## **Appendix 1: Publications in each type**

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| **Type 1: Designing Learning Environments (n=31)** |
| Alsop, S., Dippo, D., & Zandvliet, D. B. (2007). Teacher education as or for social and ecological transformation: Place-based reflections on local and global participatory methods and collaborative practices. *Journal of Education for Teaching*, *33*(2), 207–223. <https://doi.org/10.1080/02607470701259499>  Bradbery, D. (2013). Bridges to global citizenship: Ecologically sustainable futures utilising children's literature in teacher education. *Australian Journal of Environmental Education*, *29*(2), 221–237. <https://doi.org/10.1017/aee.2014.7>  Burmeister, M., & Eilks, I. (2013). Using participatory action research to develop a course module on education for sustainable development in pre-service chemistry teacher education. *Center for Educational Policy Studies Journal*, *3*(1), 59–78.  Chin, C. K., Munip, H., Miyadera, R., Thoe, N. K., Ch'ng, Y. S., & Promsing, N. (2019). Promoting Education for Sustainable Development in teacher education integrating blended learning and digital tools: An evaluation with exemplary cases. *Eurasia Journal of Mathematics, Science and Technology Education*, *15*(1), em1653. <https://doi.org/10.29333/ejmste/99513>  Elsden-Clifton, J., & Futter-Puati, D. (2015). Creating a health and sustainability nexus in food education: Designing third spaces in teacher education. *Australian Journal of Environmental Education*, *31*(1), 86–98. <https://doi.org/10.1017/aee.2014.44>  Flaws, M. G., & Meredith, K. L. (2007). A wind shift: Integrating curriculum for education for sustainable development. *New Zealand Geographer*, *63*(1), 55–61. <https://doi.org/10.1111/j.1745-7939.2007.00091.x>  Huckle, J. (2012). Teacher education for sustainability in network society: Combining digital and sustainability literacies. *Journal of Teacher Education for Sustainability*, *14*(2), 130–146. <https://doi.org/10.2478/v10099-012-0013-9>  Jegstad, K. M., Sinnes, A. T., & Gjøtterud, S. M. (2018). Science teacher education for sustainable development: from intensions to realisation. *Nordina*, *14*(4), 350–367. <https://doi.org/10.5617/nordina.3263>  Kadji-Beltran, C., Christodoulou, N., Zachariou, A., Lindemann-Matthies, P., Barker, S., & Kadis, C. (2017). An ESD pathway to quality education in the Cyprus primary education context. *Environmental Education Research*, *23*(7), 1015–1031. <https://doi.org/10.1080/13504622.2016.1249459>  Kanga, A. W. (2016). A teaching philosophy: A prerequisite for effective pedagogical practices in teacher education. In *Handbook of Research on Global Issues in Next-Generation Teacher Education* (pp. 123–137). <https://doi.org/10.4018/978-1-4666-9948-9.ch007>  Karpudewan, M., Ismail, Z. H., & Mohamed, N. (2009). The integration of green chemistry experiments with sustainable development concepts in pre-service teachers' curriculum: Experiences from Malaysia. *International Journal of Sustainability in Higher Education*, *10*(2), 118–135. <https://doi.org/10.1108/14676370910945936>  Kennelly, J., & Taylor, N. (2007). Education for Sustainability for the K-6 Curriculum: A Unit of Work for Pre-Service Primary Teachers in NSW. *Australian Journal of Environmental Education*, *23*(2), 3–12. <https://doi.org/10.1017/S0814062600000665>  Kissling, M. T. (2016). Place-Based Social Studies Teacher Education: Learning to Teach for Ecological Citizenship While Investigating Local Waste Issues. In A. R. Crowe & A. Cuenca (Eds.), *Rethinking Social Studies Teacher Education in the Twenty-First Century* (pp. 321–338). Springer. <https://doi.org/10.1007/978-3-319-22939-3_17>  Lindemann‐Matthies, P., Constantinou, C., Junge, X., Köhler, K., Mayer, J., Nagel, U., Raper, G., Schüle, D., & Kadji‐Beltran, C. (2009). The integration of biodiversity education in the initial education of primary school teachers: four comparative case studies from Europe. *Environmental Education Research*, *15*(1), 17–37. <https://doi.org/10.1080/13504620802613496>  Maguire, H., Mc Cloat, A., O'Donoghue, M., & Cusack, M. (2013). Images and objects a tool for teaching education for sustainable development and responsible living in home economics. In D. Doyle, V. Fricke, U. Schrader, & V. W. Thoresen (Eds.), *Enabling Responsible Living* (pp. 133–146). Springer. <https://doi.org/10.1007/978-3-642-22048-7_10>  Makrakis, V. (2017). Unlocking the potentiality and actuality of icts in developing sustainability-justice curricula and society. *Knowledge Cultures*, *5*(2), 103–122. <https://doi.org/10.22381/KC5220177>  Nielsen, W., Andersen, P., Hurley, A., Sabljak, V., Petereit, A.‑L., Hoskin, V., & Hoban, G. (2012). Preparing action competent environmental educators: How hard could it be? *Australian Journal of Environmental Education*, *28*(2), 92–107. <https://doi.org/10.1017/aee.2013.3>  O’Gorman, L. (2014). The Arts and education for sustainability: Shaping student teachers’ identities towards sustainability. In J. Davis & S. Elliott (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (pp. 266–279). Routledge.  O'Brien, C. (2013). Happiness and sustainability together at last! Sustainable happiness. *Canadian Journal of Education*, *36*(4), 228–256.  O'Gorman, L., & Davis, J. (2013). Ecological footprinting: Its potential as a tool for change in preservice teacher education. *Environmental Education Research*, *19*(6), 779–791. <https://doi.org/10.1080/13504622.2012.749979>  Østergaard, E. (2017). Earth at Rest: Aesthetic Experience and Students’ Grounding in Science Education. *Science and Education*, *26*(5), 557–582. <https://doi.org/10.1007/s11191-017-9906-2>  Paige, K., Lloyd, D., & Smith, R. (2016). Pathway to 'Knowing Places' - And Ecojustice - Three Teacher Educators' Experiences. *Australian Journal of Environmental Education*, *32*(3), 260–287. <https://doi.org/10.1017/aee.2016.18>  Rasmussen, K. (2017). The emergence and institutional co-determination of sustainability as a teaching topic in interdisciplinary science teacher education. *Environmental Education Research*, *23*(3), 348–364. <https://doi.org/10.1080/13504622.2016.1182625>  Rodgers, C. R. (2006). "The turning of one's soul" - Learning to teach for social justice: The Putney Graduate School of Teacher Education (1950-1964). *Teachers College Record*, *108*(7), 1266–1295. <https://doi.org/10.1111/j.1467-9620.2006.00693.x>  Shallcross, T., & Wilkinson, G. (1998). The primacy of action: The basis of initial teacher education for sustainability? *Environmental Education and Information*, *17*(3), 243–256.  Smorti, S., Peters-Algie, M., & Rau, C. (2013). Engaging student teachers in sustainable praxis in Aotearoa/New Zealand. *Journal of Teacher Education for Sustainability*, *15*(1), 5–14. <https://doi.org/10.2478/jtes-2013-0001>  Stears, M., & James, A. (2011). Towards socially responsible biology: Two cases in a teacher education programme. *African Journal of Research in Mathematics, Science and Technology Education*, *15*(3), 122–136. <https://doi.org/10.1080/10288457.2011.10740722>  Stevahn, L., & McGuire, M. E. (2017). The plot thickens: Supporting pre-service teachers in authentic use of cooperative learning through the Storypath instructional approach. *Journal of Education for Teaching*, *43*(3), 316–327. <https://doi.org/10.1080/02607476.2017.1321674>  Thaman, K. H. (2010). Teacher capacities for working towards peace and sustainable development. *International Journal of Sustainability in Higher Education*, *11*(4), 353–364. <https://doi.org/10.1108/14676371011077577>  Vare, P., Arro, G., Hamer, A. de, Del Gobbo, G., Vries, G. de, Farioli, F., Kadji-Beltran, C., Kangur, M., Mayer, M., Millican, R., Nijdam, C., Réti, M., & Zachariou, A. (2019). Devising a Competence-Based Training Program for Educators of Sustainable Development: Lessons Learned. *Sustainability*, *11*(7), 1890. <https://doi.org/10.3390/su11071890>  Varga, A., Kószó, M. F., Mayer, M., & Sleurs, W. (2007). Developing teacher competences for education for sustainable development through reflection: The Environment and School Initiatives approach. *Journal of Education for Teaching*, *33*(2), 241–256. <https://doi.org/10.1080/02607470701259564> |
| **Type 2: Understanding Learner Attributes (n=39)** |
| Akça, F. (2019). Sustainable Development in Teacher Education in Terms of Being Solution Oriented and Self-Efficacy. *Sustainability*, *11*(23), 6878. <https://doi.org/10.3390/su11236878>  Alkaher, I., & Goldman, D. (2018). Characterizing the motives and environmental literacy of undergraduate and graduate students who elect environmental programs–a comparison between teaching-oriented and other students. *Environmental Education Research*, *24*(7), 969–999. <https://doi.org/10.1080/13504622.2017.1362372>  Andersson, K. (2017). Starting the pluralistic tradition of teaching? Effects of education for sustainable development (ESD) on pre-service teachers’ views on teaching about sustainable development. *Environmental Education Research*, *23*(3), 436–449. <https://doi.org/10.1080/13504622.2016.1174982>  Andić, D., & Vorkapić, S. T. (2017). Teacher Education for Sustainability: The Awareness and Responsibility for Sustainability Problems. *Journal of Teacher Education for Sustainability*, *19*(2), 121–137. <https://doi.org/10.1515/jtes-2017-0018>  Ärlemalm-Hagsér, E. (2017). Student Teachers’ Workplace-Based Learning in Sweden on Early Childhood Education for Sustainability: Experiences in Practice Settings. *International Journal of Early Childhood*, *49*(3), 411–427. <https://doi.org/10.1007/s13158-017-0201-9>  Buchanan, J., & Griffin, J. (2010). Finding a place for environmental studies: Tertiary institutions as a locus of practice for education for sustainability. *Journal of Teacher Education for Sustainability*, *12*(2), 5–16. <https://doi.org/10.2478/v10099-009-0050-1>  Burmeister, M., Schmidt-Jacob, S., & Eilks, I. (2013). German chemistry teachers' understanding of sustainability and education for sustainable development - An interview case study. *Chemistry Education Research and Practice*, *14*(2), 169–176. <https://doi.org/10.1039/c2rp20137b>  Büssing, A. G., Schleper, M., & Menzel, S. (2019). Emotions and pre-service teachers’ motivation to teach the context of returning wolves. *Environmental Education Research*, *25*(8), 1174–1189. <https://doi.org/10.1080/13504622.2018.1487034>  Cebrián, G., & Junyent, M. (2015). Competencies in education for sustainable development: Exploring the student teachers' views. *Sustainability (Switzerland)*, *7*(3), 2768–2786. <https://doi.org/10.3390/su7032768>  Cebrián, G., Pascual, D., & Moraleda, Á. (2019). Perception of sustainability competencies amongst Spanish pre-service secondary school teachers. *International Journal of Sustainability in Higher Education*, *20*(7), 1171–1190. <https://doi.org/10.1108/IJSHE-10-2018-0168>  Corney, G. (2006). Education for sustainable development: An empirical study of the tensions and challenges faced by geography student teachers. *International Research in Geographical and Environmental Education*, *15*(3), 224–240. <https://doi.org/10.2167/irgee194.0>  Dyment, J. E., & Hill, A. (2015). You mean I have to teach sustainability too? Initial teacher education students' perspectives on the sustainability cross-curriculum priority. *Australian Journal of Teacher Education*, *40*(3), 21–35. <http://dx.doi.org/10.14221/ajte.2014v40n3.2>  Elshof, L. (2005). Teacher's interpretation of sustainable development. *International Journal of Technology and Design Education*, *15*(2), 173–186. <https://doi.org/10.1007/s10798-005-8277-1>  Esa, N. (2010). Environmental knowledge, attitude and practices of student teachers. *International Research in Geographical and Environmental Education*, *19*(1), 39–50. <https://doi.org/10.1080/10382040903545534>  Gedžune, I., & Gedžune, G. (2011). Exploring and promoting ecological consciousness in teacher education: The possibilities of educational action research in education for sustainable development. *Journal of Teacher Education for Sustainability*, *13*(1), 43–61. <https://doi.org/10.2478/v10099-011-0004-2>  Guseva, S., Dombrovskis, V., & Capulis, S. (2015). Unity of affect and intellect for future teachers' education sustainable development. *International Journal of Learning in Higher Education*, *22*(2), 29–35. <https://doi.org/10.18848/2327-7955/CGP/v22i02/48616>  Gwekwerere, Y. (2015). Pre-service teachers' knowledge, participation and perceptions about environmental education in schools. *Australian Journal of Environmental Education*, *30*(2), 198–214. <https://doi.org/10.1017/aee.2015.15>  Kalsoom, Q., Khanam, A., & Quraishi, U. (2017). Sustainability consciousness of pre-service teachers in Pakistan. *International Journal of Sustainability in Higher Education*, *18*(7), 1090–1107. <https://doi.org/10.1108/IJSHE-11-2016-0218>  Kang, W. (2019). Perceived Barriers to Implementing Education for Sustainable Development among Korean Teachers. *Sustainability*, *11*(9), 2532. <https://doi.org/10.3390/su11092532>  Kennelly, J., Taylor, N., & Maxwell, T. (2008). A Student Teacher's Personal Pathway to Education for Sustainability. *Australian Journal of Environmental Education*, *24*(2), 23–33. <https://doi.org/10.1017/S0814062600000550>  Lindemann-Matthies, P., Constantinou, C., Lehnert, H.‑J., Nagel, U., Raper, G., & Kadji-Beltran, C. (2011). Confidence and Perceived Competence of Preservice Teachers to Implement Biodiversity Education in Primary Schools-Four comparative case studies from Europe. *International Journal of Science Education*, *33*(16), 2247–2273. <https://doi.org/10.1080/09500693.2010.547534>  Lummis, G. W., Morris, J. E., Lock, G., & Odgaard, J. (2015). Where Western Australian graduate diploma of education primary students source their information on sustainability. *Australian Journal of Teacher Education*, *40*(10), 51–65. <https://doi.org/10.14221/ajte.2015v40n10.4>  Lummis, G. W., Morris, J. E., Lock, G., & Odgaard, J. (2017). The influence of ecological citizenship and political solidarity on Western Australian student teachers’ perceptions of sustainability issues. *International Research in Geographical and Environmental Education*, *26*(2), 135–149. <https://doi.org/10.1080/10382046.2016.1235359>  Martin, J., & Carter, L. (2015). Preservice teacher agency concerning education for sustainability (EfS): A discursive psychological approach. *Journal of Research in Science Teaching*, *52*(4), 560–573. <https://doi.org/10.1002/tea.21217>  Martínez-Borreguero, G., Maestre-Jiménez, J., Mateos-Núñez, M., & Naranjo-Correa, F. L. (2019). Knowledge Analysis of the Prospective Secondary School Teacher on a Key Concept in Sustainability: Waste. *Sustainability*, *11*(4), 1173. <https://doi.org/10.3390/su11041173>  Nikel, J. (2007). Making sense of education ‘responsibly’: findings from a study of student teachers' understanding(s) of education, sustainable development and Education for Sustainable Development. *Environmental Education Research*, *13*(5), 545–564. <https://doi.org/10.1080/13504620701430778>  Odgers, B. M. (2009). Incorporating education for sustainability into a pre-service elementary school teachers' program. *International Journal of Learning*, *16*(9), 401–418.  Palmberg, I., Berg, I., Jeronen, E., Kärkkäinen, S., Norrgård-Sillanpää, P., Persson, C., Vilkonis, R., & Yli-Panula, E. (2015). Nordic–baltic Student Teachers’ Identification of and Interest in Plant and Animal Species: The Importance of Species Identification and Biodiversity for Sustainable Development. *Journal of Science Teacher Education*, *26*(6), 549–571. <https://doi.org/10.1007/s10972-015-9438-z>  Palmberg, I., Hermans, M., Jeronen, E., Kärkkäinen, S., Persson, C., & Yli-Panula, E. (2018). Nordic Student Teachers’ Views on the Importance of Species and Species Identification. *Journal of Science Teacher Education*, *29*(5), 397–419. <https://doi.org/10.1080/1046560X.2018.1468167>  Panatsa, V. M., & Malandrakis, G. (2018). Student teachers’ perceptions about the social pillar of urban sustainability: Attached importance and believed effectiveness of education. *International Journal of Sustainability in Higher Education*, *19*(5), 998–1018. <https://doi.org/10.1108/IJSHE-09-2017-0162>  Quinn, F., Castéra, J., & Clément, P. (2016). Teachers’ conceptions of the environment: Anthropocentrism, non-anthropocentrism, anthropomorphism and the place of nature. *Environmental Education Research*, *22*(6), 893–917. <https://doi.org/10.1080/13504622.2015.1076767>  Raus, R., & Falkenberg, T. (2014). The journey towards a teacher's ecological self: A case study of a student teacher. *Journal of Teacher Education for Sustainability*, *16*(2), 103–114. <https://doi.org/10.2478/jtes-2014-0014>  Sahin, E., & Alici, S. (2019). An associational study on pre-service early childhood teachers’ nature relatedness in education for sustainability. *International Research in Geographical and Environmental Education*, *28*(4), 343–357. <https://doi.org/10.1080/10382046.2019.1651040>  Salite, I. (2008). Educational action research for sustainability: Constructing a vision for the future in teacher education. *Journal of Teacher Education for Sustainability*, *10*, 5–16. <https://doi.org/10.2478/v10099-009-0021-6>  Summers, M., Childs, A., & Corney, G. (2005). Education for sustainable development in initial teacher training: issues for interdisciplinary collaboration. *Environmental Education Research*, *11*(5), 623–647. <https://doi.org/10.1080/13504620500169841>  Summers, M., Kruger, C., Childs, A., & Mant, J. (2001). Understanding the science of environmental issues: Development of a subject knowledge guide for primary teacher education. *International Journal of Science Education*, *23*(1), 33–53. <https://doi.org/10.1080/09500690116990>  Vongalis-Macrow, A. (2010). Developing pedagogies for teaching about climate change. *International Journal of Learning*, *17*(9), 237–248.  Waldron, F., Ruane, B., Oberman, R., & Morris, S. (2019). Geographical process or global injustice? Contrasting educational perspectives on climate change. *Environmental Education Research*, *25*(6), 895–911. <https://doi.org/10.1080/13504622.2016.1255876>  Yavetz, B., Goldman, D., & Pe'er, S. (2014). How do preservice teachers perceive 'environment' and its relevance to their area of teaching? *Environmental Education Research*, *20*(3), 354–371. <https://doi.org/10.1080/13504622.2013.803038> |
| **Type 3: Measuring Learning Outcomes (n=42)** |
| Alvarez-García, O., Sureda-Negre, J., & Comas-Forgas, R. (2018). Assessing environmental competencies of primary education pre-service teachers in Spain: A comparative study between two universities. *International Journal of Sustainability in Higher Education*, *19*(1), 15–31. <https://doi.org/10.1108/IJSHE-12-2016-0227>  America, C. (2014). Integrating sustainability into business education teacher training. *South African Journal of Education*, *34*(3). <https://doi.org/10.15700/201409161105>  Andersson, K., Jagers, S. C., Lindskog, A., & Martinsson, J. (2013). Learning for the future: Effects of education for sustainable development (ESD) on teacher education students. *Sustainability (Switzerland)*, *5*(12), 5135–5152. <https://doi.org/10.3390/su5125135>  Andić, D., & Vorkapić, S. T. (2014). Interdisciplinary approaches to sustainable development in higher education: A case study from Croatia. In K. D. Thomas & H. E. Muga (Eds.), Handbook of Research on Pedagogical Innovations for Sustainable Development (pp. 67–115). IGI Global. <https://doi.org/10.4018/978-1-4666-5856-1.ch005>  Brandt, J.‑O., Bürgener, L., Barth, M., & Redman, A. (2019). Becoming a competent teacher in education for sustainable development. *International Journal of Sustainability in Higher Education*, *20*(4), 630–653. <https://doi.org/10.1108/IJSHE-10-2018-0183>  Brendel, N., Aksit, F., Aksit, S., & Schrüfer, G. (2016). Multicultural group work on field excursions to promote student teachers’ intercultural competence. *Journal of Geography in Higher Education*, *40*(2), 284–301. <https://doi.org/10.1080/03098265.2016.1140731>  Brinia, V., Psoni, P., & Ntantasiou, E.‑K. (2019). How to Instill Cultural Values in the New Generation through Cultural Promenades and Ancient Drama: A Field Research. *Sustainability*, *11*(6), 1758. <https://doi.org/10.3390/su11061758>  Bürgener, L., & Barth, M. (2018). Sustainability competencies in teacher education: Making teacher education count in everyday school practice. *Journal of Cleaner Production*, *174*, 821–826. <https://doi.org/10.1016/j.jclepro.2017.10.263>  Corney, G., & Reid, A. (2007). Student teachers' learning about subject matter and pedagogy in education for sustainable development. *Environmental Education Research*, *13*(1), 33–54. <https://doi.org/10.1080/13504620601122632>  Elster, D., Müller, N., & Drachenberg, S. (2017). Promotion of system competence based on the syndrome approach in pre-service biology teacher education. In L. Leite, L. Dourado, A. S. Afonso, & S. Morgado (Eds.), *Contextualizing Teaching to Improve Learning: The Case of Science and Geography* (pp. 123–142). Nova Science Publishers.  Esteve-Guirao, P., García, M. J., & Banos-González, I. (2019). The Interdependences between Sustainability and Their Lifestyle That Pre-Service Teachers Establish When Addressing Socio-Ecological Problems. *Sustainability*, *11*(20), 5748. <https://doi.org/10.3390/su11205748>  Feriver, Ş., Teksöz, G., Olgan, R., & Reid, A. (2016). Training early childhood teachers for sustainability: Towards a ‘learning experience of a different kind’. *Environmental Education Research*, *22*(5), 717–746. <https://doi.org/10.1080/13504622.2015.1027883>  Ferreira, J.‑A., Ryan, L., & Davis, J. (2015). Developing Knowledge and Leadership in Pre-Service Teacher Education Systems. *Australian Journal of Environmental Education*, *31*(2), 194–207. <https://doi.org/10.1017/aee.2015.24>  Ferreira, M. E., André, A. C., & Pitarma, R. (2019). Potentialities of Thermography in Ecocentric Education of Children: An Experience on Training of Future Primary Teachers. *Sustainability*, *11*(9), 2668. <https://doi.org/10.3390/su11092668>  Gedžūne, G., & Gedžūne, I. (2015). Pre-service teachers’ aesthetic learning about inclusion and exclusion. *International Journal of Sustainability in Higher Education*, *16*(1), 72–95. <https://doi.org/10.1108/IJSHE-10-2012-0097>  Goldman, D., Yavetz, B., & Pe'er, S. (2014). Student teachers' attainment of environmental literacy in relation to their disciplinary major during undergraduate studies. *International Journal of Environmental and Science Education*, *9*(4), 369–383. <https://doi.org/10.12973/ijese.2014.222a>  Hale, A. E., Shelton, C. C., Richter, J., & Archambault, L. M. (2017). Integrating geoscience and sustainability: Examining socio-techno-ecological relationships within content designed to prepare teachers. *Journal of Geoscience Education*, *65*(2), 101–112. <https://doi.org/10.5408/16-177.1>  Jegstad, K. M., Gjøtterud, S. M., & Sinnes, A. T. (2018). Science teacher education for sustainable development: A case study of a residential field course in a Norwegian pre-service teacher education programme. *Journal of Adventure Education and Outdoor Learning*, *18*(2), 99–114. <https://doi.org/10.1080/14729679.2017.1374192>  Kadji-Beltran, C., Zachariou, A., Liarakou, G., & Flogaitis, E. (2014). Mentoring as a strategy for empowering Education for Sustainable Development in schools. *Professional Development in Education*, *40*(5), 717–739. <https://doi.org/10.1080/19415257.2013.835276>  Kalsoom, Q., & Khanam, A. (2017). Inquiry into sustainability issues by preservice teachers: A pedagogy to enhance sustainability consciousness. *Journal of Cleaner Production*, *164*, 1301–1311. <https://doi.org/10.1016/j.jclepro.2017.07.047>  Karlström, M., & Hamza, K. (2018). Preservice Science Teachers’ Opportunities for Learning Through Reflection When Planning a Microteaching Unit. *Journal of Science Teacher Education.* Advance online publication. <https://doi.org/10.1080/1046560X.2018.1531345>  Kennelly, J., Taylor, N., & Serow, P. (2012). Early career primary teachers and education for sustainability. *International Research in Geographical and Environmental Education*, *21*(2), 139–153. <https://doi.org/10.1080/10382046.2012.672680>  Kostoulas-Makrakis, N. (2010). Developing and applying a critical and transformative model to address education for sustainable development in teacher education. *Journal of Teacher Education for Sustainability*, *12*(2), 17–26. <https://doi.org/10.2478/v10099-009-0051-0>  Lasen, M., Tomas, L., & Hill, A. (2015). 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