IMPLEMENTASI PEMBELAJARAN *SUSTAINABLE WASTE MANAGEMENT PROJECT* TERHADAP *SUSTAINABLE CONSUMPTION* DAN *CREATIVITY PRODUCT* SISWA SEKOLAH DASAR

TESIS

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar
Magister Pendidikan Dasar

oleh

Julia Anis Handayani
NIM 2208443

PROGRAM STUDI MAGISTER PENDIDIKAN DASAR
FAKULTAS ILMU PENDIDIKAN
UNIVERSITAS PENDIDIKAN INDONESIA
2025

IMPLEMENTASI PEMBELAJARAN *SUSTAINABLE WASTE MANAGEMENT PROJECT* TERHADAP *SUSTAINABLE CONSUMPTION* DAN *CREATIVITY PRODUCT* SISWA SEKOLAH DASAR

Oleh
Julia Anis Handayani
NIM 2208443

Sebuah Tesis yang diajukan untuk memenuhi salah syarat memperoleh Gelar Magister Pendidikan pada Program Studi Pendidikan Dasar

Universitas Pendidikan Indonesia
Januari 2025

LEMBAR PENGESAHAN TESIS

JULIA ANIS HANDAYANI

IMPLEMENTASI PEMBELAJARAN *SUSTAINABLE WASTE MANAGEMENT PROJECT* TERHADAP *SUSTAINABLE CONSUMPTION* DAN *CREATIVITY PRODUCT* SISWA SEKOLAH DASAR

disetujui dan disahkan oleh pembimbing,

Pembimbing I,

Prof. Dr. Phil. H. Ari Widodo, Ed.
NIP. 19670527 199203 1 001

Pembimbing II,

Dr. H. Ernawulan Syaodih, M.Pd.
NIP. 19651001 199802 2 001

Mengetahui,
Ketua Program Studi Pendidikan Dasar
Fakultas Ilmu Pendidikan Universitas Pendidikan Indonesia

Dr. Arie Rakhmat Riyadi, M.Pd.
NIP. 19820426 201012 1 005

PERNYATAAN

Dengan ini saya menyatakan bahwa tesis yang berjudul "Implementasi Pembelajaran *Sustainable Waste Management Project* terhadap *Sustainable Consumption* dan *Creativity Product* Siswa Sekolah Dasar" ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan.Atas pernyataan ini, saya siap menanggung resiko/sanksi apabla dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, 09 Januari 2025
Yang membuat pernyataan,

Julia Anis Handayani

KATA PENGANTAR

Bismillahirrahmanirrahim.

Puji dan syukur yang penulis panjatkan kehadirat Allah *Subhanahuwataala*, Dzat Yang Maha Pemurah lagi Maha Penyayang, karena berkat rahmat dan karunia-Nya penulis dapat menyelesaikan tesis dengan judul "Implementasi Pembelajaran *Sustainable Waste Management Project* terhadap *Sustainable Consumption* dan *Creativity Product* Siswa Sekolah Dasar". Shalawat serta salam semoga dilimpahkan kepada Sang Penerang zaman, Muhammad *Shallawllahi 'Aaihi wasalam*. Begitu pula kepada keluarganya, sahabatnya dan kita selaku umatnya hingga akhir zaman. Tesis ini diajukan untuk memenuhi sebagian dari syarat untuk memperoleh gelar Magister Pendidikan pada Program Studi Pendidikan Dasar, Universitas Pendidikan Indonesia. Penulis dapat menyelesaikan tesis ini atas ridho dan pertolongan Allah *Subhanahuwataala*, serta bimbingan dan bantuan dari berbagai pihak yang terlibat. Semoga segala bentuk kebaikan yang telah diberikan dapat menjadi boomerang kebaikan pula. Penulis menyadari tesis ini masih jauh dari kesempurnaan karena terbatasnya kemampuan dan wawasan ilmu pengetahuan yang penulis miliki. Oleh karena itu, kritik dan saran yang membangun terbuka dengan lebar guna perbaikan di masa yang datang. Akhir kata, semoga tesis ini dapat memeberikan kontribusi dalam keilmuan di dunia pendidikan.

Bandung, 09 Januari 2024

Julia Anis Handayani

UCAPAN TERIMA KASIH

Alhamdulillahirabbill 'alaminn…

Segala puji bagi Allah, Tuhan semesta alam atas peluk kasih-Mu yang tiadatara sehingga penulis dapat menyelesaikan tesis. Tiada lupa juga kepada segala pihak yang terlibat di dalamnya dalam penyusunan tesis yang berjudul '*Implementasi Pembelajaran Sustainable Waste Management Project terhadap Sustainable Consumption dan Creativity Product Siswa Sekolah Dasar'* sehingga dapat terselesaikan dengan sebaik-baiknya. Untuk itu dengan penuh kasih saya ucapkan terima kasih kepada:

1. Prof. Dr. Phil. H. Ari Widodo, Ed. selaku dosen pembimbing I, sekaligus dosen pembimbing akademik yang telah meluangkan waktu untuk membimbing dan memberikan arahan serta nasehat sehingga penulis dapat menyelesaikan tesis
2. Dr. Hj. Ernawulan Syaodih, M.Pd. selaku dosen pembimbing II yang telah meluangkan waktu untuk membimbing dan memberikan arahan dan nasehat sehingga penulis dapat menyelesaikan tesis
3. Prof. Dr. Bunyamin Maftuh, M.Pd., M.A. selaku penguji I dan Dr. Sandi Budi Iriawan, M.Pd. selaku penguji II yang telah memberikan saran dan masukkan pada karya tulis ilmiah ini
4. Dr. Arie Rakhmat Riyadi, M.Pd. selaku Ketua Program Studi Pendidikan Dasar Fakultas Ilmu Pendidikan UPI yang telah meluangkan waktu dalam memberikan arahan
5. Bapak dan Ibu dosen Pendidikan Dasar yang telah memberikan keilmuannya selama proses perkuliahan
6. Bapak Kepala SD MTA Karawang dan SDN 01 Duren yang telah membantu dalam proses penelitian
7. Guru kelas yang telah bersedia memberikan bantuan dan informasi selama penelitian serta siswa-siswi kelas V yang telah berpartisipasi
8. Yang selalu penulis banggakan dan cintai, Mamah dan Papah terkasih yang tiada henti menemani dan memberikan dukungan melalui doa, materil dan moral

9. Saudara/i ku tersayang, Ayuk Rani, Ayuk Yaya, Kak Gaga, Teh Ami Dek Doo, Abang Syapril, Mas Rin, Mbak Merry, Mas Cahyo, serta kemenakan yang Imo kasihi, Kakak Abduh, Abang Adan, Kakak Odon, A' Iky, Mbak Icha, Teteh Zena, Kakak Tama, Adek Qia, Adek Azza
10. Rekan bimbingan, Cahyana Gilang Gumelar, Bu Pipih Nurhayati, Pak Suhendar Somawijaya, Bu Anggun Zuhaida, Bu Gita Nurul Puspita dan rekan bimbingan lainnya yang selalu menemani diskusi dan memotivasi
11. Alumni bimbingan, Pak Yohanes Freadyanus Kasi, Kang Ade Yulianto, Zia Nazaliyah Ainisyifa yang selalu menemani diskusi dan memberi dukungan
12. Sahabat penulis yang selalu memberi semangat, afirmasi positif dan dukungan. Sahabat kecilku, Muhammad Agung Ikhsanudin dan Inayah Rohma Oktavia; Sahabat G-4, Tika Maylati, Noeril Asy-Syifa Azzahra, Neneng Nadila Kurniawati; Sahabat Jkt, Anti Tsamrotul Qolby El-Fitri, Syifa Fauziah, Firda Fitria Maulinda, Cahaya Pramudita Riani Putri. Eonie-eoni, Afni Marwatushalihah, Yunisari, Umi Dhakhikoh, Ratih Faradhillah; Sobat Yurika, Mia Komariah, Cahyana Gilang Gumelar, Adib Alfalah, Alamsyah; Sahabat sepeminatan, Cahyana Gilang Gumelar, Moch. Tubagus Ismail, Arie Insany, Iras Rasmiati, Alviani Risti; dan Regha Regita Tiara Rani, Lastri Oktaviani, Budi Rahma Panjaitan
13. Seluruh rekan angkatan Pendidikan Dasar tahun 2022 yang sudah mewarni selama proses perkuliahan
14. Kakak angkatku, Ummul Fadli Harahap yang selalu siap sedia mendengarkan. Orang tua angkatku, Abi dan Alm. Umi Harmen terima kasih atas kasih sayang dan kepercayaannya
15. Seluruh pihak yang telah menginspirasi penulis selama proses penulisan yang tidak dapat penulis uraikan satu persatu.

Harapan dan doa terbaik untuk semua pihak yang terlibat, semoga Tuhan membalas dan memberikan cinta kasih yang lebih dari yang telah diberikan kepada penulis.

Bandung, Januari 2025

Penulis

IMPLEMENTASI PEMBELAJARAN *SUSTAINABLE WASTE MANAGEMENT PROJECT* TERHADAP *SUSTAINABLE CONSUMPTION* DAN *CREATIVITY PRODUCT* SISWA SEKOLAH DASAR

Julia Anis Handayani

2208443

ABSTRAK

Pembelajaran *sustainable waste management project* merupakan program yang diintegrasikan dalam pembelajaran di sekolah dasar untuk mengatasi agar makanan tidak terbuang sesuai dengan SDGs ke-12 *Responsible Consumption and Production*. Tujuan dari penelitian ini adalah untuk mengidentifikasi pengaruh implementasi pembelajaran *sustainable waste management project* terhadap *sustainable consumption* dan *creativity product* siswa sekolah dasar. Penelitian ini menggunakan metodologi penelitian *pra-eksperimen* dengan desain penelitian pada variabel *sustainable consumption* menggunakan desain *one group pretest-posttest design* dan desain penelitian pada variabel *creativity product* menggunakan *one shot case design*. Sampel penelitian terdiri dari 82 siswa kelas 5 yang terdiri dari kelompok sekolah Adiwiyata dan non-Adiwiyata. Instrumen yang digunakan dalam penelitian adalah instrumen angket *sustainable consumption* dan rubrik penilaian *Creativity Product Analysis Matrix* (CPAM). Data *sustainable consumption* diolah dan dianalisis menggunaka uji perbedaan rata-rata *Independent Sample T-Test* dan uji *Wilcoxon,* sedangkan *creativity produk* dinilai dari hasil produk kreatif siswa. Temuan penelitian menunjukkan bahwa pembelajaran *sustainable waste management project* pada sekolah Adiwiyata dan non-Adiwiyata memberikan pengaruh yang signifikan pada *sustainable consumption* dan *creativity product* siswa di sekolah dasar. Dari kedua sekolah tersebut memiliki peningkatan pada hasil *sustainable consumption* dan ketercapaian hasil *creativity product* yang tidak jauh berbeda. Penelitian ini berimplikasi pada keaktifan dan pengalaman belajar siswa serta sebagai alternatif pembelajaran yang dapat digunakan untuk mendukung nilai keberlanjutan.

Kata kunci: *Creativity Product,* Sekolah Adiwiyata, SDGs *Responsible Consumption and Production, Sustainable Consumption, Sustainable Waste Management Project*

IMPLEMENTATION OF SUSTAINABLE WASTE MANAGEMENT PROJECT LEARNING ON SUSTAINABLE CONSUMPTION AND CREATIVITY PRODUCT PRIMARY SCHOOL STUDENT

Julia Anis Handayani

2208443

ABSTRACT

Sustainable waste management project learning is a programme integrated into learning in elementary schools to address food waste in accordance with SDGs 12 Responsible Consumption and Production. The purpose of this study is to identify the effect of sustainable waste management project learning implementation on sustainable consumption and creativity product of elementary school students. This study uses pre-experiment research methodology with research design on sustainable consumption variable using one group pretest-posttest design and research design on creativity product variable using one shot case design. The research sample consisted of 82 grade 5 students consisting of Adiwiyata and non-Adiwiyata school groups. The instruments used in the study were sustainable consumption questionnaire instrument and Creativity Product Analysis Matrix (CPAM) assessment rubric. Sustainable consumption data was processed and analysed using the Independent Sample T-Test mean difference test and Wilcoxon test, while product creativity was assessed from the results of students' creative products. The research findings show that sustainable waste management project learning in Adiwiyata and non-Adiwiyata schools has a significant effect on sustainable consumption and creativity products of students in elementary schools. Of the two schools have an increase in the results of sustainable consumption and the achievement of creativity products. This research has implications for students' activeness and learning experience and as an alternative learning that can be used to support sustainability values.

Key Word: *Creativity Product, Adiwiyata School, SDGs Responsible Consumption and Production, Sustainable Consumption, Sustainable Waste Management Project*

DAFTAR ISI

HALAMAN JUDUL

LEMBAR PENGESAHAN i

LEMBAR PERNYATAAN ii

KATA PENGANTAR iii

UCAPAN TERIMA KASIH iv

ABSTRAK vi

ABSTRACT vii

DAFTAR ISI viii

DAFTAR TABEL xi

DAFTAR GAMBAR xii

DAFTAR LAMPIRAN xiv

BAB I PENDAHULUAN 1

1.1 Latar Belakang Penelitian 1
1.2 Batasan Masalah Penelitian 7
1.3 Rumusan Masalah Penelitian 8
1.4 Tujuan Penelitian 8
1.5 Manfaat Penelitian 9
1.5.1 Manfaat Teoritis 9
1.5.2 Manfaat Praktis 9
1.6 Struktur Organisasi 10

BAB II KAJIAN PUSTAKA 11

2.1 Pembelajaran *Sustainable Waste Management Project* 11
2.2 *Sustainable Consumption* 16
2.2.1 Pengetahuan 18
2.2.2 Perilaku 19

2.2.3 Sosio-emosional 20
2.3 *Creativity Product* 21
2.3.1 Dimensi Kebaruan 22
2.3.2 Dimensi Resolusi 23
2.3.3 Dimensi Elaborasi dan Sintesis 24
2.4 Kerangka Berpikir 25
2.5 Hipotesis Penelitian 25

BAB III METODOLOGI PENELITIAN 28

3.1 Metode dan Desain Penelitian 29
3.2 Populasi dan Sampel 29
3.3 Definisi Operasional 30
3.3.1 Pembelajaran *Sustainable Waste Management Project* 30
3.3.2 *Sustainable Consumption* 30
3.3.3 *Creativity Product* 30
3.4 Instrumen Penelitian 31
3.4.1 Instrumen *Sustainable Consumption* 31
3.4.2 Instrumen *Creativity Product* 35
3.4.3 Instrumen Tambahan 36
3.5 Prosedur Penelitian 36
3.5.1 Tahap Pra-Penelitian 37
3.5.2 Tahap Pelaksanaan Penelitian 38
3.5.3 Tahap Pasca Penelitian 39
3.6 Analisis Data 40
3.6.1 Analisis Data *Sustainable Consumption* 40
3.6.2 Analisis Data *Creativity Product* 44
3.7 Alur Penelitian 45

BAB IV TEMUAN DAN PEMBAHASAN 46

4.1 *Sustainable Consumption* Siswa Sekolah Dasar dalam Pembelajaran *Sustainable Waste Management Project* 46
4.1.1 Pengetahuan *Sustainable Consumption* Siswa dalam Pembelajaran *Sustainable Waste Management Project* 52

4.1.2 Perilaku *Sustainable Consumption* Siswa dalam Pembelajaran *Sustainable Waste Management Project*..... 59
4.1.3 Sosio-emosional *Sustainable Consumption* Siswa Pembelajaran *Sustainable Waste Management Project*..... 68
4.2 *Creativity Product* Siswa Sekolah Dasar dalam Pembelajaran *Sustainable Waste Management Project* 74
4.2.1 Kebaruan *Creativity Product* dalam Pembelajaran *Sustainable Waste Management Project*..... 96
4.2.2 Resolusi *Creativity Product* dalam Pembelajaran *Sustainable Waste Management Project*..... 103
4.2.3 Elaborasi dan Sintesis *Creativity Product* dalam Pembelajaran *Sustainable Waste Management Project*..... 116
BAB V SIMPULAN, IMPLIKASI DAN REKOMENDASI 125
5.1 Simpulan..... 125
5.2 Implikasi..... 126
5.3 Rekomendasi 126
DAFTAR PUSTAKA..... 128
LAMPIRAN..... 150
RIWAYAT HIDUP 246

DAFTAR TABEL

Tabel 2.1 Model Pembelajaran STEM 15
Tabel 3.1 Instrumen Penelitian 31
Tabel 3.2 Kisi-kisi Instrumen *Sustainable Consumption* 32
Tabel 3.3 Hasil Uji Validitas dan Reliabilits Instrumen *Sustainable Consumption* 33
Tabel 3.4 Kisi-kisi Instrumen Rubrik Penilaian Produk Kreatif 35
Tabel 3.5 Kisi-kisi Instrumen Pertanyaan Wawancara 36
Tabel 3.6 Prosedur Pembelajaran *Sustainable Waste Management Project* 38
Tabel 3.7 Hasil Uji Normalitas 41
Tabel 3.8 Hasil Uji Normalitas Tiap Indikator 41
Tabel 3.9 Hasil Uji Homogenitas 42
Tabel 3.10 Hasil Uji Homogenitas Tiap Indikator 42
Tabel 4.1 Hasil Analisis Data *Pretest-Posttest Sustainable Consumption* Siswa 47
Tabel 4.2 Hasil *Pretest-Posttest Sustainable Consumption* Indikator Pengetahuan Siswa 53
Tabel 4.3 Hasil *Pretest-Posttest Sustainable Consumption* Indikator Perilaku Siswa 59
Tabel 4.4 Hasil *Pretest-Posttest Sustainable Consumption* Indikator Sosio-emosional Siswa 68
Tabel 4.5 Hasil Penilaian *Creativity Product* Siswa 76
Tabel 4.6 Hasil Ketercapaian *Creativity Product* Siswa 78
Tabel 4.7 Alternatif Solusi Produk Teknologi 89
Tabel 4.8 Hasil Analisis Dimensi Kebaruan *Creativity Product* 97
Tabel 4.9 Hasil Analisis Resolusi *Creativity Product* Siswa 104
Tabel 4.10 Hasil Analisis Elaborasi dan Sintesis *Creativity Product* 116

DAFTAR GAMBAR

Gambar 1.1 Komposisi sampah SIPSN tahun 2023 2
Gambar 2.1 Kerangka Berpikir 27
Gambar 3.1 Desain Penelitian *Pretest–Posttest One Group Design* 28
Gambar 3.2 Desain Penelitian *One Shot Case Study Design* 29
Gambar 3.3 Alur Penelitian 45
Gambar 4.1 Rata-rata *Pretest-Posttest Sustainable Consumption* 50
Gambar 4.2 Rata-rata *Pretest-Posttest* Indikator Pengetahuan *Sustainable Consumption* 54
Gambar 4.3 Rata-rata *Pretest Posttest* Indikator Pengetahuan *Sustainable Consumption* Berdasarkan Kelompok 56
Gambar 4.4 Rata-rata Indikator Perilaku *Sustainable Consumption* 61
Gambar 4.5 Rata-rata Indikator Perilaku *Sustainable Consumption* Berdasarkan Kelompok 62
Gambar 4.6 Rata-rata Indikator Sosio-emosional *Sustainable Consumption* 69
Gambar 4.7 Rata-rata Indikator Sosio-emosional *Sustainable Consumption* Berdasarkan Kelompok 71
Gambar 4.8 Rata-Rata Ketercapaian *Creativity Product* Siswa 79
Gambar 4.9 Siswa Berdiskusi dalam Kelompok 86
Gambar 4.10 Jawaban Siswa pada LKPD Kegiatan 1 87
Gambar 4.11 Jawaban Siswa pada LKPD Kegiatan 3 90
Gambar 4.12 Produk Teknologi Hasil Kreativitas Siswa Sekolah Adiwiyata 91
Gambar 4.13 Produk Teknologi Hasil Kreativitas Siswa Sekolah non-Adiwiyata 92
Gambar 4.14 Jawaban LKPD Kegiatan 4 93
Gambar 4.15 Jawaban Siswa pada LKPD Kegiatan 5 94
Gambar 4.16 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Orisinil 98
Gambar 4.17 Perbandingan Orisinil Produk di Internet dan Produk Siswa

Sekolah Adiwiyata.....99
Gambar 4.18 Perbandingan Orisinil Produk di Internet dan Produk Siswa Sekolah non-Adiwiyata 99
Gambar 4.19 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Kejutan.....100
Gambar 4.20 Jawaban LKPD Kegiatan 4 102
Gambar 4.21 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Berharga.....105
Gambar 4.22 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Logis 109
Gambar 4.23 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Berguna.....112
Gambar 4.24 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Dapat Dipahami 114
Gambar 4.25 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Lengkap 118
Gambar 4.26 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Elegan 120
Gambar 4.27 Hasil Ketercapaian *Creativity Product* Siswa Pada Komponen Dibuat dengan Baik 122

DAFTAR LAMPIRAN

Lampiran 1. Instrumen Angket *Sustainable Consumption* 150
Lampiran 2. Sintesis Instrumen Angket *Sustainable Consumption*..... 152
Lampiran 3. Hasil Uji Ahli, Validitas dan Reliabilitas Angket *Sustainable Consumption* 158
Lampiran 4. Instrumen Rubrik Penilaian *Creativity Product* 165
Lampiran 5. Instrumen Tambahan (Panduan Wawancara)..... 167
Lampiran 6. Kerangka Pembelajaran *Sustainable Waste Management Project* 168
Lampiran 7. LKPD 169
Lampiran 8. Modul Pembelajaran *Sustainable Waste Management Project* 172
Lampiran 9. Tabulasi Skor dan Rata-rata Nilai Skor Angket *Sustainable Consumption* 193
Lampiran 10. *Output* SPSS Uji Normalitas Angket *Sustainable Consumption*..... 197
Lampiran 11. *Output* SPSS Uji Homogenitas Angket *Sustainable Consumption*..... 205
Lampiran 12. *Output* SPSS Uji Perbedaan Rata-rata Angket *Sustainable Consumption* 207
Lampiran 13. Penilaian *Creativity Product* Siswa..... 209
Lampiran 14. Surat Izin Penelitian 240
Lampiran 15. Surat Balasan Izin Penelitian..... 242
Lampiran 16. Dokumentasi..... 244

DAFTAR PUSTAKA

Abo-Khalil, A. G. (2024). Integrating sustainability into higher education challenges and opportunities for universities worldwide. *Heliyon*, *10*(9), e29946. https://doi.org/10.1016/J.HELIYON.2024.E29946

Acar, S., Burnett, C., Cabra, J. F., Acar, S., Burnett, C., & Cabra, J. F. (2017). Ingredients of Creativity : Originality and More Ingredients of Creativity : Originality and More. *Creativity Research Journal*, *29*(2), 133–144. https://doi.org/10.1080/10400419.2017.1302776

Adhikari, S., Dangi, M. B., Cohen, R. R. H., Dangi, S. J., Rijal, S., Neupane, M., & Ashooh, S. (2024). Solid waste management in rural touristic areas in the Himalaya – A case of Ghandruk, Nepal. *Habitat International*, *143*(December 2023), 102994. https://doi.org/10.1016/j.habitatint.2023.102994

Ahamad, N. R., & Ariffin, M. (2018). Assessment of Knowledge, Attitude and Practice Towards Sustainable Consumption Among University Students in Selangor, Malaysia. *Sustainable Production and Consumption*, *16*(xxxx), 88–98. https://doi.org/10.1016/j.spc.2018.06.006

Ahmad, J., Md. Noor, S., & Ismail, N. (2015). Investigating Students' Environmental Knowledge, Attitude, Practice and Communication. *Asian Social Science*, *11*(16), 284–293. https://doi.org/10.5539/ass.v11n16p284

Al-Nuaimi, S. R., & Al-Ghamdi, S. G. (2022). Sustainable Consumption and Education for Sustainability in Higher Education. *Sustainability (Switzerland)*, *14*(12). https://doi.org/10.3390/su14127255

Amabile, T. M. (2013). *Componential Theory of Creativity* (No. 12–096).

Annunziata, A., Muca, F. L., & Mariani, A. (2022). Preventing Household Food Waste in Italy: A Segmentation of the Population and Suggestions for Action. *Sustainability (Switzerland)*, *14*(12). https://doi.org/10.3390/su14127005

Ardhyantama, V., & Widodo, S. (2020). Creativity Skill Proses in Project Based Learning: A Case Study of Distance Learning in Pacitan. *Randwick International of Education and Linguistics Science Journal*, *1*(2), 152–158. https://doi.org/10.47175/rielsj.v1i2.82

Arlina, Pane, N. E., Sitorus, W., Jerohmi, M. P., & Munazah, A. (2023). Strategi Project Based Learning Sebagai Alternatif Menciptakan Siswa Kreatif. *Jurnal Ilmu Pendidikan*, *3*(2), 117–126.

Baek, S., Shin, H., & Kim, C. J. (2022). Development of a Climate Change SSIBL-STEAM Program Aligned to the National Curriculum for SSI Elementary School in Korea. *Asia-Pacific Science Education*, *8*(1), 109–148. https://doi.org/10.1163/23641177-bja10047

Banerjee, J., Moorthy, V., Kiran, P., Krishna Kishore, S. V., Ekiz, E., & Chatterjee, R. (2023). Visual Encoding of Nudge Influencers and Exploring Their Effect on Sustainable Consumption Among Children. *Cleaner and Responsible Consumption*, *9*(September 2022), 100111. https://doi.org/10.1016/j.clrc.2023.100111

Barone, A. M., Grappi, S., & Romani, S. (2024). Investigating environmentally sustainable consumption: A diary study of home-based consumption behaviors. *Business Strategy and the Environment*, *April*, 1–12. https://doi.org/10.1002/bse.3800

Bathmanathan, V., Rajadurai, J., & Alahakone, R. (2023). What a waste? An Experience in A Secondary School in Malaysia of A Food Waste Management System (FWMS). *Heliyon*, *9*(10), e20327. https://doi.org/10.1016/j.heliyon.2023.e20327

Beghetto, R. A., & Anderson, R. C. (2022). Education Sciences Positive Creativity is Principled Creativity. *Education Sciences*, *12*(184), 1–14. https://www.mdpi.com/journal/education

Bell, G. G. (2021). Making Sustainability Personal: An Experiential Semester-Long Project to Enhance Students' Understanding of Sustainability. *Management Teaching Review*, *6*(1), 7–20. https://doi.org/10.1177/2379298119844975

Beresnevičius, G., & Beresnevičienė, D. (2013). Parameters of The Creative Product and Factors That Determine It. *Economics*, *4*(2), 21–53.

Besemer, S. P. (1984). How Do You Know It's Creative? *G/C/T*, *7*(2), 30–35. https://doi.org/10.1177/107621758400700214

Besemer, S. P. (1998). Creative product analysis matrix: Testing the model structure and a comparison among products - Three novel chairs. *Creativity Research Journal*, *11*(4), 333–346. https://doi.org/10.1207/s15326934crj1104_7

Besemer, S. P., & Treffinger, D. J. (1981). Analysis of Creative Products : Review and Synthesis *. *The Journal of Creative Behavior*, *15*(3).

Biswas, A., & Roy, M. (2015). Green products: An exploratory study on the consumer behaviour in emerging economies of the East. *Journal of Cleaner Production*, *87*(1), 463–468. https://doi.org/10.1016/j.jclepro.2014.09.075

Boons, F., Montalvo, C., Quist, J., & Wagner, M. (2013). Sustainable innovation, business models and economic performance: An overview. *Journal of Cleaner Production*, *45*, 1–8. https://doi.org/10.1016/j.jclepro.2012.08.013

Bramwell-Lalor, S., Ferguson, T., Hordatt Gentles, C., & Roofe, C. (2020). Project-based Learning for Environmental Sustainability Action. *Southern African Journal of Environmental Education*, *36*, 57–72. https://doi.org/10.4314/sajee.v36i1.10

Bronfenbrenner, U. (1994). Ecological Models of Human Development. *Human Growth and Development*, *3*(2), 37–43. https://doi.org/10.4324/9780203730386-13

Burns, H. (2011). Teaching for Transformation: (Re) Designing Sustainability Courses Based on Ecological Principles. *Journal of Sustainability Education*, *2*(3). http://pdxscholar.library.pdx.edu/elp_fac/20/

Caiman, C., Hedefalk, M., & Ottander, C. (2022a). Pre-school teaching for creative processes in education for sustainable development–invisible animal traces, purple hands, and an elk container. *Environmental Education Research*, *28*(3), 457–475. https://doi.org/10.1080/13504622.2021.2012130

Caiman, C., Hedefalk, M., & Ottander, C. (2022b). Pre-School Teaching For Creative Processes In Education For Sustainable Development–Invisible Animal Traces, Purple Hands, And An Elk Container. *Environmental Education Research*, *28*(3), 457–475. https://doi.org/10.1080/13504622.2021.2012130

Carbonell-Carrera, C., Saorin, J. L., Melian-Diaz, D., & de la Torre-Cantero, J. (2019). Enhancing creative thinking in STEM with 3D CAD modelling. *Sustainability (Switzerland)*, *11*(21). https://doi.org/10.3390/su11216036

Chairul, A. R. (2024). Analisis Peran Model Pembelajaran Berbasis Proyek (Project Based Learning) Dalam Meningkatkan Hasil Belajar Dan Kreativitas Siswa Pada. *Borjuis: Journal of Economy*, *2*(3), 63–72.

Challcharoenwattana, A., & Pharino, C. (2015). Co-benefits of household waste recycling for local community's sustainable waste management in Thailand. *Sustainability (Switzerland)*, *7*(6), 7417–7437. https://doi.org/10.3390/su7067417

Charif, S. (2023). Integration of ESD in French primary schools: for what purpose, with what form of integration and with what content? *Environmental Education Research*, *29*(8), 1072–1087. https://doi.org/10.1080/13504622.2022.2104813

Chen, S. Y., & Liu, S. Y. (2020). Developing Students' Action Competence for A Sustainable Future: A Review of Educational Research. *Sustainability (Switzerland)*, *12*(4). https://doi.org/10.3390/su12041374

Cincera, J., Kroufek, R., & Bogner, F. X. (2023). The perceived effect of environmental and sustainability education on environmental literacy of Czech teenagers. *Environmental Education Research*, *29*(9), 1276–1293. https://doi.org/10.1080/13504622.2022.2107618

Claudelin, A., Järvelä, S., Uusitalo, V., Leino, M., & Linnanen, L. (2018). The Economic Potential To Support Sustainability Through Household Consumption Choices. *Sustainability (Switzerland)*, *10*(11). https://doi.org/10.3390/su10113961

Cogut, G., Webster, N. J., Marans, R. W., & Callewaert, J. (2019). Links Between Sustainability-Related Awareness and Behavior: The Moderating Role of Engagement. *International Journal of Sustainability in Higher Education*, *20*(7), 1240–1257. https://doi.org/10.1108/IJSHE-09-2018-0161

Cox, J., Giorgi, S., Sharp, V., Strange, K., Wilson, D. C., & Blakey, N. (2010). Household Waste Prevention - A Review of Evidence. *Waste Management and Research*, *28*(3), 193–219. https://doi.org/10.1177/0734242X10361506

Cremin, T. (2015). Education 3-13: International Journal of Primary, Elementary and Early Years Education Perspectives on Creative pedagogy : Exploring Challenges, Possibilities and Potential. *International Journal of Primary, Elementary and Early Years Education*, *3*(13), 37–41. https://doi.org/10.1080/03004279.2015.1020632

Creswell, J. W., & Creswell, J. D. (2018). Mixed Methods Procedures. In *Research Defign: Qualitative, Quantitative, and Mixed M ethods Approaches* (Fifth Edit). SAGE Publications.

Cutright, T. J., Evans, E., & Brantner, J. S. (2014). Building an Undergraduate STEM Team Using Team-Based Learning Leading to the Production of a Storyboard Appropriate for Elementary Students. *Journal of Science Education and Technology*, *23*(3), 344–354. https://doi.org/10.1007/s10956-013-9467-3

Danilane, L., & Marzano, G. (2014). Consumer Education in Primary School in the Context of Sustainable Development. *Procedia - Social and Behavioral Sciences*, *116*, 1068–1072. https://doi.org/10.1016/j.sbspro.2014.01.347

Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P., & Howe, A. (2013). Creative Learning Environments in Education-A Systematic Literature Review. *Thinking Skills and Creativity*, *8*(1), 80–91.

https://doi.org/10.1016/j.tsc.2012.07.004
Debrah, J. K., Vidal, D. G., & Dinis, M. A. P. (2021). Raising Awareness On Solid Waste Management Through Formal Education For Sustainability: A Developing Countries Evidence Review. *Recycling*, *6*(1), 1–21. https://doi.org/10.3390/recycling6010006
Derdera, S. E., & Ogato, G. S. (2023). Towards Integrated, And Sustainable Municipal Solid Waste Management System In Shashemane City Administration, Ethiopia. *Heliyon*, *9*(11), e21865. https://doi.org/10.1016/j.heliyon.2023.e21865
Dhandra, T. K. (2019). Achieving triple dividend through mindfulness: More sustainable consumption, less unsustainable consumption and more life satisfaction. *Ecological Economics*, *161*(March), 83–90. https://doi.org/10.1016/j.ecolecon.2019.03.021
Di Talia, E., Simeone, M., & Scarpato, D. (2019). Consumer Behaviour Types in Household Food Waste. *Journal of Cleaner Production*, *214*, 166–172. https://doi.org/10.1016/j.jclepro.2018.12.216
Diaz-Ruiz, R., Costa-Font, M., & Gil, J. M. (2017). Moving Ahead From Food-Related Behaviours: An Alternative Approach to Understand Household Food Waste Generation. *Journal of Cleaner Production*, *169*. https://doi.org/10.1016/j.jclepro.2017.10.148
Diego, M., Carlos, G., & Jose, A. (2019). Adaptive Learning Objects in The Context of Eco-Connectivist Communities Using Learning Analytics. *Heliyon*, *5*(11), e02722. https://doi.org/10.1016/j.heliyon.2019.e02722
Dimitrova, T., Ilieva, I., & Angelova, M. (2022). Exploring Factors Affecting Sustainable Consumption Behaviour. *Administrative Sciences*, *12*(4). https://doi.org/10.3390/admsci12040155
Doak, C. K., Jambura, S. M., Knittel, J. A., & Rule, A. C. (2013). Analyzing the Creative Problem-Solving Process: Inventing a Product from a Given Recyclable Item. *Creative Education*, *04*(09), 592–604. https://doi.org/10.4236/ce.2013.49085
Doğan, A., & Kahraman, E. (2021). The Effect of STEM Activities on the Scientific Creativity of Middle School Students. *International Journal of Curriculum and Instruction*, *13*(2), 1241–1266.
Du, C., Abdullah, J. J., Greetham, D., Fu, D., Yu, M., Ren, L., Li, S., & Lu, D. (2018). Valorization Of Food Waste Into Biofertiliser and Its Field Application. *Journal of Cleaner Production*, *187*, 273–284. https://doi.org/10.1016/j.jclepro.2018.03.211
Du, M., Chai, C. S., Di, W., & Wang, X. (2023). What Affects Adolescents' Willingness To Maintain Climate Change Action Participation: An Extended Theory Of Planned Behavior To Explore The Evidence From China. *Journal of Cleaner Production*, *422*(August), 138589. https://doi.org/10.1016/j.jclepro.2023.138589
Ebner, P., McNamara, K., Deering, A., Oliver, H., Rahimi, M., & Faisal, H. (2017). Towards Developing an Industry-Validated Food Technology Curriculum in Afghanistan. *Journal of Agricultural Education*, *58*(3), 72–83. https://doi.org/10.5032/jae.2017.03072
Efendi, N., Barkara, R. S., & Fitria, Y. (2020). Implementasi Karakter Peduli Lingkungan Di Sdn 13 Lolong Belanti Padang. *Jurnal Pendidikan Ilmu Sosial*,

29(2), 155–165. https://doi.org/10.23917/jpis.v29i2.9747
Elliot, G. G., Shahin, W., Garcia-garcia, G., White, R., & Needham, L. (2017). A Methodology for Sustainable Management of Food Waste. *Waste and Biomass Valorization*, *8*(6), 2209–2227. https://doi.org/10.1007/s12649-016-9720-0
Elorinne, A. L., Eronen, L., Pollari, M., Hokkanen, J., Reijonen, H., & Murphy, J. (2020). Investigating Home Economics Teachersí Food Waste Practices and Attitudes. *Journal of Teacher Education for Sustainability*, *22*(1), 6–20. https://doi.org/10.2478/jtes-2020-0002
FAO. (2019). *The State ofFood and Agriculture: Moving Forward On Food Loss And Waste Reduction*. Food and Agriculture Organization of the United Nations.
Farahdiba, A. U., Warmadewanthi, I. D. A. A., Fransiscus, Y., Rosyidah, E., Hermana, J., & Yuniarto, A. (2023). The Present and Proposed Sustainable Food Waste Treatment Technology in Indonesia: A Review. *Environmental Technology and Innovation*, *32*, 103256. https://doi.org/10.1016/j.eti.2023.103256
Fathoni, A. (2020). STEM : Innovation in Vocational Learning. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *17*(1), 33. https://doi.org/10.23887/jptk-undiksha.v17i1.22832
Ferguson, T., Roofe, C., & Cook, L. D. (2021). Teachers' Perspectives On Sustainable Development: The Implications For Education For Sustainable Development. *Environmental Education Research*, *27*(9), 1343–1359. https://doi.org/10.1080/13504622.2021.1921113
Firmansyah, H., Roshayanti, F., & Untari, M. F. A. (2023). Profil Kreativitas Peserta Didik Kelas 3 Sdn Rejosari 01 Pada Proyek Pembuatan Kincir Angin Sederhana. *Didaktik : Jurnal Ilmiah PGSD STKIP Subang*, *9*(2), 4754–4766. https://doi.org/10.36989/didaktik.v9i2.1172
Fraenkel, J. N., Wallen, N. E., & Hyun, H. H. (1932). *How to Design and Evaluate Research and Education* (8th ed.). Mc Graw Hill.
Garnett, T. (2011). Where are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? *Food Policy*, *36*(SUPPL. 1), S23–S32. https://doi.org/10.1016/j.foodpol.2010.10.010
Gasper, D., Shah, A., & Tankha, S. (2019). The Framing of Sustainable Consumption and Production in SDG 12. *Global Policy*, *10*(January), 83–95. https://doi.org/10.1111/1758-5899.12592
Gill, L. J., Ramsey, P. L., & Leberman, S. I. (2015). A Systems Approach to Developing Emotional Intelligence Using the Self-awareness Engine of Growth Model. *Systemic Practice and Action Research*, *28*(6), 575–594. https://doi.org/10.1007/s11213-015-9345-4
Glaviyc, P. (2021). Evolution and current challenges of sustainable consumption and production. *Sustainability (Switzerland)*, *13*(16). https://doi.org/10.3390/su13169379
Göbel, C., Langen, N., & Waskow, F. (2015). The effectiveness of advice and actionsinreducing food waste. *Proceedings of Institution of Civil Engineers: Waste and Resource Management*, *168*(2), 72–86. https://doi.org/10.1680/warm.13.00036
Grace, K., & Lou, M. (2015). Surprise and Reformulation as Meta-Cognitive Processes in Creative Design. *Proceedings of the Third Annual Conference on*

Advances in Cognitive Systems, *8*, 1–17.
Gruijters, R. J., Raabe, I. J., & Hu, N. (2024). *Socio-emotional Skills and the Socioeconomic Achievement Gap*. https://doi.org/10.1177/00380407231216424
Grunert, K. G., Wills, J. M., & Fernández-Celemín, L. (2010). Nutrition Knowledge, And Use And Understanding of Nutrition Information On Food Labels Among Consumers In The UK. *Appetite*, *55*(2), 177–189. https://doi.org/10.1016/j.appet.2010.05.045
Günter, T., Akkuzu, N., & Alpat, Ş. (2017). Understanding 'Green Chemistry' and 'Sustainability': An Example of Problem-Based Learning (PBL). *Research in Science and Technological Education*, *35*(4), 500–520. https://doi.org/10.1080/02635143.2017.1353964
Gurteen, D. (1998). Knowledge , Creativity and Innovation. *Joural Knowledge Management*, *2*(1), 5–13.
Hakim, H. (2017). Pengaruh Interaksi Guru-Siswa Terhadap Kreativitas Peserta Didik SD Negeri 2 Pakis-Banyuwangi. *JPPKn (Jurnal Ilmiah Pendidikan Pancasila Dan Kewarganegaraan)*, *1*(2). https://ejournal.unibabwi.ac.id/index.php/jppkn/article/view/82
Hammami, M. B. A., Mohammed, E. Q., Hashem, A. M., Al-Khafaji, M. A., Alqahtani, F., Alzaabi, S., & Dash, N. (2017). Survey On Awareness And Attitudes Of Secondary School Students Regarding Plastic Pollution: Implications For Environmental Education And Public Health In Sharjah City, UAE. *Environmental Science and Pollution Research*, *24*(25), 20626–20633. https://doi.org/10.1007/s11356-017-9625-x
Hanif, S., Wijaya, A. F. C., & Winarno, N. (2019). Enhancing Students' Creativity through STEM Project-Based Learning. *Journal of Science Learning*, *2*(2), 50. https://doi.org/10.17509/jsl.v2i2.13271
Haqiqi, B. Y. (2023). *Pengaruh Pembelajaran Proyek Waste to Energy terhadap Kesadaran dan Aksi Siswa untuk Memanfaatkan Sampah sebagai Sumber Energi Ramah Lingkungan*. Universitas Pendidikan Indonesia.
Hassan, A., Noordin, T. A., & Sulaiman, S. (2010). The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students. *Procedia - Social and Behavioral Sciences*, *2*(2), 1276–1280. https://doi.org/10.1016/j.sbspro.2010.03.187
Hebrok, M., & Boks, C. (2017). Household Food Waste : Drivers and Potential Intervention Points For Design – An Extensive Review. *Journal of Cleaner Production*, *151*, 380–392.
Hendrizal, Yanti, N., Yuliana, R., Yatma, A., & Malta, T. (2024). Pengembangan Profesionalisme Guru Sekolah Dasar Melalui Kelompok Kerja Guru (KKG). *Didaktik : Jurnal Ilmiah PGSD FKIP Universitas Mandiri*, *10*(1), 179–188.
Henriksson, A. C. (2023). Primary school students' perceptions of a sustainable future in the context of a Storyline project. *Lumat*, *11*(1), 69–90. https://doi.org/10.31129/LUMAT.11.1.1879
Hensley, N. (2020). Educating for Sustainable Development: Cultivating Creativity Through Mindfulness. *Journal of Cleaner Production*, *243*. https://doi.org/10.1016/j.jclepro.2019.118542
Hirpe, L., & Yeom, C. (2021). Municipal Solid Waste Management Policies, Practices, and Challenges In Ethiopia: A Systematic Review. *Sustainability*

(Switzerland), *13*(20). https://doi.org/10.3390/su132011241

Hoang, N. H., & Fogarassy, C. (2020). Sustainability evaluation of municipal solid waste management system for hanoi (Vietnam)-why to choose the "waste-to-energy" concept. *Sustainability (Switzerland)*, *12*(3), 1–20. https://doi.org/10.3390/su12031085

Horn, D., & Salvendy, G. (2016). Product Creativity: Conceptual Model, Measurement and Characteristics. *Theoretical Issues in Ergonomics Science*, *November*. https://doi.org/10.1080/14639220500078195

Iswari, R. D., & Utomo, S. W. (2017). Evaluasi Penerapan Program Adiwiyata Untuk Membentuk Perilaku Peduli Lingkungan di Kalangan Siswa (Kasus: SMA Negeri 9 Tangerang Selatan dan MA Negeri 1 Serpong). *Jurnal Ilmu Lingkungan*, *15*(1), 35. https://doi.org/10.14710/JIL.15.1.35-41

J. Padilla, A., & Trujillo, J. C. (2018). Waste disposal and households' heterogeneity. Identifying factors shaping attitudes towards source-separated recycling in Bogotá, Colombia. *Waste Management*, *74*(2017), 16–33. https://doi.org/10.1016/j.wasman.2017.11.052

Jafer, Y. J. (2020). Assessing Kuwaiti Pre-service Science Teachers' Greenhouse Effect Perceptions and Misconceptions. *International Journal of Science and Mathematics Education*, *18*(4), 657–667. https://doi.org/10.1007/s10763-019-09992-1

Jena, B. N., Saily, A. S., Nanda, S. P., Madhusmita, P. M., & Swain, D. S. (2022). Development of Dehydrator for Domestic Use of Fruits. *International Journal for Research in Applied Science and Engineering Technology*, *10*(5), 3037–3043. https://doi.org/10.22214/ijraset.2022.42885

Julina, J. (2013). Determinan perilaku pembelian ekologis dan konsekuensinya terhadap lingkungan: Perspektif konsumen di Kota Pekanbaru berdasarkan kolektivisme, perhatian terhadap lingkungan, efektivitas konsumen, dan kesediaan membayar. *Kutubkhanah Jurnal Penelitian Sosial Keagamaan*, *16*(2), 115–126.

Kadir. (2015). *Statistika Terapan*. RajaGrafindo Persada.

Karwowski, M., Gralewski, J., Patston, T., Cropley, D. H., & Kaufman, J. C. (2020). The Creative Student in The Eyes of A Teacher: A Cross-Cultural Study. *Thinking Skills and Creativity*, *35*(February), 100636. https://doi.org/10.1016/j.tsc.2020.100636

Karwowski, M., Zielińska, A., & Jankowska, D. M. (2022). Democratizing Creativity by Enhancing Imagery and Agency: A Review and Meta-Analysis. *Review of Research in Education*, *46*(1), 229–263. https://doi.org/10.3102/0091732X221084337

Kattiyapornpong, U., & Ditta-apichai, M. (2023). Sustainable Food Waste Management Practices : Perspectives from Five-Star Hotels in Thailand. *Sustainability*, *12*, 1–19.

Kawasaki, Y., Nagao-Sato, S., Shimpo, M., Fujisaki, K., Yoshi, E., Bohnke, J., Akamatsu, R., & Waschburger, P. (2024). Understanding sustainable dietary behaviors in Japanese and German adults: A cross-cultural comparison. *Resources, Conservation and Recycling*, *201*(2).

Kharkhurin, A. V. (2016). Creativity . 4in1 : Four-Criterion Construct of Creativity. *Creativity Research Journal*, *26*(3), 338–352. https://doi.org/10.1080/10400419.2014.929424

KLHK. (2023). *Sistem Informasi Pengelolaan Sampah Nasional*. https://sipsn.menlhk.go.id/sipsn/public/data/komposisi

Kosseva, M. R. (2013). Introduction: Causes and challenges of food wastage. *Food Industry Wastes*. https://doi.org/10.1016/B978-0-12-391921-2.00019-6

Kwakye, S. O., Amuah, E. E. Y., Ankoma, K. A., Agyemang, E. B., & Owusu, B. G. (2024). Understanding The Performance And Challenges Of Solid Waste Management In An Emerging Megacity: Insights From The Developing World. *Environmental Challenges*, *14*(October 2023), 100805. https://doi.org/10.1016/j.envc.2023.100805

Lazell, J. (2016). Perceived Trustworthiness of Online Shops. *Journal of Consumer Behaviour*, *50*(October), 35–50. https://doi.org/10.1002/cb

Leal Filho, W., Ribeiro, P. C. C., Setti, A. F. F., Azam, F. M. S., Abubakar, I. R., Castillo-Apraiz, J., Tamayo, U., Özuyar, P. G., Frizzo, K., & Borsari, B. (2023). Toward Food Waste Reduction at Universities. *Environment, Development and Sustainability*, *26*(5), 16585–16606. https://doi.org/10.1007/s10668-023-03300-2

Leiva-Brondo, M., Lajara-Camilleri, N., Vidal-Meló, A., Atarés, A., & Lull, C. (2022). Spanish University Students' Awareness and Perception of Sustainable Development Goals and Sustainability Literacy. *Sustainability (Switzerland)*, *14*(8), 1–26. https://doi.org/10.3390/su14084552

Løkke, S., Nielsen, H. N., & Holgaard, J. E. (2023). Problem-Based Learning Approach Facilitating Sustainable Waste Management. *Journal of Problem Based Learning in Higher Education*, *11*(3), 119–129. https://doi.org/10.54337/ojs.jpblhe.v11i3.7828

Lu, C. C. (2017). Interactive Effects of Environmental Experience and Innovative Cognitive Style On Student Creativity in Product Design. *International Journal of Technology and Design Education*, *27*(4), 577–594. https://doi.org/10.1007/s10798-016-9368-x

Lubowiecki-Vikuk, A., Dąbrowska, A., & Machnik, A. (2021). Responsible Consumer and Lifestyle: Sustainability Insights. *Sustainable Production and Consumption*, *25*, 91–101. https://doi.org/10.1016/j.spc.2020.08.007

Maalouf, A., & Mavropoulos, A. (2023). Re-assessing global municipal solid waste generation. *Waste Management and Research*, *41*(4), 936–947. https://doi.org/10.1177/0734242X221074116

Majdi, M. (2020). Program Sekolah Adiwiyata dalam Pengembangan Sosio-Emosional Anak Usia Dasar di SDN Ngupasan Yogyakarta. *Al-Adzka: Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, *9*(2), 85. https://doi.org/10.18592/aladzkapgmi.v9i2.3246

Martín-Sánchez, A., González-Gómez, D., & Jeong, J. S. (2022). Service Learning as an Education for Sustainable Development (ESD) Teaching Strategy: Design, Implementation, and Evaluation in a STEM University Course. *Sustainability (Switzerland)*, *14*(12). https://doi.org/10.3390/su14126965

Mel Rhodes. (1961). Analysis of Creativity Can It Be Taught ? *The Phi Delta Kappan*, *42*(7), 305–310.

Mohd Suki, N. (2016). Consumer environmental concern and green product purchase in Malaysia: structural effects of consumption values. *Journal of Cleaner Production*, *132*(October 2015), 204–214. https://doi.org/10.1016/j.jclepro.2015.09.087

Moon, D. (2024). Promoting Sustainable Practices: Exploring Secondhand Clothing Consumption Patterns and Reductions in Greenhouse Gas Emissions in Japan. *Sustainable Production and Consumption*, *45*(September 2023), 294–305. https://doi.org/10.1016/j.spc.2024.01.007

Nabilla, S., & Desmon, D. (2022). PENGARUH LINGKUNGAN TERHADAP PERKEMBANGAN ANAK Shintya Nabilla[1], David Desmon[2]. *Zona Psikologi*, *4*(3), 66–73.

Nguyen, T. P. L., Nguyen, T. H., & Tran, T. K. (2020). STEM Education in Secondary Schools: Teachers' Perspective Towards Sustainable Development. *Sustainability (Switzerland)*, *12*(21), 1–16. https://doi.org/10.3390/su12218865

Nguyen, T., van den Berg, M., & Nguyen, M. (2023). Food Waste In Primary Schools: Evidence from Peri-Urban Viet Nam. *Appetite*, *183*(January), 106485. https://doi.org/10.1016/j.appet.2023.106485

Nuangchalerm, P., Polyiem, T., & Prachagool, V. (2024). Investigating Environmentally Responsible and Sustainable Development of Pre-service Teachers. *Higher Education Studies*, *14*(1), 89. https://doi.org/10.5539/hes.v14n1p89

Nusantara, C. (2017). Peran Media Sosial Untuk Peningkatan Kreativitas. *Jurnal Kewarganegaraan*, *1*(2), 37–40.

Oliveira, A. W., Brown, A. O., Zhang, W. S., LeBrun, P., Eaton, L., & Yemen, S. (2021). Fostering creativity in science learning: The potential of open-ended student drawing. *Teaching and Teacher Education*, *105*, 103416. https://doi.org/10.1016/j.tate.2021.103416

Olsson, D., & Gericke, N. (2016). The adolescent dip in students' sustainability consciousness - Implications for education for sustainable development. *Journal of Environmental Education*, *47*(1), 35–51. https://doi.org/10.1080/00958964.2015.1075464

Osunji, O. (2021). Relationship between Consciousness about Environmental Education Concepts in Secondary School Chemistry Curriculum and Attitude of Students toward the Environment in Kwara State. *Science Education International*, *32*(1), 80–84. https://doi.org/10.33828/sei.v32.i1.9

Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, *47*(September), 88–94. https://doi.org/10.1016/j.gloenvcha.2017.09.009

Ozanne, L. K., Ballantine, P. W., & McMaster, A. (2022). Understanding Food Waste Produced by University Students: A Social Practice Approach. *Sustainability (Switzerland)*, *14*(17). https://doi.org/10.3390/su141710653

Panatsa, V. M., & Malandrakis, G. (2024). Greek Primary School Students' Moral Judgments and Motives About Sustainable Food Consumption. *Cleaner and Responsible Consumption*, *12*(September 2023), 100173. https://doi.org/10.1016/j.clrc.2024.100173

Papargyropoulou, E., Lozano, R., K. Steinberger, J., Wright, N., & Ujang, Z. Bin. (2014). The food waste hierarchy as a framework for the management of food surplus and food waste. *Journal of Cleaner Production*, *76*, 106–115. https://doi.org/10.1016/j.jclepro.2014.04.020

Parinduri, M. A., Fatimah, N., & Auliya, W. (2023). Implementasi Education

Sustainable Development Pada Lembaga Pendidikan. *At-Tazakki*, *7*(2), 222–236.
Pateman, R. M., de Bruin, A., Piirsalu, E., Reynolds, C., Stokeld, E., & West, S. E. (2020). Citizen Science for Quantifying and Reducing Food Loss and Food Waste. *Frontiers in Sustainable Food Systems*, *4*(December). https://doi.org/10.3389/fsufs.2020.589089
Paujana, W. Y., Megawati, B., & Syawaluddin, F. A. (2024). Pengaruh Interaksi Guru Terhadap Kreativitas Belajar Peserta Didik Kelas X TKJ I Di SMK Swasta Siti Banun Sigambal. *Jurnal Kajian Agama Dan Dakwah*, *4*(2), 361–366.
Paulus, P. B., Dzindolet, M., & Kohn, N. W. (2012). Collaborative Creativity—Group Creativity and Team Innovation. In *Handbook of Organizational Creativity*. https://doi.org/10.1016/B978-0-12-374714-3.00014-8
Perrault, E. K., & Albert, C. A. (2018). Utilizing Project-Based Learning to Increase Sustainability Attitudes Among Students. *Applied Environmental Education and Communication*, *17*(2), 96–105. https://doi.org/10.1080/1533015X.2017.1366882
Phan Hoang, T. T., & Kato, T. (2020). Measuring The Impact of Solid Waste Management Workshop Activities In Elementary Schools: A Six-Month Case Study In Da Nang city, Vietnam. *Applied Environmental Education and Communication*, *0*(0), 1–18. https://doi.org/10.1080/1533015X.2020.1784063
Pimdee, P. (2020). Antecedents of Thai student teacher sustainable consumption behavior. *Heliyon*, *6*(8), e04676. https://doi.org/10.1016/j.heliyon.2020.e04676
Pimdee, P. (2021). An Analysis of the Causal Relationships in Sustainable Consumption Behaviour (SCB) of Thai Student Science Teachers. *International Journal of Instruction*, *14*(1), 999–1018. https://doi.org/10.29333/IJI.2021.14159A
Purbawati, D. (2019). Investigating Effects of Education for Sustainable Development in Junior High School in Central Java. *International Journal of Business and Economic Affairs*, *4*(4), 163–176. https://doi.org/10.24088/ijbea-2019-44002
Quested, T. E., Marsh, E., Stunell, D., & Parry, A. D. (2013). Spaghetti Soup: The complex World of Food Waste Behaviours. *Resources, Conservation and Recycling*, *79*, 43–51. https://doi.org/10.1016/j.resconrec.2013.04.011
Razak, M., & Muntikah. (2017). *Ilmu Teknologi Pangan*. Kementerian Kesehatan Republik Indonesia.
Razali, M. Z. M., & Jamil, R. (2023). Sustainability Learning in Organizations: Integrated Model of Learning Approaches and Contextual Factors. *SAGE Open*, *13*(1), 1–16. https://doi.org/10.1177/21582440231155390
Reid, A., & Petocz, P. (2004). Learning Domains and The Process of Creativity. *Australian Educational Researcher*, *31*(2), 45–62. https://doi.org/10.1007/BF03249519
Richardson, C., & Mishra, P. (2018). Learning Environments That Support Student Creativity: Developing The SCALE. *Thinking Skills and Creativity*, *27*, 45–54. https://doi.org/10.1016/j.tsc.2017.11.004
Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2006). Productivity is not enough: A comparison of interactive and nominal brainstorming groups on idea generation and selection. *Journal of Experimental Social Psychology*, *42*(2),

244–251. https://doi.org/10.1016/j.jesp.2005.04.005
Rødnes, K. A., & Dolonen, J. A. (2023). Students' Ideas Of Contributing To Sustainable Development: A Study Of How Ideas Emerge, Travel And Expand Through Classroom Microblogging And Discussions. *Environmental Education Research*, *29*(5), 747–765. https://doi.org/10.1080/13504622.2022.2121807
Romani, S., Grappi, S., Bagozzi, R. P., & Barone, A. M. (2018). Domestic food practices: A study of food management behaviors and the role of food preparation planning in reducing waste. *Appetite*, *121*, 215–227. https://doi.org/10.1016/j.appet.2017.11.093
Saari, U. A., Damberg, S., Frömbling, L., & Ringle, C. M. (2021). Sustainable consumption behavior of Europeans: The influence of environmental knowledge and risk perception on environmental concern and behavioral intention. *Ecological Economics*, *189*(August). https://doi.org/10.1016/j.ecolecon.2021.107155
Sahakian, M., & Seyfang, G. (2018). A Sustainable Consumption Teaching Review: From Building Competencies To Transformative Learning. *Journal of Cleaner Production*, *198*, 231–241. https://doi.org/10.1016/j.jclepro.2018.06.238
Scott-Barrett, J., Johnston, S. K., Denton-Calabrese, T., McGrane, J. A., & Hopfenbeck, T. N. (2023). Nurturing Curiosity and Creativity In Primary School Classrooms. *Teaching and Teacher Education*, *135*(June 2022), 104356. https://doi.org/10.1016/j.tate.2023.104356
Seikkula-Leino, J., Jónsdóttir, S. R., Håkansson-Lindqvist, M., Westerberg, M., & Eriksson-Bergström, S. (2021). Responding To Global Challenges Through Education: Entrepreneurial, Sustainable, And Pro-Environmental Education In Nordic Teacher Education Curricula. *Sustainability (Switzerland)*, *13*(22). https://doi.org/10.3390/su132212808
Selviana, & Novembi Septiyanti. (2024). Motivasi Belajar, Penggunaan Internet Dan Kreativitas Dalam Mengerjakan Tugas Sekolah Pada Siswa Sma 24 Jakarta. *Jurnal Psikologi Pendidikan Dan Pengembangan SDM*, *12*(1), 42–52. https://doi.org/10.37721/psi.v12i1.930
Setiawan Syap, B. (2013). *Penghambat Kreativitas Anak Pada Siswa*.
Setyaningrum, T. W., Rahayu, E. S., & Setiati, N. (2015). Pembelajaran Berbasis Proyek Pembuatan Miniatur Ekosistem untuk Mengoptimalkan Hasil Belajar Ekologi pada Siswa SMA. *Journal of Biology Education*, *4*(3), 290–297.
Shadrina, S. N. (2024). *Pengaruh Pembelajaran STEM-ESD Terkait Responsible Consumption and Production Terhadap Kreativitas dan Aksi Siswa*. Universitas Pendidikan Indonesia.
Sharma, M. (2022). Understanding The Impact Of Social Learning Forms On Environmentally Sustainable Consumption Behavior Among School Children. *International Journal of Educational Management*, *36*(7), 1097–1111. https://doi.org/10.1108/IJEM-01-2022-0047
Smithwick, E., Baxter, E., Kim, K., Edel-Malizia, S., Rocco, S., & Blackstock, D. (2018). Interactive Videos Enhance Learning about Socio-Ecological Systems. *Journal of Geography*, *117*(1), 40–49. https://doi.org/10.1080/00221341.2017.1374433
Soleimani, S. M., Mughrabi, A., Al Far, M., & Jaeger, M. (2021). Development of

Student Sustainability Awareness, Attitudes and Actions. *Proceedings of the International CDIO Conference*, *9*(March), 14–25.

Sudibjo, N., Sari, N. J., & Lukas, S. (2020). Penerapan Pembelajaran Berbasis Projek Untuk Menumbuhkan Perilaku Kreatif, Minat Belajar, Dan Kerja Sama Siswa Kelas V Sd Athalia Tangerang. *Akademika*, *9*(01), 1–16. https://doi.org/10.34005/akademika.v9i01.736

Sugiarto, A., & Djukri, D. (2015). Pembelajaran Berbasis Sets Sebagai Upaya Meningkatkan Kreativitas Dalam Pemecahan Masalah Pencemaran Lingkungan. *Jurnal Inovasi Pendidikan IPA*, *1*(1), 1. https://doi.org/10.21831/jipi.v1i1.4527

Sund, P., & Gericke, N. (2020). Teaching contributions from secondary school subject areas to education for sustainable development–a comparative study of science, social science and language teachers. *Environmental Education Research*, *26*(6), 772–794. https://doi.org/10.1080/13504622.2020.1754341

Syukri, M., Halim, L., & Mohtar, L. E. (2017). Engineering Design Process: Cultivating Creativity Skills through Development of Science Technical Product Muhammad. *Jurnal Fizik Malaysia*, *38*(1), 10055–10065.

Tang, H., Ma, Y., & Ren, J. (2022). Influencing Factors and Mechanism Of Tourists' Pro-Environmental Behavior – Empirical Analysis Of The CAC-MOA Integration Model. *Frontiers in Psychology*, *13*(November), 1–18. https://doi.org/10.3389/fpsyg.2022.1060404

Tanner, C., & Kast, S. W. (2003). Promoting Sustainable Consumption: Determinants of Green Purchases by Swiss Consumers. *Psychology and Marketing*, *20*(10), 883–902. https://doi.org/10.1002/mar.10101

Tareze, M., Indri Astuti, & Afandi. (2022). Model Pembelajaran Kolaborasi SDGs Dalam Pendidikan Formal Sebagai Pengenalan Isu Global Untuk Meningkatkan Kesadaran Sosial Peserta Didik. *Visipena*, *13*(1), 42–53. https://doi.org/10.46244/visipena.v13i1.1978

Teigiserova, D. A., Hamelin, L., & Thomsen, M. (2020). Towards Transparent Valorization Of Food Surplus, Waste And Loss: Clarifying Definitions, Food Waste Hierarchy, And Role In The Circular Economy. *Science of the Total Environment*, *706*, 136033. https://doi.org/10.1016/j.scitotenv.2019.136033

Thibaut, L., Ceuppens, S., De Loof, H., De Meester, J., Goovaerts, L., Struyf, A., Boeve-De Pauw, J., Dehaene, W., Deprez, J., De Cock, M., Hellinckx, L., Knipprath, H., Langie, G., Struyven, K., Van De Velde, D., Van Petegem, P., & Depaepe, F. (2018). Integrated STEM Education: A Systematic Review of Instructional Practices in Secondary Education. *Of STEM Education*, *3*(1), 2. https://eric.ed.gov/?id=EJ1178347

Tilbury, D. (2011). Higher Education's Commitment to Sustainability: From Understanding to Action PART 1: THE CONTEXT Higher Education for Sustainability: A Global Overview of Commitment and Progress. *Higher Education in the World*, *4*(1), 18–28.

Trott, C. D., & Weinberg, A. E. (2020). Science Education for Sustainability: Strengthening Children's Science Engagement Through Climate Change Learning and Action. *Sustainability*, *12*(16), 6400. https://doi.org/10.3390/su12166400

Truong, H. N. (2024). Students' Perspectives on the Use of Teacher Questions to Promote Critical Thinking in EFL Classrooms. *International Journal of*

Language Instruction, *3*(2), 1–17. https://doi.org/10.54855/ijli.24321

Tseng, K. H., Chang, C. C., Lou, S. J., & Chen, W. P. (2013). Attitudes Towards Science, Technology, Engineering and Mathematics (STEM) in A Project-Based Learning (PjBL) Environment. *International Journal of Technology and Design Education*, *23*(1), 87–102. https://doi.org/10.1007/s10798-011-9160-x

Tumuyu, S. S., Hasibuan, H. S., & Kartini, A. Z. (2024). Food Waste Management Strategies suitable for households as sustainable food. *Journal of Infrastructure, Policy and Development*, *8*(5), 1–16.

UNESCO. (2017). Education for Sustainable Development Goals: Learning Objectives. In *Education for Sustainable Development Goals: learning objectives*. https://doi.org/10.54675/cgba9153

Valor, C., Antonetti, P., & Merino, A. (2020). The relationship between moral competences and sustainable consumption among higher education students. *Journal of Cleaner Production*, *248*, 119161. https://doi.org/10.1016/j.jclepro.2019.119161

Wang, J., & Wu, L. (2016). The Impact of Emotions on the Intention of Sustainable Consumption Choices: Evidence from A Big City in An Emerging Country. *Journal of Cleaner Production*, *126*, 325–336. https://doi.org/10.1016/j.jclepro.2016.03.119

Widodo, A. (2021). *Pembelajaran Ilmu Pengetahuan Alam*.

Widyadhari, A., & Jufri, A. W. (2023). *Pengaruh Model Project Based Learning Terintegrasi Biopreneurship Terhadap Penguasaan Konsep dan Kreativitas Siswa*. *5*(4).

Williams, H., Lindström, A., Trischler, J., Wikström, F., & Rowe, Z. (2020). Avoiding Food Becoming Waste In Households – The Role Of Packaging In Consumers' Practices Across Different Food Categories. *Journal of Cleaner Production*, *265*. https://doi.org/10.1016/j.jclepro.2020.121775

Wongsaichia, S., Naruetharadhol, P., Schrank, J., Phoomsom, P., Sirisoonthonkul, K., Paiyasen, V., Srichaingwang, S., & Ketkaew, C. (2022). Influences of Green Eating Behaviors Underlying the Extended Theory of Planned Behavior: A Study of Market Segmentation and Purchase Intention. *Sustainability (Switzerland)*, *14*(13). https://doi.org/10.3390/su14138050

Wulandari, A. S., Suardana, I. N., & Devi, N. L. P. L. (2019). *Pengaruh Model Pembelajaran Berbasis Proyek Terhadap Kreativitas Siswa SMP Pada Pembelajaran IPA*. *2*(April), 47–58.

Yeo, J., Chopra, S. S., Zhang, L., & An, A. K. (2019). Life cycle assessment (LCA) of food waste treatment in Hong Kong: On-site fermentation methodology. *Journal of Environmental Management*, *240*(March), 343–351. https://doi.org/10.1016/j.jenvman.2019.03.119

Yeo, J., Oh, J. ik, Cheung, H. H. L., Lee, P. K. H., & An, A. K. (2019). Smart Food Waste Recycling Bin (S-FRB) to Turn Food Waste Into Green Energy Resources. *Journal of Environmental Management*, *234*(August 2018), 290–296. https://doi.org/10.1016/j.jenvman.2018.12.088

Zguir, M. F., Dubis, S., & Koc, M. (2021). Embedding Education for Sustainable Development (ESD) and SDGs Values in Curriculum : A Comparative Review on Qatar , Singapore and New Zealand. *Journal of Cleaner Production*, *319*(August), 128534.

https://doi.org/10.1016/j.jclepro.2021.128534
Zhang, H., & Lahr, M. L. (2018). Households' Energy Consumption Change in China: A Multi-Regional Perspective. *Sustainability (Switzerland)*, *10*(7), 1–17. https://doi.org/10.3390/su10072486
Zhang, J., Yang, Y., Ge, J., Liang, X., & An, Z. (2023). Stimulating Creativity in The Classroom: Eexamining the Impact of Sense of Place on Students ' Creativity and the Mediating Effect of Classmate Relationships. *BMC Psychology*, *11*(432), 1–12.
Zhao, G., & Cheah, K. S. L. (2023). The Challenges of Malaysian Private Universities in Reaching Sustainable Education Toward Responsible Consumption. *Cleaner and Responsible Consumption*, *10*(July), 100130. https://doi.org/10.1016/j.clrc.2023.100130
Zheng, Q. J., Xu, A. X., Kong, D. Y., Deng, H. P., & Lin, Q. Q. (2018). Correlation Between The Environmental Knowledge, Environmental Attitude, And Behavioral Intention Of Tourists For Ecotourism In China. *Applied Ecology and Environmental Research*, *16*(1), 51–62. https://doi.org/10.15666/aeer/1601_051062