

## Supplementary Materials:

### Appendix A.

**Table 1.** Step 1 and 2 and by comparison to Somerville and Williams (2015) and Hedefalk et al. (2015) <sup>1</sup>.

Step 1. 20 journals, 59 articles found and read:	Step 2. Grand total of 41 articles from 14 journals included in the review	Somerville and Williams (2015)	Hedefalk et.al. (2015)
<b>Environmental education journals</b>	<b>Environmental education journals</b>		
Environmental Education Research, 6	Environmental Education Research, 6	12	21
Journal of Teacher Education for Sustainability, 3	Journal of Teacher Education for Sustainability, 3	n/a	n/a
Canadian Journal of Environmental Education, 5	Canadian Journal of Environmental Education, 5	2	3
Journal of Education for Sustainable Development, 0			
<b>Early childhood education journals</b>	<b>Early childhood education journals</b>		
International Journal of Early Childhood, 12	International Journal of Early Childhood, 10	11	18
Australasian Journal of Early Childhood, 7	Australasian Journal of Early Childhood, 4	4	4
Contemporary Issues in Early Childhood, 5	Contemporary Issues in Early Childhood, 2	1	3
European Early Childhood Education Research Journal, 4	European Early Childhood Education Research Journal, 2	2	1
International Research in Early Childhood Education Journal (IRECE) 1	International Research in Early Childhood Education Journal (IRECE) 1	n/a	n/a
Journal of Early Childhood Research, 0			
<b>Nordic education journals</b>	<b>Nordic education journals</b>		
Nordisk tidsskrift for pedagogikk og kritikk, 2	Nordisk tidsskrift for pedagogikk og kritikk, 1	n/a	n/a
Utbildning och Demokrati, 2	Utbildning och Demokrati, 1	n/a	1
NorDiNa Nordic Studies in Science Education, 2	NorDiNa Nordic Studies in Science Education, 2	n/a	n/a
Pedagogisk forskning i Sverige, 1	Pedagogisk forskning i Sverige, 1	n/a	0
Norsk pedagogisk tidsskrift, 2	Norsk pedagogisk tidsskrift, 1	n/a	n/a
Tidsskrift for Nordisk Barnehegeforskning, 1			
Scandinavian Journal of Educational			

<sup>1</sup>Although this review did not replicate the reviews conducted by Somerville and Williams (2015) or Hedefalk et al. (2015), we, the authors, had investigated several of the same journals as were investigated in both these reviews. It was, therefore, appropriate to put this review in such a context.

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research, 2  
Journal of Baltic Science Education, 1  
Nordic Studies in Education, 1

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Articles found in journals other than above	Articles found in journals other than above		
Pedagogy, Culture and Society, 2	Pedagogy, Culture and Society, 2	n/a	n/a

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## Appendix B.

### List of 41 articles included in the review.

(Barrett et al. 2017) Barrett, M.J., Matthew Harmin, Bryan Maracle, Molly Patterson, Christina Thomson, Michelle Flowers, and Kirk Bors. 2017. Shifting relations with the more-than-human: six threshold concepts for transformative sustainability learning, *Environmental Education Research* 23: 131–143.

(Boileau and Shaw 2013), Boileau, Elisabeth, and Yvonne Shaw. 2013. Young Voices: The Challenges and Opportunities That Arise in Early Childhood Environmental Education Research. *Canadian Journal of Environmental Education* 18: 142–154.

(Boyd 2016) Boyd, Wendy. 2016. Playing cool: The sustainable Cool Cubby. *Australasian Journal of Early Childhood* 41: 29–37

(Dyment et al. 2014) Dyment, Janet E., Julie M. Davis, Diane Nailon, Sherridan Emery, Seym Getenet, Nadine McCrea, and Allen Hill. 2014. The impact of professional development on early childhood educators' confidence, understanding and knowledge of education for sustainability. *Environmental Education Research* 2: 660–679.

(Engdahl 2015) Engdahl, Ingrid. 2015. Early Childhood Education for Sustainability: The OMEP World Project. *International Journal of Early Childhood* 47:347–366.

(Eriksen 2013) Eriksen, Kristin Gregers. 2013. Why Education for Sustainable Development needs Early Childhood Education. The Case of Norway. *Journal of Teacher Education for Sustainability* 15: 107–120.

(Feriver et al. 2016) Feriver, Şebnem, Gaye (Tuncer) Teksöz, Refika Olgan, Refika, and Alan Reid. 2016. Training early childhood teachers for sustainability: towards a 'learning experience of a different kind' *Environmental Education Research* 22: 717–746.

(Green 2016) Green, Carie. 2016. Monsters or Good Guys: The Mediating Role of Emotions in Transforming a Young Child's Encounter with Nature. *Canadian Journal of Environmental Education* 21: 125–144.

(Green and Somerville 2015) Green, Monica, and Somerville, Margaret. 2015. Sustainability education: researching practice in primary schools. *Environmental Education Research* 21: 832–845.

(Haas and Ashman 2014) Haas, Chris, and Greg Ashman. 2014. Kindergarten children's introduction to sustainability through transformative, experiential nature play. *Australasian Journal of Early Childhood* 39: 21–29.

(Hammond et al. 2015) Hammond, Libby-Lee, Sandra Hesterman, and Marianne Knaus. 2015. What's in Your Refrigerator? Children's Views on Equality, Work, Money and Access to Food. *International Journal of Early Childhood* 47: 367.

(Hedefalk 2015/2006) Hedefalk, Maria. 2015/2016. Barns möjligheter att utveckla en kritisk handlingsförmåga. En studie av meningsskapande i förskolans praktik. *Utbildning & Demokrati* 24: 73–90.

- (Hedefalk et al. 2015) Hedefalk, Maria, Jonas Almqvist, and Leif Östman. 2015. Education for sustainable development in early childhood education: a review of the research literature. *Environmental Education Research* 21: 975–990.
- (Hill et al. 2014) Hill, Allen, Nadine McCrea, Sherridan Emery, Di Nailon, Julie M. Davis, Janet Dymont, and Seyum Getenet. 2014. Exploring how adults who work with young children conceptualise sustainability and describe their practice initiatives. *Australasian Journal of Early Childhood* 39: 14–22.
- (Martinez-Agut et al. 2014) Martinez-Agut, M. Pilar., Ull M. Angeles., and Minguet Pilar Aznar. 2014. Education for sustainable development in early childhood education in Spain. Evolution, trends and proposals. *European Early Childhood Education Research Journal* 22: 213–228.
- (Michiko et al. 2017) Inoue, Michiko, Lyndal O’Gorman, Julie Davis, and Okjong Ji. 2017. An International Comparison of Early Childhood Educators’ Understandings and Practices in Education for Sustainability in Japan, Australia, and Korea. *International Journal of Early Childhood* 49: 353–373.
- (Iskos and Karakosta 2015) Iskos, Eugenia, and Stella Karakosta. 2015. Not Just a Walk in the Park: Case study of a Greek Preschool Located on an Educational Farm. *Canadian Journal of Environmental Education* 20: 46–62.
- (Korkmaz and Guler Yildiz 2017) Korkmaz, Aysel, and Tulin Guler Yildiz. 2017. Assessing pre-schools using the Eco-Schools program in terms of educating for sustainable development in early childhood education. *European Early Childhood Education Research Journal* 25: 595–611.
- (Liefänder et al. 2013) Liefänder, Anne K., Gabriele Fröhlich, Franz X Bogner, and Wesley P. Schultz. 2013. Promoting connectedness with nature through environmental education. *Environmental Education Research* 19: 370–384.
- (Miedema and Bertram-Troost 2015) Miedema, Siebren, and Gerdien Bertram-Troost. 2015. The Challenges of Global Citizenship for Worldview Education. The Perspective of Social Sustainability. *Journal of Teacher Education for Sustainability* 17: 44–52.
- (Millei and Jones 2014) Millei, Zsuzsa, and Alexandra Jones. 2014. The Australian Early Childhood Curriculum and a Cosmopolitan Imaginary. *International Journal of Early Childhood* 46: 63–79.
- (Nugent and Beames 2015) Nugent, Clare, and Simon Beames. 2015. Cultural Transmission at Nature Kindergartens: Foraging as Key Ingredient. *Canadian Journal of Environmental Education* 20: 78–91.
- (Pollock et al. 2017) Pollock, Krista, Jane Warren, and Peter Andersen. 2017. Inspiring environmentally responsible preschool children through the implementation of the National Quality Framework: Uncovering what lies between theory and practice. *Australasian Journal of Early Childhood* 42.
- (Pramling Samuelsson and Park 2017) Pramling Samuelsson, Ingrid, and Eunhye Park. 2017. How to Educate Children for Sustainable Learning and for a Sustainable World. *International Journal of Early Childhood* 49: 273–285.
- (Kimberley and Ferreira 2015) Reis, Kimberley, and Jo-Anne Ferreira. 2015. Community and School Gardens as Spaces for learning Social Resilience. *Canadian Journal of Environmental Education* 20: 63–77.
- (Reunamo and Suomela 2013) Reunamo, Jyrki, and Liisa Suomela. 2013. Education for Sustainable Development in Early Childhood Education in Finland. *Journal of Teacher Education for Sustainability* 15: 91–102.
- (Sageidet 2015) Sageidet, Barbara Maria. 2015. Bærekraftig utvikling i barnehagen – bakgrunn og perspektiver. *Norsk Pedagogisk Tidsskrift* 2: 110–123.

- (Sageidet 2016) Sageidet, Barbara Maria. 2016. Norwegian early childhood teachers' stated use of subject-related activities with children, and their focus on science, technology, environmental issues and sustainability. *NorDiNa. Nordic Studies in Science Education* 12: 121–139.
- (Schmidt 2017) Schmidt, Catarina. 2017. Thrown Together: Incorporating Place and Sustainability into Early Literacy Education. *International Journal of Early Childhood* 49: 165–179.
- (Sjögren 2014) Sjögren, Hanna. 2014. Den politisk-etiska potentialen hos djur-människorelationer i lärarutbildares samtal om hållbar utveckling. *Pedagogisk Forskning i Sverige* 19: 90–109.
- (Sjögren et al. 2015) Sjögren, Hanna, Per Gyberg Per, and Malin Henriksson, Malin. 2015. Human-animal relations beyond the zoo: the quest for a more inclusive sustainability education. *Pedagogy, Culture & Society* 23: 597–615.
- (Margaret and Williams 2015) Somerville, Margaret, and Carolyn Williams. 2015. Sustainability education in early childhood: An updated review of research in the field. *Contemporary Issues in Early Childhood* 16: 102–117.
- (Straume 2016) Straume, Ingerid S. 2016. Norge ligger på dette området langt fremme i forhold til de fleste land: Utdanning for bærekraftig utvikling I Norge og Sverige. *Nordisk tidsskrift for pedagogikk og kritikk*. 2: 78–96.
- (Taylor and Pacini-Ketchabaw 2015) Taylor, Affrica, and Veronica Pacini-Ketchabaw. 2015. Learning with children, ants, and worms in the Anthropocene: towards a common world pedagogy of multispecies vulnerability. *Pedagogy, Culture & Society* 23: 507–529.
- (Twigg et al. 2015) Twigg, Danielle, Donna Pendergast, and Justin Twigg. 2015. Growing global citizens: Young children's lived experiences with the development of their own social world. *International Research in Early Childhood Education* 6: 79.
- (Wals 2017) Wals, Arjen E.J. 2017. Sustainability by Default: Co-creating Care and Relationality Through Early Childhood Education. *International Journal of Early Childhood* 49: 155–164.
- (Weldemariam 2017) Weldemariam, Kassahun, Diane Boyd, Nicky Hirst, Barbara Maria Sageidet, Jamison K. Browder, Leanne Grogan, and Fran Hughes. 2017. A Critical Analysis of Concepts Associated with Sustainability in Early Childhood Curriculum Frameworks Across Five National Contexts. *International Journal of Early Childhood* 49: 333–351.
- (Ärlemalm-Hagsér 2017) Ärlemalm-Hagsér, Eva. 2017. Student Teachers' Workplace-Based Learning in Sweden on Early Childhood Education for Sustainability: Experiences in Practice Settings. *International Journal of Early Childhood* 49: 411–427.
- (Ärlemalm-Hagsér and Davis 2014) Ärlemalm-Hagsér, Eva., and Julie Davis, Julie. 2014. Examining the Rhetoric: a comparison of how sustainability and young children's participation and agency are framed in Australian and Swedish early childhood education curricula. *Contemporary Issues in Early Childhood* 15:231–244
- (Ärlemalm-Hagsér and Elliott 2017) Ärlemalm-Hagsér, Eva, and Sue Elliott. 2017. Editorial: Special Issue: Contemporary Research on Early Childhood Education for Sustainability. *International Journal of Early Childhood* 49: 267–272.
- (Ärlemalm-Hagsér and Sundberg 2016) Ärlemalm-Hagsér, Eva, and Bodil Sundberg. 2016. Naturmöten och källsortering - En kvantitativ studie om lärande för hållbar utveckling i förskolan. *NorDiNa. Nordic Studies in Science Education* 12: 140–156.

## Appendix C.

**Table 2.** Table of articles categorised by methodology.

Literature studies or document analysis (15)	Questionnaires or surveys (5)	Workshops or projects/action projects with teachers or student teachers (3)	Interviews or focus group interviews with teachers or student teachers (6)
Agut et al. (2014)			
Eriksen (2013)			
Hedefalk et al. (2015)			
Miedema & Bertram-Troost (2015)			
Millei & Jones (2014)			
Pramling Samuelsson & Park (2017)			
Reis & Ferreira (2015) <sup>2</sup>	Inoue et al (2017)		Green and Somerville (2015)
Sageidet (2015)	Dyment et al (2014)		Iskos & Karakosta (2015)
Somerville & Williams (2015)	Reunamo & Suomela (2013)	Barrett et al. (2017)	Korkmaz & Guler Yildiz (2017) <sup>3</sup>
Straume (2016)	Sageidet (2016)	Feriver et al. (2016)	Pollock et al. (2017) <sup>4</sup>
Wals (2017)	Ärlemalm-Hagsér & Sundberg (2016)	Hill et al. (2014)	Sjögren (2014)
Weldemariam et al. (2017)			Sjögren et al. (2015)
Ärlemalm-Hagsér & Davis (2014)			
Ärlemalm-Hagsér & Elliott (2017)			
Ärlemalm-Hagsér (2017)			

**Table 3.** Table of articles categorised by methodology (continued).

Case studies/fieldwork with children/mosaic approach (4)	Research conducted with children (12)		
	Photo/video observations with children (2)	Interview and/or dialogue with children (1)	Data from workshops or larger projects or action research projects with children (5)
Boileau (2013)			Engdahl (2015)
Nugent & Beames (2015)	Hedefalk (2015/2016)		Boyd (2016)
Schmidt (2017) <sup>5</sup>	Haas & Ashman (2014) <sup>6</sup>	Twigg et al. (2015)	Green (2016)
Taylor & Pacini-Ketchabaw (2015)			Hammond et al. (2015)
			Liefländer et al. (2013)

<sup>2</sup> Reis & Ferreira's (2015) study included both policy documents and interviews with representatives from various actors and organisations.

<sup>3</sup> Korkmaz & Guler Yildiz's (2017) study included both interviews with teachers as well as observation forms.

<sup>4</sup> Pollock et al.'s (2017) study included both document analysis and interviews with educators.

<sup>5</sup> Schmidt's (2017) case study also included interviews with the children.

<sup>6</sup> Haas & Ashman's study included both a literature review and observations of children's play.