How Animals Help Students Learn

Nancy R. Gee, PhD
Professor of Psychology
WALTHAM Human-Animal Interaction Research Manager
Organization and Resources

What will be covered...

• Summarize what we know about how animals help students learn.
  • What works and how?
• The animal side of the equation
• Practical recommendations for safe and effective implementation.
Organization and Resources

Recent Review Papers...

**RESEARCH ARTICLE**

Children Reading to Dogs: A Systematic Review of the Literature

Sophie Susannah Hall¹ *, Nancy R. Gee², Daniel Simon Mills¹

¹ School of Life Sciences, University of Lincoln, Lincoln, United Kingdom, 2 WALTHAM Centre for Pet Nutrition, Waltham on the Wolds, Leicestershire, United Kingdom

**Review**

Companion Animals and Child/Adolescent Development: A Systematic Review of the Evidence

Rebecca Purewal ¹, Robert Christley ³, Katarzyna Kordas ²,³, Carol Joinson ³, Kerstin Meints ¹, Nancy Gee ⁵,⁶ and Carri Westgarth ¹

**Review**

Animal-Assisted Interventions in the Classroom— A Systematic Review

Victoria L. Brelsford ¹, Kerstin Meints ¹,*, Nancy R. Gee ²,³ and Karen Pfeffer ¹

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**Review**

Human–Animal Interaction Research in School Settings: Current Knowledge and Future Directions

Nancy R. Gee
WALTHAM Centre for Pet Nutrition

James A. Griffin
Eunice Kennedy Shriver National Institute of Child Health and Human Development

Peggy McCardle
Haskins Laboratories

Published February 2017

• Current state of the research
• Resource for:
  • Educators
  • Researchers
  • Volunteers
• Recommendations for:
  • Research Design
  • Best Practice
  • Animal Welfare
• Discussion of legal issues
Animals in Classrooms

What does this look like?

- Animals are present at virtually all levels of education:
  - Preschool - Kindergarten:
    - Classroom pets (e.g., fish, guinea pigs)
    - Animal visits and “show and tell”
  - Elementary school & Middle school
    - Science classes – ecology & biology
    - E.g., crayfish/crawdads are used to teach children about habitats, adaptations and methods of scientific inquiry
  - Highschool & university level
    - Biology, Psychology, Anatomy & Physiology Classes
    - Dissection exercises (e.g., earth worms, fetal pigs)
    - Studies of animal behavior (e.g., pigeons, mice, rats)
Animals in Classrooms

Just how common is it?

- Uttley (2013) – reported that 2/3rd of 1,400 of the members of the National Association for the Education of Young Children have animals in their classrooms
- Major surveys in the US and UK in 2015
  - US and Canada – survey by AHA’s Pet Care Trust’s Pets in the Classroom program (1,131 teachers had pets in their classrooms)
  - Majority had pets at home and fish in their classrooms
- Other common classroom pets: amphibians and reptiles, guinea pigs, rats, and insects.
- Animal visitation – AAI/AAT/AAE
- Reading to Dogs programs
- Field trips - aquariums, zoos, aviaries, botanical gardens...
Animals in Classrooms

Just how common is it?

• VERY COMMON!!!
• No system of tracking it
• Underground culture
Anecdote vs legitimate science

Under what circumstances and for whom are animals beneficial?
  • When are they NOT beneficial or contra-indicated

Establishing an evidence base will guide practice/application.

Animal welfare concerns must be addressed.

Legitimizing the practice will require the establishment of standards for practice and animal welfare.

Theory?
Animal-Assisted Education

A Framework for Discussion...

Teacher
Responsible for Animals, Students, and Educational Experience/Goals

Animal
Health/Safety/Species Needs/Recognized Stress Signals

Student
Health/Safety/Educational Needs/Emotional States

AAE

Gee, Fine, & Schuck (2016)
Mooney (2013)

- **Dewey**: espoused the importance of allowing children’s interests to form the basis of curriculum planning
- **Montesorri**: children take and learn responsibility by direct interaction with their environment
- **Erikson**: examined the impact of culture and society on development
- **Piaget**: children construct their own knowledge by interacting with their environment
- **Vygotsky**: children learn by doing and talking about their experiences (language production) and develop aspects of cognition (executive function) as part of these experiences
Animals in Classrooms

Perceived benefits

• Captivates students’ attention  (Zasloff, Hart & DeArmond, 1999)
• Motivation for learning  (Endenburg and Van Lith, 2011)
  • Child emotionally invests in the subject – leads to greater retention of information
  • Learning is optimized when it occurs in the context of a meaningful relationship
• Improves socio-emotional and empathy development  (Daly & Suggs, 2010)
• Provides educationally relevant hands-on experience and enhances psychological well-being  (Rud & Beck, 2003)
Social Competence – plays a critical role in educational success

- Multifaceted concept encompassing:
  - Social adjustment – child is developmentally on target for achieving age appropriate social goals.
    - Based on the expectations of parents, teachers, and society.
  - Social performance - interactive style and the efficiency of that style
    - What situations become problematic for the child?
  - Social skills – specific abilities the child uses within a social situation
    - How does the child respond to a given situation and how does the child encode that information.

Pendry, Carter, & Vandagriff, 2017
Social and Classroom Behaviors

How dogs may impact social competence for elementary students:

• School dog present in one class compared to a no-dog class (Beetz, 2013):
  • Increase in positive attitudes toward school and positive emotions related to learning.
Social and Classroom Behaviors

How dogs may impact social competence for elementary students:

- A dog’s daily presence (over 3 months) resulted in improved empathy compared to a no-dog control condition (Hergovich, et al 2002).
Another study recorded child behavior before and during a two hour/week (1 month) interaction with a dog (Kotrschal & Ortbauer, 2003).

When the dog was present:
- Children were more socially integrated (spent less time alone), paid more attention to their teacher and displayed few behavioral extremes (e.g., aggressive behavior – especially among the boys).
Social and Classroom Behaviors

Social competence and guinea pigs:

• Dr. Maggie O’Haire’s work in this area with typical children and those on the Autism Spectrum.
  • RCT involving guinea pigs – 8 week program
  • Social functioning was enhanced in the guinea pig group compared to a wait-list control group (O’Haire, McKenzie, McCune, & Slaughter, 2013).
Social and Classroom Behaviors

Dogs on university campuses:

• Wildly popular!
  • A review published in 2015 yielded 925 programs in the USA (Crossman & Kazdin, 2015).

• RCT study compared a canine visitation program with wait-list control (Pendy et al., 2017):
  • Students who spent time with the dogs had significantly higher feelings of contentment and lower feelings of anxiety and irritability.
Does the presence of an animal improve attention?

- Children paid more attention to the teacher \( \text{(Kotrschal & Ortbauer, 2003).} \)
- Children with Down Syndrome were more responsive to adults when a dog was present \( \text{(Limond, Bradshaw, & Cormack, 1997).} \)
- RCT using passive infrared hemoencephalography during a test of cognition \( \text{(Hediger & Turner, 2014).} \):
  - Task performance improved when a real dog was present compared to robotic dog.
  - Higher frontal lobe activity when the real dog was present compared to the robotic dog.
My research with preschoolers...

Does the presence of an animal improve cognition?

- Empirical designs
  - Random
  - Assignment to conditions
  - Presentation of stimuli
  - Counterbalancing

- Repeated measures
  - Reduces error variance
  - Multiple data points per subject
  - Small sample sizes

- Medium to large effect sizes

<table>
<thead>
<tr>
<th>Task</th>
<th>Dog Condition relative to No Dog or Stuffed Dog</th>
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<tbody>
<tr>
<td>Execution of Motor-skills</td>
<td>Faster with no loss of accuracy</td>
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<tr>
<td>Following Instructions</td>
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<tr>
<td>Motor-skills</td>
<td>Higher Adherence Instructions</td>
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<tr>
<td>Object Recognition Exp 1</td>
<td>Fewer prompts needed</td>
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<tr>
<td>Object Recognition Exp 2</td>
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<td>Memory</td>
<td></td>
</tr>
<tr>
<td>Object Recognition</td>
<td>Faster and more accurate</td>
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<tr>
<td>Categorization</td>
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<tr>
<td>Match-to-Sample</td>
<td>Fewer irrelevant choices</td>
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<tr>
<td>Match-to-Category</td>
<td>Larger Animation Effect</td>
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<tr>
<td>Language Production</td>
<td></td>
</tr>
<tr>
<td>Story Telling</td>
<td>Greater word production</td>
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Reading to Dogs Programs

What do we know?

Children Reading to Dogs: A Systematic Review of the Literature

Soophie Susannah Hall¹ *, Nancy R. Gee², Daniel Simon Mills¹

1 School of Life Sciences, University of Lincoln, Lincoln, United Kingdom, 2 WALTHAM Centre for Pet Nutrition, Waltham on the Wolds, Leicestershire, United Kingdom

The Effect of an Animal-Assisted Reading Program on the Reading Rate, Accuracy and Comprehension of Grade 3 Students: A Randomized Control Study

Marieanna C. le Roux • Leslie Swartz • Estelle Swart
Students - identified as poor readers

• 102 - 3rd graders – age 7-13 ($M = 8.2$)
  • 27 – read to a dog (volunteer present)
  • 24 – read to an adult
  • 26 – read to a teddy bear (adult present)
• 10 week program (20 min per week)
  • 9 dogs: Golden Retriever (4), Boxer, King Charles Cavalier, Jack Russell cross, Maltese & Weimaraner
• Data were collected:
  • Before program
  • Upon program completion
  • 8-week follow up
• Standardized measure:
  • Neale Analysis of Reading Ability
Group Differences

Reading Accuracy Results
Conclusions from the study?

• Reading to dogs was beneficial for reading rate, accuracy and comprehension.

• Considerations:
  • Applies to poor readers in 3rd grade.
  • Seems to be more effective for boys in that group than girls.
  • Children in the dog group received more free books than kids in the other condition – that may have provided additional motivation beyond the presence of the dog.
Conclusions from the literature review

Hall, Gee, & Mills, 2016

- Dogs may improve wider learning environment for children
  - Increasing/Improving:
    - positive attitudes (evidence by smiling and laughing) during reading practice
    - attitude/motivation/engagement
    - confidence (self-esteem and self-concept)
  - Decreasing:
    - displays of problematic behaviors
    - anxiety (calming effect)
  - Providing social support and companionship
Animals in the Classroom

Possible Mechanisms of Action

HAI Activities
- Classroom pets/visiting animals
- Animal involvement in educational lessons/activities
- Targeted Interventions

Motivation and/or Self-Efficacy (Hot Executive Functions)

Engagement and/or Attention (Cold Executive Functions)

Self-regulation and Stress coping (anxiety reduction)

Social Interaction

Social-emotional development

Learning

Gee, Griffin, & McCardle, 2017
Where does this leave us?

• Very promising results so far!
• More research is needed so that we can make very clear recommendations regarding when, where, how and for whom animals are most beneficial.
Animal-Assisted Education

The animal side of the discussion...

Teacher
Responsible for Animals, Students, and Educational Experience/Goals

Animal
Health/Safety/Species Needs/Recognized Stress Signals

Student
Health/Safety/Educational Needs/Emotional States

AAE

Gee, Fine, & Schuck (2016)
Focus on dogs...
You Are Your Animal’s Best Advocate

• Pet Partners provides incredibly good guidance on this topic.
• Know your animal & watch them carefully!
• Know the signs of stress

Read With Me™

Pet Partners Therapy Animal Program
Special Initiative
Diligent observation is a must!
• This is how dogs MAY react to stress or threat.
• It does not have to happen in this linear (ladder) like manner.
• It can happen incredibly quickly!

“I just looked away for a minute!”
“One minute they were fine and the next…”
“He just loves kids…I’m in shock!”
Dogs and children

Some sobering statistics:

• About 1.5% of general public suffer a dog bite, but in children that number is twice as high.

• Young children suffer the most bites to the head and neck area.
  • Representing 43% of children under 10 in the maxillofacial ward of hospitals.
  • 55% of children bitten by dogs suffer from PTSD.
  • 72-80% of bites are caused by a familiar dog – at home.

• Not all bites are treated in a hospital
  • 50% of 5-12 year old children report having been bitten by a dog

Meints, Gee & Fine (2017)
Dogs and children

Children like...

• To hug and snuggle
• Face to face contact
• To touch and manipulate
Children are not good at recognizing dog signals!

- Young children misinterpret stress, distress and aggressive behavior in dogs.
- Meints and colleagues showed children and adults pictures of dogs displaying stress signals (for summary see Meints, Gee & Fine, 2017).
  - A range of errors across age groups, but particularly striking 50-65% of children saw aggressive dogs as smiling.
Children >3 can learn with training, but they need reminders or they will slip backwards.

The Blue Dog program was developed as a bite prevention program for children under the age of 7.
Animal Assisted Education

Recommendations

• Do a complete risk assessment in advance.
  • From the perspective of all three
    • Student
    • Animal
    • Teacher
• Know your animal
  • Species specific stress signals
• Have a plan
  • Prepare all three (Student, Animal, Teacher)
Animal Assisted Education

Planning

• Advance preparation for all three:
  • Student (appropriate behavior, allergies?)
  • Animal (training, bath, etc...)
  • Teacher (what to expect, what to do?)
• During the interaction
  • Accident? (first-aid kit, emergency procedures, etc...)
  • Doggy care (poop pick up, water, etc...)
  • Be vigilant
• Afterwards
  • Follow up (what went well, what could improve?)
  • Students, teacher, animal status afterwards?
Animal Assisted Education

It’s the simple things...

- Know where to park the car
- How to get into and out of building
- Schedules – how can you avoid encountering a massive number of children heading from one point to another?
- Where you are allowed to exercise your animal.
- What does the teacher want to accomplish?
  - Where is the class in terms of curricula and can you help reinforce the current lesson?
- Introduce yourself to the principal – what are his/her biggest concerns?
Animal Assisted Education

How can I help get a Read with Me program started, where it does not already exist?

STEP 1 -

Read With Me™

Pet Partners Therapy Animal Program
Special Initiative
Approach a school/library teacher/administrator, but go prepared!

Bring a copy of the lit review paper and/or the book I mentioned along with your Pet Partners guidelines.
- Don’t try to sell it – provide information
- Be realistic – don’t over-state what you can deliver
Animal Assisted Education

Step 3 – Do your due-diligence

• Check that you have approval to begin visits and make sure that this approval has been given by the appropriate source.
  • If your contact is a teacher make sure that the school principal is also onboard.

• Be sure that you have a contact person who will serve as your visit supervisor, and that person has been authorized to perform that duty.

• Are parents in the loop?
  • Work with your supervisor to prepare a note to send home to parents to describe the upcoming interactions. Include a picture of your dog and describe some essentials in the note (setting, reason for visits, how children can opt out) including some basic suggestions for preparing children for the upcoming visits.
  • Consider developing a parental consent form and respect that some parents will say “no” – that’s okay, this isn’t a requirement
There are a lot of cautions in this presentation, and we’ve seen research demonstrating a number of ways that animals can help students learn.

I believe that including animals in classrooms involves more than teaching the lesson of the day...

• It is also about teaching students valuable life lessons!
Thank You!
Any Questions?