

**AN INVESTIGATION OF JUNIOR HIGH SCHOOL STUDENTS ETHICAL
PERCEPTION ON ANIMALS USED IN SCIENCE EDUCATION:
SOME FACTORS THAT MIGHT BE INFLUENTIAL**

RESEARCH PAPER

Submitted as Requirement to Obtain Degree of *Sarjana Pendidikan* in
International Program on Science Education (IPSE) Study Program



Arranged by:

Xavierina Dewi Endangsari Adiningsih

1702560

**INTERNATIONAL PROGRAM ON SCIENCE EDUCATION
FACULTY OF MATHEMATICS AND SCIENCE EDUCATION
UNIVERSITAS PENDIDIKAN INDONESIA**

2021

**AN INVESTIGATION OF JUNIOR HIGH SCHOOL STUDENTS ETHICAL
PERCEPTION ON ANIMALS USED IN SCIENCE EDUCATION:
SOME FACTORS THAT MIGHT BE INFLUENTIAL**

Skripsi ini diajukan untuk memenuhi salah satu syarat
memperoleh gelar Sarjana Pendidikan
pada Program Studi International Program on Science Education (IPSE)
Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

Xavierina Dewi Endangsari Adiningsih
Universitas Pendidikan Indonesia
August 2021

Hak cipta dilindungi Undang – Undang
Skripsi ini tidak boleh diperbanyak seluruhnya atau sebagian,
Dengan cetak ulang, difotokopi, atau cara lainnya tanpa izin dari Penulis

APPROVAL SHEET

**AN INVESTIGATION OF JUNIOR HIGH SCHOOL STUDENTS ETHICAL
PERCEPTION ON ANIMALS USED IN SCIENCE EDUCATION:
SOME FACTORS THAT MIGHT BE INFLUENTIAL**

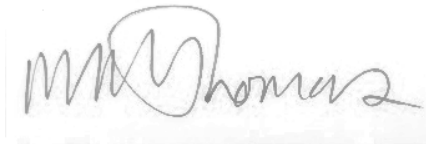
By:

Xavierina Dewi Endangsari Adiningsih

1702560

Approved:

Supervisor I



Mary Margaret Thomas, M. Sc., Ph.D.

Supervisor 2



Ikmanda Nugraha, M.Pd.

NIP. 198804082015041001

Perceived by,

Head of International Program on Science Education Study Program



Dr. Eka Cahya Prima, S.Pd., M. T.

NIP 1990062622024041001

**AN INVESTIGATION OF JUNIOR HIGH SCHOOL STUDENTS ETHICAL
PERCEPTION ON ANIMALS USED IN SCIENCE EDUCATION:
SOME FACTORS THAT MIGHT BE INFLUENTIAL**

Xavierina Dewi Endangsari Adiningsih
International Program on Science Education
xavierinadewi@upi.edu

ABSTRACT

The use of animals in practical classes is a common practice used to illustrate and consolidate concepts in science learning. Indonesia is one of the country that uses of animals for science purposes. The science curriculum in Indonesia has not yet regulated this, so there may be errors in the practice of science with animals. Considering the things mentioned, it is necessary to know how students concern on the ethics of using animals in science education currently. This research aims to profile student ethical perceptions on the use of animals in science learning and some factors that might be influential. This research using a descriptive method with cross-sectional survey design of 41 junior high schools in Bandung. There were 400 students of seventh to ninth-graders who participated in this research. Students ethical perception was investigated by a questionnaire consisting of 25 questions. Results demonstrate that the things that students pay close attention to when it comes to the use of animals in science on the purpose of using animals in science learning, the types of animals used must be appropriate so that they do not cause animal extinction and do not disrupt the existing ecosystem, the ethics of using animals, and the principles that serve as a guideline. The factors of gender and pet ownership did not significantly influence students' ethical perception on the use of animals in science learning.

Keyword: Ethics, Students Perception, Science Learning, Gender, Pet Ownership

INVESTIGASI PERSEPSI ETIKA SISWA SMP TERHADAP HEWAN YANG DIGUNAKAN DALAM PENDIDIKAN ILMU PENGETAHUAN: BEBERAPA FAKTOR YANG MUNGKIN MEMPENGARUHI

Xavierina Dewi Endangsari Adiningsih
International Program on Science Education
xavierinadewi@upi.edu

ABSTRAK

Penggunaan hewan dalam kelas merupakan praktik umum yang digunakan untuk menggambarkan dan mengkonsolidasikan konsep dalam pembelajaran IPA. Indonesia merupakan salah satu negara yang memanfaatkan hewan untuk kepentingan ilmu pengetahuan. Kurikulum IPA di Indonesia belum mengatur hal tersebut, sehingga mungkin terjadi kekeliruan dalam praktik IPA yang melibatkan hewan. Mempertimbangkan hal-hal tersebut, perlu diketahui bagaimana kepedulian siswa terhadap etika penggunaan hewan dalam pendidikan sains saat ini. Penelitian ini bertujuan untuk mengetahui profil persepsi etik mahasiswa tentang pemanfaatan hewan dalam pembelajaran IPA dan beberapa faktor yang mungkin berpengaruh. Penelitian ini menggunakan metode deskriptif dengan rancangan survei *cross sectional* terhadap 41 SMP di Kota Bandung. Ada 400 siswa dari kelas tujuh hingga sembilan yang berpartisipasi dalam penelitian ini. Persepsi etis siswa diselidiki dengan kuesioner yang terdiri dari 25 pertanyaan. Hasil penelitian menunjukkan bahwa hal-hal yang diperhatikan siswa dalam penggunaan hewan dalam IPA pada tujuan penggunaan hewan dalam pembelajaran IPA, jenis hewan yang digunakan harus tepat agar tidak menyebabkan kepunahan hewan dan tidak mengganggu ekosistem yang ada, etika menggunakan hewan, dan prinsip-prinsip yang menjadi pedoman. Faktor jenis kelamin dan kepemilikan hewan peliharaan tidak berpengaruh signifikan terhadap persepsi etika siswa tentang pemanfaatan hewan dalam pembelajaran IPA.

Kata Kunci: Etika, Persepsi Siswa, Pembelajaran IPA, Jenis Kelamin, Kepemilikan Hewan Peliharaan

LIST OF CONTENT

APPROVAL SHEET	ii
DECLARATION	Error! Bookmark not defined.
ACKNOWLEDGEMENTS	Error! Bookmark not defined.
ABSTRACT.....	iii
LIST OF CONTENT	v
LIST OF TABLES	vii
LIST OF FIGURES	x
<u>CHAPTER I</u> INTRODUCTION.....	Error! Bookmark not defined.
1.1 Background	Error! Bookmark not defined.
1.2 Research Problem.....	Error! Bookmark not defined.
1.3 Research Question.....	Error! Bookmark not defined.
1.4 Limitation of Problem	Error! Bookmark not defined.
1.5 Research Objective.....	Error! Bookmark not defined.
1.6 Research Benefit	Error! Bookmark not defined.
1.7 Organizational Structure of Research Paper	Error! Bookmark not defined.
<u>CHAPTER II</u> LITERATURE REVIEW	Error! Bookmark not defined.
2.1 The Issue of Animals Used in Science.....	Error! Bookmark not defined.
2.2 Ethics of Animals Used in Science	Error! Bookmark not defined.
2.3 Student Ethical Perception	Error! Bookmark not defined.
2.4 Student Gender.....	Error! Bookmark not defined.
2.5 Pet Ownership	Error! Bookmark not defined.
2.6 Relevant Research.....	Error! Bookmark not defined.
<u>CHAPTER III</u> RESEARCH METHODOLOGY	Error! Bookmark not defined.
3.1 Research Method.....	Error! Bookmark not defined.
3.2 Research Design.....	Error! Bookmark not defined.
3.3 Population and Sample.....	Error! Bookmark not defined.
3.4 Operational Definition.....	Error! Bookmark not defined.
3.5 Research Instrument.....	Error! Bookmark not defined.
3.6 Research Procedure	Error! Bookmark not defined.
<u>CHAPTER IV</u> RESULT AND DISCUSSION.....	Error! Bookmark not defined.
4.2 Detail of Respondents	Error! Bookmark not defined.
4.3 Students Concern about The Ethical Perception on Use Animals in Science Learning	Error! Bookmark not defined.
4.4 The Effect of Gender on Student Perception	Error! Bookmark not defined.

4.5	The Effect of Pet Ownership on Student Perception.	Error! Bookmark not defined.
4.6	Students Concern About Ethics on The Use of Animals as A Source in Science Learning	Error! Bookmark not defined.
CHAPTER V CONCLUSION, IMPLICATION, AND RECOMMENDATION.....		Error!
Bookmark not defined.		
5.1	Conlusion	Error! Bookmark not defined.
5.2	Implication	Error! Bookmark not defined.
5.3	Recommendation.....	Error! Bookmark not defined.
REFERENCES		ix
APPENDIX A RESEARCH INSTRUMENT		Error! Bookmark not defined.
Appendix A.1	Instrument Judgement.....	Error! Bookmark not defined.
Appendix A.2	Validation and Reliability Result	72
Appendix A.3	Final Version of The Questionnaire	74
APPENDIX B QUESTIONNAIRE ANSWER		78
Appendix B.1	Questionnaire on Google Form.....	79
Appendix B.2	Students Answer Sheet	81

LIST OF TABLES

Table 3. 1 Initial Version of The Questionnaire	23
Table 3. 2 Statements Revision from Expert Judgment.....	28
Table 3. 3 Feedback from University Students on Readability Testing	29
Table 3. 4 Instrument Pilot Testing Detail Respondent.....	30
Table 3. 5 Interpretation Value of Reliability	31
Table 4. 1 Total Respondents.....	Error! Bookmark not defined.
Table 4. 2 Students Responses on The Utilization of Animals in Science Learning.....	Error! Bookmark not defined.
Table 4. 3 Students Responses on The Types of animals used in experiments.	Error! Bookmark not defined.
Table 4. 4 Students Responses on Ethics of Using Animals in Science Learning	Error! Bookmark not defined.
Table 4. 5 Students Responses on The Replacement of Animals in Learning Activities.	Error! Bookmark not defined.
Table 4. 6 Students Responses on ReducingThe Number of Animals Used in Learning Activities.	Error! Bookmark not defined.
Table 4. 7 Result of Chi-Square Test on The First Criteria	Error! Bookmark not defined.
Table 4. 8 Result of Chi-Square Test on The Second Criteria.	Error! Bookmark not defined.
Table 4. 9 Result of Chi-Square Test on The Third Criteria ...	Error! Bookmark not defined.
Table 4. 10 Result of Chi-Square Test on The Fourth Criteria	Error! Bookmark not defined.
Table 4. 11 Result of Chi-Square Test on The Fifth Criteria...	Error! Bookmark not defined.
Table 4. 12 Result of Chi-Square Test on The First Criteria...	Error! Bookmark not defined.
Table 4. 13 Result of Chi-Square Test on The Second Criteria.....	Error! Bookmark not defined.
Table 4. 14 Result of Chi-Square Test on The Third Criteria .	Error! Bookmark not defined.
Table 4. 15 Result of Chi-Square Test on The Fourth Criteria	Error! Bookmark not defined.
Table 4. 16 Result of Chi-Square Test on The Fifth Criteria...	Error! Bookmark not defined.

LIST OF FIGURES

Figure 3. 1 Developing the Questionnaire Processes	22
Figure 4. 1 Appearance of Questionnaire	Error! Bookmark not defined.
Figure 4. 2 Gender Respondents in Detail	Error! Bookmark not defined.
Figure 4. 3 Respondents Pet Ownership in Detail	Error! Bookmark not defined.
Figure 4. 4 Comparison Between Male and Female Response	Error! Bookmark not defined.
Figure 4. 5 Comparison Between Student that Have Pet and Do Not Have Pet.....	Error!
	Bookmark not defined.

REFERENCES

- Agüera, E. I., Sánchez-Hermosín, P., Díz-Pérez, J., Tovar, P., Camacho, R., & Escribano, B. M. (2015). Students integrate knowledge acquisition and practical work in the laboratory. *Advances in Physiology Education*, 39(1), 209–213. doi:10.1152/advan.00019.2015
- Almy, J., Goldsmith, M., & Patronek, G. (2001). Dissection in massachusetts classrooms: correlation of gender, teacher attitudes, and conscientious objection. (*Report*). West Barnstable, MA: Cape Wildlife Center.
- Amahmid, O., Guamri, Y. El, Yazidi, M., Razoki, B., Rassou, K. K., Rakibi, Y., Farouk, I. A., & Charkaoui, F. (2019). Animal use in life sciences education: current status, teachers' and adolescents' attitudes and alternatives. *Anatolian Journal of Education*, 4(2), 69–80. doi:10.29333/aje.2019.428a
- Cheluvappa, R., Scowen, P., & Eri, R. (2017). Ethics of animal research in human disease remediation, its institutional teaching; and alternatives to animal experimentation. *Pharmacology Research and Perspectives*, 5(4), 1–14. doi:10.1002/prp2.332
- Clemence, M., & Leaman, J. (2016). Public attitudes to animal research in 2016. 8059.
- Constable, H. A. (1975). World Medical Association. *British medical journal*, 1(5951), 206.
- Council, F. A. W. (1992). FAWC updates the five freedoms. *Vet. Rec.*, 131, 357.
- Covert, A. M., Whiren, A. P., Keith, J., & Nelson, C. (1985). Pets, early adolescents, and families. *Marriage & Family Review*, 8(3-4), 95-108. doi:10.1300/J002v08n03_08
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Daly, B., & Morton, L. L. (2003). Children with pets do not show higher empathy: a challenge to current views. *Anthrozoös*, 16(4), 298-314.
- Depdiknas. (2007). *Naskah akademik kajian kebijakan kurikulum SMK* [Academic papers for the study of vocational curriculum policy]. *Badan Penelitian Dan Pengembangan Pusat Kirikulum*, 20, 2.
- Dewhurst, D. (2008). Is it possible to meet the learning objectives of undergraduate pharmacology classes with non-animal models ?. *Special Issue*, 14, 207–212.

- Durand, M. de T., Restini, C. B. A., Wolff, A. C. D., Faria Jr., M., Couto, L. B., & Bestetti, R. B. (2019). Students' perception of animal or virtual laboratory in physiology practical classes in pbl medical hybrid curriculum. *Advances in Physiology Education*, 43(4), 451–457. doi:10.1152/advan.00005.2019
- Federer, W. T. (1966). Randomization and Sample Size in Experimentation. *Food and Drug Administration Statistics Seminar*, 1–14.
- Fischer, M. L., & Tamioso, P. R. (2013). Perception and position of animals used in education and experimentation by students and teachers of different academic fields. *Estudos de Biologia*, 35(84), 85–98. doi:10.7213/estud.biol.7846
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education*. New York, America: McGraw-Hill
- Franco, N. H., & Olsson, I. A. S. (2014). Scientists and the 3rs : attitudes to animal use in biomedical research and the effect. *Laboratory Animals*, 48(1), 50-60. doi:10.1177/0023677213498717
- Hagelin, J., Carlsson, H. E., & Hau, J. (2003). An overview of surveys on how people view animal experimentation: some factors that may influence the outcome. *Public Understanding of Science*, 12(1), 67–81. doi:10.1177/0963662503012001247
- Handayani Tyas, E., & Naibaho, L. (2020). Building superior human resources through character education. *EST Engineering & Management*, 83, 11864–11873.
- Hazel, S. J., Signal, T. D., & Taylor, N. (2011). Can teaching veterinary and animal-science students about animal welfare affect their attitude toward animals and human-related empathy?. *Journal of Veterinary Medical Education*, 38(1), 74–83. doi:10.3138/jvme.38.1.74
- Hecht, D. (2014). *Issues of research design and statistical analysis. in studying service-learning* (pp. 121-138). Routledge.
- Herzog, H. A. (2007). Gender Differences In Human-Animal Interactions: A Review. *Anthrozoos*, 20(1), 7–21. doi:10.2752/089279307780216687
- Howell, D. C. (2010). CHI-SQUARE TEST - ANALYSIS OF CONTINGENCY TABLES. 2, 1–4.
- Ismaili, M., Imeri, D., Ismaili, M., & Hamiti, M. (2011). Perceptions of ethics at education in

- university level. *Procedia - Social and Behavioral Sciences*, 15, 1125–1129. doi:10.1016/j.sbspro.2011.03.250
- Kavai, P., Villiers, R. de, & Fraser, W. (2017). Teachers' and learners' inclinations towards animal organ dissection and its use in problem-solving. *International Journal of Instruction*, 10(2), 39–54. doi:10.12973/iji.2017.1023a
- Kavanagh, S., Luxton-reilly, A., Wuensche, B., & Plimmer, B. (2017). A systematic review of Virtual Reality in education. *Themes in Science and Technology Education*, 10(2), 85–119.
- Kellert, S. R., & Berry, J. K. (1987). Attitudes, knowledge, and behaviors toward wildlife as affected by gender. *Wildlife Society Bulletin*, 15(3), 363-371.
- Khashbat, T. (2017). Effect of pet ownership on student ' s stress , self -esteem , self- efficacy and impact on their academic performance. *March*.
- Khoiri, A. (2020). Analisis kritis pendidikan sains di Indonesia: (Problematika, solusi dan model keterpaduan sains dasar) [Critical analysis of science education in indonesia: (Problematics, solutions and basic science integrated models)]. *Jurnal Kajian Pendidikan Sains*, 6(1), 19. doi:10.32699/spektra.v6i1.132
- Knight, S., Vrij, A., Cherryman, J., & Nunkoosing, K. (2004). Attitudes towards animal use and belief in animal mind. *Anthrozoos*, 17(1), 43–62. doi:10.2752/089279304786991945
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.
- Loeb, S., Dynarski, S., McFarland, D., Morris, P., Reardon, S., & Reber, S. (2017). Descriptive analysis in education: A guide for researchers. *National Center for Education Evaluation and Regional Assistance, March*, 1–40. <https://eric.ed.gov/?id=ED573325>
- Macdonald, A. (1981). The pet dog in the home: A study of interactions.
- Machado, G. F., Melo, G. D., Perri, S. H. V., Fernandes, F. V., Moraes, O. C., Souza, M. S., . . . Nunes, C. M. (2017). Perceptions of animal experimentation: a longitudinal survey with veterinary students in Araçatuba, São Paulo, Brazil. *Journal of Biological Education*, 51(4), 391–398. doi:10.1080/00219266.2016.1257501
- Melson, G. F., & Schwarz, R. (1994, October). Pets as social supports for families of young children. In *annual meeting of the Delta Society, New York*.

- Mertler, C. A., & Charles, C. M. (2014). Introduction to action research. Action research: Improving schools and empowering educators.
- Milutinović, J., Arsenijević, L., & Ružić-Zečević, D. (2019). Students' attitudes about the ethics of using animals for experimental purposes. *Scripta Medica*, 50(1), 25–34. doi:10.5937/scriptamed50-20996
- Minarno, E. B. (2010). *Pengantar bioetika dalam perspektif sains dan islam* [Introduction to bioethics in the perspective of science and islam]. Malang, Indonesia: UIN-Maliki Press.
- Miziara, I. D., Magalhães, A. T. de M., d'Aparecida Santos, M., Gomes, É. F., & de Oliveira, R. A. (2012). Research ethics in animal models. *Brazilian Journal of Otorhinolaryngology*, 78(2), 128–131. doi:10.1590/S1808-86942012000200020
- Modell, H. I., Michael, J. A., Adamson, T., Horwitz, B., Harold, I., Michael, J. A., & Adamson, T. (2021). Enhancing active learning in the student laboratory. *Advances in physiology education*, 28(3), 107–111.
- Nerlekar, S., Karia, S., Harshe, D., Warkari, R., & Desousa, A. (2018). Attitude and Knowledge of Undergraduate Medical Students towards the Use of Animals in Medical Research: An Exploratory Study. *Journal of Clinical & Diagnostic Research*, 12(7).
- Oakley, J. (2012). Science teachers and the dissection debate: Perspectives on animal dissection and alternatives. *International Journal of Environmental and Science Education*, 7(2), 253–267. doi:10.1152/advan.00049.2003
- Paul, E., & Serpell, J. (1993). Childhood pet keeping and humane attitudes in young adulthood. *Animal Welfare*, 2(4), 321–337.
- Pifer, L., Shimizu, K., Pifer, R., & Pifer, R. (1994). Public attitudes toward animal research: some international comparisons. *Society and Animals*, 2(2), 95–113. doi:10.1163/156853094X00126
- Prior, H., Casey, W., Kimber, I., Whelan, M., & Sewell, F. (2019). Reflections on the progress towards non-animal methods for acute toxicity testing of chemicals. *Regulatory Toxicology and Pharmacology*, 102, 30–33. doi:10.1016/j.yrtph.2018.12.008
- Ridwan, E. (2013). *Etika pemanfaatan hewan percobaan dalam penelitian kesehatan* [Ethics

- of using experimental animals in health research]. *J Indon Med Assoc*, 63(3), 112-116.
- Rollin, B. E. (2003). Toxicology and new social ethics for animals. *Toxicologic Pathology*, 31(1), 128–131. doi:10.1080/01926230390175011
- Rothgerber, H., & Mican, F. (2014). Childhood pet ownership , attachment to pets , and subsequent meat avoidance. *Appetite*, 79, 11–17. doi:10.1016/j.appet.2014.03.032
- Russell, W. M. S., & Burch, R. L. (1959). *The principles of humane experimental technique*. Methuen, Essex County, Massachusetts, United States of America: Butler and Tanner
- Rustiawan, A., & Vanda, J. (1990). *Pengujian mutu pangan secara biologis* [Biological food quality testing]. *Bogor: Pusat Antar Universitas Pangan dan Gizi Institut Pertanian Bogor*.
- Salomon, A. (1981). Animals and children-the role of the pet. *Canadas Mental Health*, 29(2), 9-13.
- Saxena, A., & Behari, A. (2021). ‘Engaging in an argumentative discourse’- narratives from biology classrooms. *European Journal of Science and Mathematics Education*, 3(1), 14–32. doi:10.30935/scimath/9418
- Signal, T. D., & Taylor, N. (2006). Attitudes to animals : Demographics within a a community sample. *Society & animals*, 14(2), 147–158.
- Špernjak, A., & Šorgo, A. (2017). *Seciranje organov sesalcev v osnovi in srednji šoli ter njihovo mnenje o sekciji v razredu* [Dissection of mammalian organs in primary and secondary school and their opinion on the section in the classroom]. *Center for Educational Policy Studies Journal*, 7(1), 111–130.
- Suriasumantri, J. (1990). *Filsafat ilmu: Sebuah pengantar populer*. Jakarta, Indonesia: Sinar Harapan
- Uchikoshi, A., & Kasai, N. (2019). Survey report on public awareness concerning the use of animals in scientific research in Japan. *Experimental Animals*, 68(3), 307–318. doi:10.1538/expanim.19-0001
- Vallejo, G. et al. (2010) ‘Changes in global gene expression during in vitro decidualization of rat endometrial stromal cells’. *Journal of Cellular Physiology*, 222(1), 127–137. doi: 10.1002/jcp.21929.
- Vehkalahti, K. (2000). Reability of measurement scales tarkkonen’s general method

supersedes cronbach's alpha. In *Social Sciences*.

Wells, D. L., & Hepper, P. G. (1997). Pet ownership and adults' views on the use of animals. *Society & Animals*, 5(1), 45-63.