could participate, and, typically, a dog took part in one session per day.

The guidelines of IAHAIO for working with animals in AAS were followed: the well-being of the dog was closely observed, and, under signs of stress, the session would end immediately. The dog-assisted teacher had a car specially equipped for the dogs' transportation to the schools. Each dog had its own resting place inside where they stayed before and after the session. Each dog wore a vest indicating that they should not be petted without permission. During the part of the session involving the dog, the handler/teacher brought along a mat for the dog to lie on. Prior to each session, agreements were made and reiterated with the students regarding their interaction with the dog.

### Recruitment

Following inclusion, teachers and parents of students involved in the DOG project throughout the academic years 2016–2019, and whose parents provided informed consent for the study, were invited to take part in an interview. The participating students attend various schools and classes within the collaborative elementary schools. The parents and teachers received an information letter about the study and a request to participate. The letter included information on how the collected data would be handled (for instance, on the assurance of anonymity).

### Interviews

This exploratory qualitative study was based on grounded theory [28–30]. The core of this method is that theories are inductively generated from the collected data. This latter point is crucial: the codes, categories, and theories are developed from

the data and not from the researcher's presupposed hypotheses [31]. The aim of this qualitative research methodology was to generate theories grounded in empirical data. Grounded theory begins with a process of inductive reasoning, allowing theories to emerge from the data. This approach is particularly useful in exploring complex social phenomena, where little existing theory exists, allowing researchers to delve deeply into the experiences and perspectives of participants.

The process of data collection, coding, and analysis in open coding to identify initial concepts or categories is iterative. These concepts are then systematically organized through axial coding, where relationships between categories are explored, and selective coding, where a core category or central phenomenon is identified [30].

The interviews were conducted using a semi-structured questionnaire. The main objective of the interview was to assess how parents and teachers experienced the participation of the children in the DOG project and to gain insight into the socio-emotional development of the students.

The interview questions are divided into four fields: (1) choice for the DOG project, (2) experience with animals, (3) impact of the DOG project, and (4) experience with the DOG project. During the interview, the interviewer allowed for flexibility in terms of the order, and questions could be added depending on how the conversation progressed. The interviews were conducted by the interviewer. A junior researcher participated in some of the interviews. To ensure that respondents were as comfortable as possible, an extra five minutes was scheduled before each interview. This allowed time for a brief introduction and an overview of the interview. The Topic 1 interview questions address the reasons for choosing the program. The Topic 2 questions delve into the students' experiences and familiarity with animals. Topic 3 focuses on the perceived effectiveness of the program. In case of further inquiries, questions were asked about verbal and non-verbal communication, group dynamics, and relationship building. The last topic, experiences with the program, asked about how parents/teachers experienced the program and whether they would recommend it to others.

### Data analysis

The interviews were recorded using a voice recorder. This was communicated to the respondents prior to the interviews. To ensure the reliability of the analyses, multiple researchers analyzed the interviews. The research process proceeded cyclically, with a first and second interim analysis conducted after the initial interviews. The interviews were transcribed and then coded in three steps [32,33].

The processing of the transcripts of the observations and interviews was conducted following the grounded theory method by Glaser and Strauss.

The simultaneous involvement of the researcher in data collection and analysis was crucial. Maso and Smaling [32] describe how the researcher is in a continuous cycle of incubation, confrontation, and generation. Each cycle produces

#### Appendix A: The DOG Project.

The structure of the sessions was as follows:
Opening: How was the past week, what are we going to do today, and why are we doing this?
Introduction of the theme.
Exercises with the dog. Themes: care and trust; being expressive and effective in body language; relationships; leadership; safety.
Closing: What is the students' experience of this meeting; summary and agreements.
From the sessions, the student takes activities into the classroom. For example, the student makes an agreement not to shout out in the classroom. Each time the student does not do this but raises their hand, the classroom teacher gives the student a treat for the dog. This allows the student to earn reward dog treats for the next session. The highly qualified and trained dog-assisted teacher, who carries out the program, coordinates with the students' teacher. There is also the possibility for the parent(s) to participate in a session.
Below is an overview of the session themes, with corresponding exercises with the dog:
Overview of the session themes with corresponding exercises with the dog (refer: Table 3):

new but preliminary ideas, which are then explored and confirmed or denied in a new cycle. In our study, this approach provided the researcher with the opportunity and freedom to adjust the research design if necessary for its quality. Among other things, the researcher could supplement the topic list for the interviews based on these interim results and ideas. Each reflection and analysis yielded new questions.

These preliminary ideas were recorded by the researcher in substantive and methodological memos. These were personal notes, in which the preliminary ideas or codes from the analysis were clarified. This clarification involved the researcher taking time to continually compare data and codes to arrive at more abstract ideas. This method is known in grounded theory as the 'constant comparative method'.

Specifically, each fragment of each transcript was assigned one or more codes. Text fragments with the same codes were compared. Sometimes, different codes could be merged into a core category at a higher level of abstraction.

Thus, from isolated codes, trees of interconnected categories emerged. Analysis and reflection on these categories led to the research results. Therefore, staying as close as possible to the data through the interviews was crucial. By minimizing the distance between data and results, validity could be ensured. In terms of internal reliability, researcher triangulation was employed. The senior researcher could evaluate the interpretations of the junior researchers for accuracy and validity, thereby contributing to the quality of the analysis and results. Internal validity was achieved by adhering to the research method, in accordance with the grounded theory approach [28,30].

## Results

During selective coding, five main codes were identified (Figure 1). These main codes were further elaborated into determining factors and the transitionality of the students' developments to situations outside the sessions of the DOG project.

### Teachers

*'Her mindset was always that bad things could happen. As a result, she instinctively set up barriers to shield herself. The Dog project has helped her. She has learned that she can just do things and that that's nice'.*

The perception of the interviewed teachers regarding the five distinguished codes is presented in Table 2.

### Parents

*'You noticed that he became calmer, but also could express himself more easily. Earlier, you could turn things upside down, but he wouldn't talk. And suddenly, you noticed; he still says the first answer is 'no, everything's fine' or 'I don't know'. But if you ask further, now he does tell what's on his mind.'*

The perception of the interviewed parents regarding the five distinguished codes is presented in Table 3.

## Discussion

This study investigated the perceived impact of AAE by both teachers and parents on the social-emotional development of students and revealed parallels in their experiences. Both groups perceive generalizable effects in the areas of communication, social-emotional development, self-confidence, and environmental factors. These effects are consistent with previous research on AAE [23].

The teachers indicate a significant positive change in the students who have participated in the DOG project. According to them, there are various reasons why a student is referred to the DOG project. For instance, a teacher mentions a girl who participated, who spoke very unclearly and softly and was very introverted. The goal was to present herself more confidently. According to this teacher, many students are referred to the DOG project because they are very insecure. With the help of the dog, they learn to set boundaries and assert themselves. Another teacher describes a boy who used to get into fights with other students on the playground. This boy participated in the DOG project and showed clear improvement in his behavior. If there is an issue on the playground now, he comes to the teacher for help, and the situation is resolved in a non-fighting manner. The student received tools from the trainer to work on this, and the dog has been a supportive factor. The teachers clearly see that a dog has a significant effect on the student's behavior. One teacher describes how an intervention with an animal can reach the student in a different way. The dog doesn't speak and primarily provides non-verbal support to the student. When something is wrong a teacher often wants to discuss it right away. However, it's more helpful for the student to first find calmness and be able to express emotions to the dog before engaging in conversation. One notable point from the interviews with the teachers is their positive experience with the collaboration with the dog-assisted teacher. This person is a familiar face to both teachers, parents, and students. The teachers find the dog-assisted teacher very approachable and professional. They receive feedback after each training session, which they can then incorporate into their guidance of the students in the classroom. They also receive advice on how to interact with the student. Another teacher notices that many other teachers come to the dog-assisted teacher for advice regarding a student. Teachers mention that the students can clearly articulate what they have learned after the DOG project, showing increased self-awareness. Another positive effect noted by the teachers is that the student participating in the DOG project gets to bring a different classmate to each session. It makes the selected students feel honored to participate and ultimately changes how other classmates perceive them, as they see how well they interact with the dog. This increases respect for the students participating in the DOG project.

Similarly, the parents are positive about the training sessions of the DOG project. The children have participated in the DOG project for various reasons. For example, a student was very shy and withdrawn before starting the DOG project. She was clingy and found it difficult to stand up for herself. Significant development was quickly seen during and after this

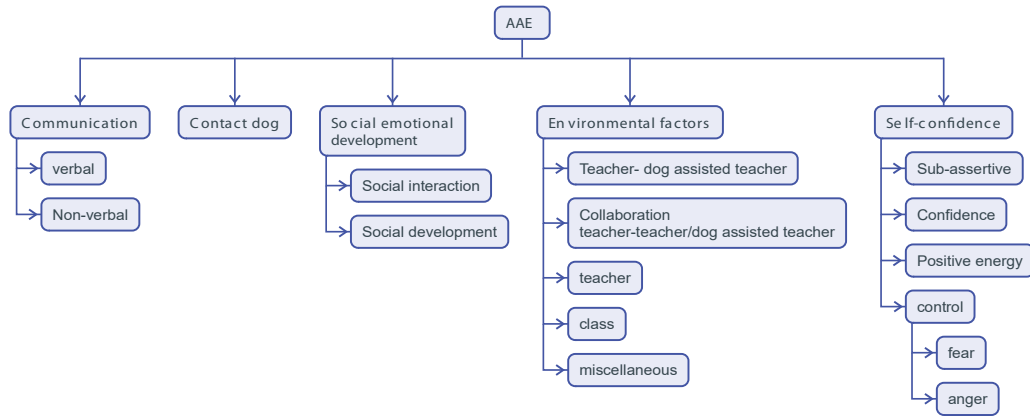


Figure 1: Main codes.

Table 2: Teachers' perception.

	Context of the AAE Sessions	Beyond the Context
Communication	Students communicate better and more transparently. Students can be clearer about what they want and need. Students use more gestures in their communication. Improved posture of sitting upright in the classroom.	Conflict situations are resolved more quickly through improved communication.
Contact with the dog	A dog can reach students faster and through body language and energy. A dog gives unconditional love. A dog listens when the student can confidently and clearly express what they want without aggression or anger. Students enjoyed cuddling with the dog and working together.	Working with a dog is more effective than working with a psychologist. Bringing a photo of the dog to class was appreciated.
Social-emotional development		Students are able to interact with their classmates better and more often; they ask if they can participate in a certain game, invite classmates to play with them, and take other people's feelings and wishes into account. The students have gained more insight into their own emotions, how they express themselves, and their effect on the environment. The children have gained more self-insight about their emotions and their behavior towards the environment. Solution-oriented work is increasing and so there are more pleasant interactions with both classmates and the teacher.
Self-confidence	The students seem to have more self-confidence after following the DOG project.	In general, the pupils dare more than before; they dare to stand up for themselves, think they have more to offer than before and can achieve more. The school results are rising.
Environmental factors	Teachers say that they are not sure if all the positive changes in the students have been caused by the DOG project. The DOG project has a positive influence, but factors, such as interaction with classmates, the development of the pupil, the family situation, and the experiences they gain in their lives, may also influence the way in which the pupil develops.	The dog-assisted teacher knows how to look for the pain points in the students and make them clear so they can work on them. Teachers indicate that they have gained more insight into themselves and have grown professionally.

Table 3: Parents perception.

	Context of the AAE Sessions	Beyond the Context
Communication		Parents especially indicate that they have noticed that their children have started to communicate better, make adequate eye contact more often, and are better able to share their feelings and emotions.
Contact with the dog	The children are used to pets and, therefore, participate more easily in the process. The children appreciate the sessions with the dog because a dog does not immediately start a conversation about difficult things. The children experienced the contact with the dog as pleasant, even though there were sometimes difficult situations.	
Social-emotional development	According to their parents, several children have learned to better control and regulate their emotions through the DOG project. Children are better at recognizing their own emotions.	The children have become better at socializing with their classmates. In the past, children were often outside the group and now they also play with their classmates and are involved in group games. The children dare to show their emotions more and actively ask for help from their peers and teachers if necessary. Children have developed a better relationship with their teachers. Children dare to speak up more and are better able to indicate what they do and do not need so that the teacher can adjust accordingly.
Self-confidence	Children have insight into their own actions and feelings, why they act the way they do, and what effect their own behavior has on others.	In general, children dare to stand up for themselves more. The children have gained more self-insight and more self-confidence.
Environmental factors	The children are at an age at which they are in full development, and environmental factors, such as TV, internet, interaction with peers, family situations, and experiences they gain outside of school, may have played a role in this.	Some parents indicate that they have been able to observe so many changes that they cannot deny the influence of the DOG project but cannot rule out environmental factors either.



student's participation in the DOG project. Her mother notes that she has developed verbally, speaks up more, and is much more assertive. She now makes eye contact when speaking to someone. Another student, who used to be reserved and struggled socially and emotionally, showed significant improvement in her hockey team after participating in the DOG project. Parents express satisfaction with the dog-assisted teacher. One parent mentions that the teacher understood her daughter well, and other parents mention receiving guidance from the teacher to improve their interactions with their children. They also express accepting their children more as they are and adapting better to their needs. The entire DOG project is described by various parents as "light-hearted," "not heavy," "engaging," and "not feeling like therapy."

Teachers highlight communication and interaction with the dog as pivotal elements of the DOG project, enhancing students' understanding of emotions and behavior. Particularly noteworthy is the interpretation of playful interaction, which teachers suggest adds value beyond interventions solely guided by psychologists. These outcomes align with the effects of AAPT [19,20] and underscore the recognized significance of play in students' education and development [34]. Play serves as a crucial aspect for both children and animals, fostering intrinsic motivation and facilitating academic learning across various domains while also enhancing executive functions such as emotional regulation and memory.

The perceived outcomes regarding the participation of dogs in AAE are consistent with previous research [35,36]. The perceptions are in line with theoretical frameworks about AAE [37] and the model of enactive anthrozoology [12]. The contribution of the AAE intervention to students' social-emotional development within a broader context emerges consistently across all interviews.

This AAE, the DOG project, is closely intertwined with various educational facets, including the school environment, classroom dynamics, parental involvement, and teacher-student interactions. Teachers' perceptions seem to indicate the added value of this. It remains unclear to what extent these characteristics differ from trajectories outside the school setting and are, therefore, distinct from their positive impacts. The guidance provided by the dog-assisted teacher is generally perceived positively by both the student and the teacher. Additionally, teachers note that the AAE project has provided them with insights that affect their professional development. These unforeseen impacts present an intriguing opportunity for further research. The researcher did not anticipate this effect. The teachers did not explain how professional growth was brought about by the DOG project.

Both parents and teachers acknowledge the crucial role of the environment in the general development of students, and they indicate that they fully recognize and appreciate the positive influence of the DOG project.

## Limitations

Some limitations of this study should be kept in mind. Only teachers and parents of students who participated in the

program were interviewed. Parents indicated that the children were accustomed to pets. This means that the significance of AAE for students who are not accustomed to pets is unclear at this point. The experiences of parents and teachers inadvertently influenced their response to the questions asked and they attributed them to the influence, the program, and the dog. It is possible for both parents and teachers to interpret student behavior in different ways and from a biased perspective, based on personal values. Nevertheless, there is a significant amount of agreement in the perceptions regarding the significance of the DOG project. The experiences of the students are not included in this research. This raises the question of what they themselves would say about the impact of the DOG program on their development. Based on previous research [23] in which students report experiencing positive effects in the social-emotional field because of the DOG project, it is plausible that interviewing students would lead to similar responses to those expressed by teachers and parents. By interviewing students in further research, it would become feasible to narrow down and focus specifically on the underlying factors that foster this social-emotional development.

## Conclusion

In conclusion, it can be cautiously stated that 10 sessions, according to the DOG project, had a positive impact on the social-emotional development of students with additional support needs, according to their parents and teachers.

Play forms the basis of guided human-animal interventions, as offered in the DOG project. With Dewey and Vygotsky as early proponents, the understanding that children learn through play has a solid foundation in research [38]. To successfully implement playful activities in education, it is essential for schools and systems to focus on how students perceive learning as playful [38]. Programs like the DOG project provide a method of playful learning.

Finally, research on the added knowledge and skills of an AAE professional with a teaching background is recommended, focusing on the implementation and development of this promising field of AAE interventions. Further research is justified to offer insights into AAE's impact on teacher professionalization and the essential qualities of a dog-assisted teacher for fostering positive results. Subsequently, this information can inform training programs for professionals engaged in AAE.

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