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Ecological Footprint of Electronic Devices: a Transdisciplinary Analysis to Guide Responsible Technology Consumption

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ABSTRACT

The ecological footprint of electronic devices, stemming from their production, use, and disposal, poses significant environmental challenges. This essay addresses the issue through a transdisciplinary approach, integrating ecology, engineering, sociology, and education to promote responsible technological consumption. The general objective: To analyze the ecological footprint of electronic devices and propose educational strategies to foster sustainable practices, aligned with sustainable development goals. A mixed-methods approach was used, combining Life Cycle Assessment (LCA) to quantify environmental impacts and semi-structured interviews with 20 consumers and 10 experts to explore perceptions. Data were triangulated to design educational strategies (Hernández Sampieri, Fernández Collado, and Bautista Lucio 2014, 537). Results: The LCA showed that production accounts for 60-70% of the carbon footprint, with 82.6% of e-waste not recycled (Forti et al. 2020, 22). Interviews revealed that 70% of consumers are unaware of these impacts, and only 30% engage in recycling. Discussion: The findings confirm the unsustainability of current processes, consistent with Babbitt et al. (2020, 45). Education must promote systemic thinking, while public policies should encourage modular designs and recycling initiatives. Conclusions: A transdisciplinary approach, integrating education, technology, and policy, is essential to mitigate the ecological footprint. Recommended actions include LCA-based educational modules, recycling workshops, and awareness campaigns to transform technological consumption (Sterling 2010, 512).

Keywords: Ecological footprint, electronic devices, transdisciplinarity, responsible consumption, education.

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