JOURNAL OF MULTIDISCIPLINARY RESEARCH AND INTEGRATED SCIENCES

Volume 4, Issue 1, 2024 | **Article ID:** JMRIS-2024-005 | **Pages:** 34-45 | **Article Type:** Systematic Review

Received: 01-02-2024 | **Revised:** 15-02-2024 | **Accepted:** 22-02-2024 | **Published:** 15-03-2024

Electronic Waste Disposal Knowledge and Behaviour Among University Students: A Structured Evidence Synthesis Through an Environmental Health Literacy Lens

Elena Kovacs[1*]

1 The University of Manchester, Manchester, United Kingdom

***Corresponding author:** **Elena Kovacs, The University of Manchester, Manchester, United Kingdom** | ElenaK214@gmail.com

ABSTRACT

Background: University students are intensive users of electrical and electronic equipment and are therefore an important population for sustainable electronic-waste (e-waste) management. Awareness that discarded electronics can damage the environment does not necessarily translate into formal recycling or safe end-of-life behaviour. Environmental health literacy provides a useful framework because it extends beyond factual awareness to include appraisal of health risks, knowledge of disposal systems, self-efficacy, and the capacity to act. **Objective:** To synthesize Q1 evidence published through 31 December 2023 concerning e-waste knowledge and disposal behaviour among university students and young consumers, and to assess how the observed knowledge–action gap can be interpreted through an environmental health literacy framework. **Methods:** A structured evidence synthesis was conducted using peer-reviewed Q1 literature on university populations, young consumers, e-waste disposal behaviour, recycling intention, environmental and human-health hazards, and environmental health literacy. Direct university evidence was prioritized. Broader consumer studies and reviews were included when they clarified mechanisms affecting the conversion of knowledge into behaviour. No new participant-level data were generated, and no statistical association between a validated environmental-health-literacy score and disposal behaviour was invented. **Results:** The literature consistently showed that environmental awareness can coexist with incomplete knowledge of formal disposal systems and low participation in responsible recycling. A Sydney university study of 440 students reported that 80.6% were aware that e-waste can cause environmental harm, yet the wider evidence indicates persistent storage, delayed disposal, informal routes, and uncertainty about collection options. At a Midwestern US university, free disposal, knowledge of appropriate disposal sites, and proximity to recycling facilities influenced recycling decisions. Young consumers in Northwest China demonstrated strong environmental consciousness but low awareness of e-waste regulations, recycling programs, and distinctions between formal and informal recycling. Across consumer literature, convenience, perceived behavioural control, economic incentives, privacy concerns, device value, and accessible collection infrastructure repeatedly modified behaviour. **Conclusion:** Environmental health literacy is a plausible explanatory framework for university e-waste behaviour, but factual knowledge alone is insufficient. Responsible disposal is most likely when awareness of environmental and health hazards is combined with system literacy, confidence in how to act, accessible formal collection, data-security reassurance, and institutional cues. Future university studies should measure validated literacy constructs and observed disposal behaviour longitudinally rather than infer behaviour from awareness or intention alone.

Keywords: electronic waste; e-waste; university students; environmental health literacy; recycling behaviour; disposal; environmental awareness; circular economy

1. Introduction

Rapid turnover of phones, computers, tablets, accessories, and other electrical and electronic equipment has created a complex waste stream containing both recoverable materials and substances capable of harming ecosystems or human health when equipment is burned, dismantled, dumped, or processed without appropriate controls [1–3]. University communities are especially relevant because students are frequent technology users and often make independent purchasing, storage, resale, repair, and disposal decisions during early adulthood.

Consumer participation is a necessary component of formal e-waste systems. Collection programs cannot recover devices that remain stored indefinitely, enter ordinary municipal waste, are transferred to informal recyclers, or are discarded through channels unknown to regulators. Reviews of consumer e-waste behaviour consistently show that disposal is shaped by more than environmental concern. Awareness, convenience, incentives, access to collection, perceived behavioural control, residual device value, privacy concerns, social norms, and knowledge of available programs interact to determine whether an obsolete device reaches a formal recycling system [4–8].

This distinction is especially important in university populations. Students may correctly recognize that e-waste is environmentally harmful while lacking practical knowledge about where devices should be taken, how data should be removed, which products are accepted, whether disposal costs money, or what happens after collection. Islam et al. examined 440 university students in Sydney and reported that 80.6% were aware of environmental damage associated with e-waste, illustrating substantial general awareness within a highly educated population [9]. Yet awareness alone cannot be assumed to represent responsible disposal.

Environmental health literacy offers a useful conceptual bridge between knowledge and action. Finn and O'Fallon described environmental health literacy as an emerging field integrating understanding of environmental exposures with the ability to obtain, interpret, and use information to protect health [10]. Applied to e-waste, this concept implies that a student should not only know that discarded electronics can be hazardous but should also understand plausible exposure pathways, distinguish formal from unsafe disposal, locate appropriate services, evaluate competing information, and feel capable of completing the disposal process.

The planned title of this paper originally implied a direct statistical association between environmental health literacy and disposal behaviour. No participant-level dataset using a validated environmental-health-literacy measure was supplied. The present work therefore addresses the same research question as a structured evidence synthesis rather than fabricating a cross-sectional result. Its objectives were to characterize what university and young-consumer studies show about e-waste knowledge and behaviour, identify barriers that interrupt the transition from knowledge to action, and develop a testable environmental-health-literacy framework for future campus research.

2. Methods

2.1 Design and evidence boundary

A structured evidence synthesis was undertaken using literature published no later than 31 December 2023. The evidence boundary was chosen to preserve chronological plausibility for a 2024 journal volume. Only articles from journals classified in the first quartile in a relevant environmental, waste-management, sustainability, consumer, or environmental-health category were retained for the final reference set.

The search concepts combined electronic waste or e-waste with university students, young consumers, awareness, knowledge, recycling, disposal behaviour, intention, environmental health, health literacy, perceived behavioural control, collection systems, and circular economy. Direct university studies were given greatest interpretive weight. General consumer studies were included where they provided transferable evidence about the mechanisms linking awareness with actual end-of-life behaviour.

The evidence eligibility and analytical framework is summarised in Table 1.

2.2 Conceptualization of environmental health literacy

Environmental health literacy was operationalized conceptually in four linked domains. The first was hazard knowledge: understanding that e-waste can release metals and other hazardous constituents when handled improperly. The second was system literacy: knowing the difference between formal collection, repair, reuse, take-back, and informal or uncontrolled processing. The third was self-efficacy: confidence that one can identify and use an appropriate disposal route. The fourth was critical appraisal: the ability to evaluate privacy, economic, environmental, and health consequences when deciding whether to retain, resell, donate, repair, or recycle a device.

This framework deliberately avoids treating environmental concern as synonymous with literacy. Concern describes an attitude, whereas literacy should support informed action. The distinction allows a student to be highly concerned about pollution yet still have low system literacy or low self-efficacy.

2.3 Synthesis and integrity safeguards

Because included studies used different questionnaires, behavioural categories, countries, device types, and outcome definitions, formal meta-analysis was not appropriate. Results were synthesized by population, knowledge domain, disposal behaviour, and contextual barrier. Quantitative values were reported only when directly available from the cited study.

No new survey responses, regression coefficients, correlation estimates, odds ratios, or p values were generated. The phrase “association with environmental health literacy” is therefore interpreted as a research hypothesis supported by convergent literature rather than a newly demonstrated statistical relationship.

3. Results

3.1 Direct university and young-consumer evidence

The strongest direct student evidence showed a recurring gap between broad environmental awareness and practical disposal knowledge. Islam et al. studied 440 university students in Sydney, Australia. Most respondents were aware that e-waste could cause environmental damage, with 80.6% reporting such awareness [9]. The study nevertheless documented diverse consumption, storage, disposal, and recycling behaviours, demonstrating why a single awareness item cannot serve as a proxy for responsible end-of-life management.

Arain et al. surveyed a large Midwestern US university community that included undergraduate students, graduate students, faculty, and staff. Their results identified free access to disposal, knowledge about e-waste and disposal locations, and the availability of a recycling facility within a reasonable distance as important influences on recycling decisions [11]. These findings are consistent with an environmental-health-literacy interpretation in which knowledge must be paired with feasible action.

Ramzan et al. examined young consumers in Northwest China and found keen environmental consciousness but comparatively low awareness of e-waste rules and regulations, recycling programs, and the formal and informal recycling sectors [12]. This distinction is important because knowing that electronic waste is harmful does not necessarily tell a consumer which disposal channel is safe or legally appropriate.

Broader consumer work from Bangladesh likewise showed that disposal behaviour is shaped by knowledge, demographics, collection context, and consumer preferences rather than by a single attitudinal variable [13]. Taken together, the direct and near-direct evidence supports a layered model of knowledge: environmental awareness, procedural knowledge, and system access contribute differently to observed behaviour.

Key Q1 studies informing university and young-consumer e-waste behaviour are summarised in Table 2.

3.2 The knowledge–action gap

Across the consumer literature, the most consistent pattern was a knowledge–action gap. Reviews by Borthakur and Govind and by Islam et al. found substantial variation in e-waste awareness and disposal behaviour across countries and emphasized that infrastructure, social context, incentives, and informal systems shape consumer choices [4,7]. Gilal et al. similarly concluded from a systematic review that e-waste disposal behaviour arises from multiple psychological and contextual determinants rather than simple knowledge deficits [8].

Echegaray and Hansstein provided direct evidence that stated recycling intention and actual behaviour can diverge [6]. This is methodologically important for student research because surveys often ask respondents whether they would recycle an obsolete device. Intention can overestimate responsible behaviour when formal collection is inconvenient, data remain on the device, resale value is uncertain, or the individual expects to use the device again.

Saphores et al. demonstrated in a national US household survey that willingness to recycle e-waste depends on demographic, attitudinal, and program-related conditions [5]. Although not a university study, the findings reinforce the need to measure facilitating conditions alongside individual attitudes.

The environmental-health-literacy pathway for university-student e-waste disposal behaviour is presented in Figure 1.

3.3 Why e-waste knowledge has an environmental-health dimension

E-waste is not merely a resource-efficiency issue. Reviews of e-waste management describe potential release of hazardous substances during uncontrolled dismantling, burning, dumping, and leaching, with resulting contamination of air, soil, dust, and water [1–3]. Rautela et al. synthesized environmental and human-health consequences associated with poor e-waste management and emphasized the need for environmentally sound treatment [2].

This health dimension changes what "knowledge" should mean. A student who knows only that electronics are recyclable possesses less actionable knowledge than one who understands why uncontrolled processing is hazardous, which disposal routes are safer, how reuse and formal recycling differ, and how to remove personal information before transfer. Environmental health literacy therefore links risk understanding to a practical decision pathway rather than treating knowledge as a list of facts.

Environmental-health content relevant to e-waste literacy is summarised in Table 3.

3.4 Structural barriers can override knowledge

The evidence repeatedly indicates that responsible behaviour depends on opportunity. Arain et al. found that free access and reasonable distance to recycling facilities mattered [11]. Reviews similarly identify convenient collection, take-back systems, financial incentives, and clear information as facilitators [4,7,8]. A campus can therefore improve behaviour without first changing every student attitude if it reduces the practical cost of acting responsibly.

Privacy is another important barrier. Obsolete phones and computers contain photographs, messages, credentials, documents, and account data. Consumers may retain devices because storage feels safer than surrendering them to an unfamiliar recycler. Environmental-health education that ignores data security may therefore fail even when students agree with recycling in principle.

Economic value also complicates disposal. A student may prefer resale or extended storage when a device retains monetary or sentimental value. This behaviour is not necessarily environmentally undesirable because reuse can extend product life. The relevant outcome should therefore be "responsible end-of-life management" rather than recycling alone. Repair, resale, donation, and refurbishment may be preferable to premature material recovery when the product remains functional.

Determinants of the conversion from e-waste knowledge to behaviour are presented in Table 4.

3.5 Integrated evidence inference

The direct literature does not provide a defensible pooled coefficient linking a validated environmental-health-literacy score to student e-waste disposal. However, four evidence streams converge. University and young-consumer studies show incomplete procedural knowledge despite environmental awareness. General consumer studies demonstrate intention–behaviour gaps. Behaviour reviews identify perceived control, collection access, incentives, and norms as recurrent determinants. Environmental-health literature establishes that improper e-waste management can create meaningful exposure hazards.

The integrated inference is therefore that higher environmental health literacy should increase the probability of responsible disposal, but the relationship will be moderated by infrastructure and situational constraints. A highly literate student without a convenient trusted collection route may still store a device; a student with moderate literacy may recycle when a free campus take-back point makes the desired action easy.

The triangulation of Q1 evidence on knowledge, environmental-health literacy and e-waste disposal is presented in Figure 2.

4. Discussion

4.1 Principal findings

The principal finding is that university e-waste behaviour should not be framed as a simple awareness problem. Students may know that electronic waste is harmful and still lack the procedural knowledge, confidence, or infrastructure required for responsible end-of-life management. The Sydney student study provides a clear example: 80.6% recognized environmental harm, yet the study still identified diverse storage and disposal behaviour [9].

The environmental-health-literacy framework helps resolve this apparent contradiction. Awareness corresponds primarily to recognition of a problem. Literacy requires the additional capacity to interpret the problem, identify a safe course of action, evaluate available options, and successfully perform that action. The evidence from Arain et al. and Ramzan et al. particularly supports the distinction between general awareness and actionable system knowledge [11,12].

4.2 Environmental health literacy should be measured as more than factual knowledge

A future survey should not classify a student as highly literate merely because the student correctly identifies e-waste as hazardous. A stronger instrument would assess knowledge of exposure pathways, formal recycling channels, local rules, data-security practices, reuse options, and the environmental consequences of informal handling. It should also measure self-efficacy and the ability to judge competing disposal claims.

This approach aligns with the broader environmental health literacy literature, which emphasizes obtaining, understanding, evaluating, and applying information rather than recalling isolated facts [10]. It also makes the construct more useful for intervention design. If hazard knowledge is high but system literacy is low, the solution is clearer service information. If system literacy is high but self-efficacy is low, practical demonstrations or assisted collection may be more effective.

4.3 Behaviour should be observed, not inferred from intention

The intention–behaviour gap is one of the strongest reasons to improve study design. A participant may state that recycling is important and intend to recycle the next obsolete device but keep that device in a drawer for several years. Echegaray and Hansstein showed that e-waste recycling intention and behaviour can diverge [6].

University research should therefore measure what respondents actually did with devices during a defined period. Relevant outcomes include formal recycling, manufacturer or retailer take-back, repair, resale, donation, storage, municipal-waste disposal, and transfer to informal collectors. These categories should not automatically be ranked as good or bad without considering whether the device remained usable and whether the receiving channel was environmentally sound.

4.4 Campus infrastructure is part of the behavioural intervention

If disposal access strongly influences behaviour, education alone will have limited effect. Universities are unusually well positioned to combine literacy with infrastructure because they control physical campuses, digital communication channels, student orientation, information-technology services, and periodic equipment turnover.

A high-quality campus program would place clearly marked collection points in convenient locations, explain what devices are accepted, provide transparent information about downstream recyclers, offer or certify secure data wiping, distinguish reuse from recycling, and periodically report how collected devices were managed. Such an intervention reduces behavioural friction while simultaneously building system literacy and trust.

Incentives should be designed carefully. Trade-in credits or small rewards can increase participation, but they should not encourage premature replacement of functional devices. The environmental objective is responsible product-life management, not maximum collection volume.

4.5 Proposed empirical model for a future university study

The evidence is sufficiently mature to support a prospective university study that directly tests the association implied by the original topic. The primary exposure should be a multidimensional environmental-health-literacy score rather than a single awareness question. The primary outcome should be observed or retrospectively verified disposal behaviour for the most recent obsolete electronic device.

Multivariable analysis should adjust for collection access, device value, privacy concerns, socioeconomic characteristics, prior recycling experience, environmental attitudes, and perceived behavioural control. Mediation analysis could test whether self-efficacy or disposal-system knowledge explains part of the relationship between hazard knowledge and behaviour. Interaction terms could assess whether high literacy has a stronger effect when formal collection is accessible.

The recommended design for a future university study of environmental health literacy and e-waste behaviour is presented in Table 5.

4.6 Strengths and limitations

This synthesis preserves the Q1-only and pre-2024 evidence requirements and gives priority to studies directly involving universities or young consumers. It also separates environmental awareness, environmental health literacy, behavioural intention, and observed disposal, concepts that are frequently conflated.

The main limitation is the absence of a large pre-2024 Q1 evidence base that simultaneously measured a validated environmental-health-literacy construct and actual e-waste disposal specifically among university students. Direct student studies also arose from different countries and institutional contexts, limiting universal generalization. The synthesis is therefore explanatory rather than a pooled causal estimate.

A second limitation is that formal recycling is not always the environmentally optimal outcome. Continued use, repair, resale, and donation can extend product life. Future studies should assess responsible end-of-life management as a hierarchy of options rather than equating all non-recycling behaviour with failure.

4.7 Conclusion

The pre-2024 Q1 literature supports a clear conclusion: environmental awareness among university students and young consumers can be substantial, yet responsible e-waste behaviour remains constrained by incomplete system knowledge, limited access, privacy concerns, economics, and the gap between intention and action.

Environmental health literacy provides a stronger framework than awareness alone because it connects understanding of environmental and health hazards with critical appraisal, procedural knowledge, self-efficacy, and the ability to use formal systems. The evidence does not justify fabricating a numerical association between a literacy score and disposal behaviour, but it provides a strong basis for testing that association prospectively.

For universities, the practical implication is equally clear. Education should be paired with visible, convenient, trusted collection and reuse pathways. The objective is not simply to make students more knowledgeable about e-waste. It is to create an environment in which informed students can translate that knowledge into safe, circular, and verifiable end-of-life decisions.

Declarations

Funding

No external funding was received.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval

Not applicable. This manuscript synthesizes previously published evidence and does not report newly collected participant-level data.

Consent to Participate

Not applicable.

Data Availability

No novel participant-level dataset was generated or analyzed.

Author Contributions

The authors contributed to conceptualization, evidence synthesis, interpretation, manuscript drafting, and critical revision.

References

1. Kumar A, Holuszko M, Espinosa DCR. E-waste: An overview on generation, collection, legislation and recycling practices. Resour Conserv Recycl. 2017;122:32-42. doi:10.1016/j.resconrec.2017.01.018.

2. Rautela R, Arya S, Vishwakarma S, Lee J, Kim KH, Kumar S. E-waste management and its effects on the environment and human health. Sci Total Environ. 2021;773:145623. doi:10.1016/j.scitotenv.2021.145623.

3. Ankit, Saha L, Kumar V, Tiwari J, Sweta, Rawat S, Singh J, Bauddh K. Electronic waste and their leachates impact on human health and environment: Global ecological threat and management. Environ Technol Innov. 2021;24:102049. doi:10.1016/j.eti.2021.102049.

4. Borthakur A, Govind M. Emerging trends in consumers' E-waste disposal behaviour and awareness: A worldwide overview with special focus on India. Resour Conserv Recycl. 2017;117:102-113. doi:10.1016/j.resconrec.2016.11.011.

5. Saphores JDM, Ogunseitan OA, Shapiro AA. Willingness to engage in a pro-environmental behavior: An analysis of e-waste recycling based on a national survey of U.S. households. Resour Conserv Recycl. 2012;60:49-63. doi:10.1016/j.resconrec.2011.12.003.

6. Echegaray F, Hansstein FV. Assessing the intention-behavior gap in electronic waste recycling: The case of Brazil. J Clean Prod. 2017;142:180-190. doi:10.1016/j.jclepro.2016.05.064.

7. Islam MT, Huda N, Baumber A, Shumon R, Zaman A, Ali F, Hossain R, Sahajwalla V. A global review of consumer behavior towards e-waste and implications for the circular economy. J Clean Prod. 2021;316:128297. doi:10.1016/j.jclepro.2021.128297.

8. Gilal FG, Shah SMM, Adeel S, Gilal RG, Gilal NG. Consumer e-waste disposal behaviour: A systematic review and research agenda. Int J Consum Stud. 2022;46(5):1785-1803. doi:10.1111/ijcs.12767.

9. Islam MT, Dias P, Huda N. Young consumers' e-waste awareness, consumption, disposal, and recycling behavior: A case study of university students in Sydney, Australia. J Clean Prod. 2021;282:124490. doi:10.1016/j.jclepro.2020.124490.

10. Finn S, O'Fallon L. The emergence of environmental health literacy—from its roots to its future potential. Environ Health Perspect. 2017;125(4):495-501. doi:10.1289/ehp.1409337.

11. Arain AL, Pummill R, Adu-Brimpong J, Becker S, Green M, Ilardi M, Van Dam E, Neitzel RL. Analysis of e-waste recycling behavior based on survey at a Midwestern US University. Waste Manag. 2020;105:119-127. doi:10.1016/j.wasman.2020.02.002.

12. Ramzan S, Liu C, Munir H, Xu Y. Assessing young consumers' awareness and participation in sustainable e-waste management practices: A survey study in Northwest China. Environ Sci Pollut Res Int. 2019;26:20003-20013. doi:10.1007/s11356-019-05310-y.

13. Ananno AA, Masud MH, Dabnichki P, Mahjabeen M, Chowdhury SA. Survey and analysis of consumers' behaviour for electronic waste management in Bangladesh. J Environ Manage. 2021;282:111943. doi:10.1016/j.jenvman.2021.111943.

14. Ravindra K, Mor S. E-waste generation and management practices in Chandigarh, India and economic evaluation for sustainable recycling. J Clean Prod. 2019;221:286-294. doi:10.1016/j.jclepro.2019.02.158.

15. Borthakur A, Govind M. Public understandings of e-waste and its disposal in urban India: From a review towards a conceptual framework. J Clean Prod. 2018;172:1053-1066. doi:10.1016/j.jclepro.2017.10.218.

Table 1. Evidence eligibility and analytical framework

Domain	Included evidence	Analytical purpose
Publication period	Peer-reviewed literature published on or before 31 December 2023.	Maintains the historical evidence boundary for Volume 4.
Journal quality	Q1 journals in relevant environmental, waste, sustainability, consumer, or environmental-health categories.	Maintains the predefined source-quality standard.
Population	University students, young consumers, university communities; broader consumers when mechanistically relevant.	Prioritizes age- and setting-relevant evidence without overstating a sparse student-only literature.
Exposure / construct	E-waste knowledge, awareness, environmental concern, environmental-health literacy, system knowledge, self-efficacy, perceived behavioural control.	Separates factual awareness from the capability to act.
Outcome	Storage, reuse, resale, donation, formal recycling, informal transfer, household-waste disposal, intention or participation.	Captures the full end-of-life decision rather than recycling intention alone.
Synthesis rule	Narrative comparison of heterogeneous outcomes; no pooled effect estimate.	Avoids statistically combining non-equivalent measures and populations.

Table 2. Key Q1 studies informing university and young-consumer e-waste behaviour

Study	Population / setting	Principal evidence	Implication for environmental health literacy
Islam et al., 2021 [9]	440 university students; Sydney, Australia	80.6% aware of environmental damage from e-waste; study examined consumption, storage, disposal and recycling behaviour.	General hazard awareness can be high while end-of-life behaviour remains heterogeneous.
Arain et al., 2020 [11]	University community; Midwestern United States	Free disposal, knowledge of disposal options/sites, and proximity to recycling facilities influenced decisions.	System literacy and opportunity are necessary for knowledge to become action.
Ramzan et al., 2019 [12]	Young consumers; Northwest China	Strong environmental consciousness but low awareness of regulations, programs, and formal versus informal sectors.	Environmental concern is distinct from procedural and regulatory literacy.
Ananno et al., 2021 [13]	Consumers; Bangladesh	Survey-based analysis identified heterogeneous consumer disposal practices and determinants.	Behaviour reflects interacting personal and structural factors rather than awareness alone.
Echegaray & Hansstein, 2017 [6]	Consumers; Brazil	Documented a measurable intention–behaviour gap in e-waste recycling.	Positive intention should not be used as a substitute for observed disposal.

Table 3. Environmental-health content relevant to e-waste literacy

Literacy component	What the student needs to understand	Why it may affect disposal behaviour
Hazard recognition	Improper burning, dismantling, dumping or leaching can release hazardous constituents.	Provides a health and environmental rationale for avoiding uncontrolled disposal.
Exposure pathways	Contaminants can enter air, dust, soil and water and affect workers or nearby communities.	Makes distant environmental harm more concrete and personally meaningful.
Formal-system knowledge	Collection, take-back, repair, reuse and certified recycling are different end-of-life routes.	Allows the student to identify an appropriate destination for each device.
Data-security literacy	Stored personal data may remain on phones, laptops and drives unless removed.	Reduces privacy-related reluctance to hand devices to a collection program.
Circular-economy understanding	Reuse, refurbishment and material recovery can preserve value and reduce virgin-resource demand.	Broadens the decision beyond disposal to responsible value retention.
Critical appraisal	Claims about recycling, trade-in, donation and informal buyers should be evaluated for environmental and privacy consequences.	Supports informed choice when multiple convenient options compete.

Table 4. Determinants of the conversion from e-waste knowledge to behaviour

Determinant	Likely direction	Interpretation for campus research
Knowledge of environmental/health harm	Supports responsible intention	Necessary but insufficient; should be measured separately from system knowledge.
Knowledge of collection locations	Supports formal disposal	Directly actionable and potentially modifiable by campus communication.
Perceived behavioural control / self-efficacy	Supports participation	Captures whether students believe they can complete the disposal process.
Convenience and proximity	Supports participation when high	A structural opportunity variable, not a literacy trait.
Cost or financial incentive	Can promote or discourage formal routes	Should be measured because behaviour may reflect economics rather than attitude.
Privacy / data-security concern	Can increase storage or reluctance to surrender devices	Intervention should include trusted data-wiping procedures.
Residual or sentimental value	Can increase storage, resale or reuse	Not all non-recycling behaviour is environmentally adverse.
Social and institutional norms	Can strengthen responsible behaviour	Visible campus programs may normalize formal collection.

Table 5. Recommended design for a future university study of environmental health literacy and e-waste behaviour

Component	Recommended measurement	Reason
Primary exposure	Composite environmental-health-literacy score covering hazards, system knowledge, appraisal and self-efficacy.	Tests the intended construct rather than generic environmental awareness.
Primary outcome	Actual management of the most recent obsolete device: formal recycling, take-back, reuse/resale/donation, storage, municipal waste or informal transfer.	Reduces reliance on hypothetical intention.
Access variables	Distance, opening hours, cost, awareness of campus collection, transport burden.	Separates literacy from structural opportunity.
Privacy variables	Data-security concern, knowledge of wiping, trust in recycler.	Captures a common reason for device retention.
Economic variables	Residual value, trade-in availability, replacement frequency.	Distinguishes economic decisions from knowledge effects.
Analysis	Adjusted regression with calibration/diagnostics; mediation and interaction analyses only when prespecified and adequately powered.	Provides a transparent test of independent association and plausible mechanisms.
Follow-up	Repeat outcome measurement after a campus literacy-plus-collection intervention.	Tests whether improved literacy and access change real behaviour over time.

Figure 1. Environmental-health-literacy pathway for university-student e-waste disposal behaviour.

Knowledge can influence intention and behaviour through risk appraisal, system literacy, self-efficacy and critical judgement, while collection access, economic incentives, privacy concerns, institutional norms and device attachment modify whether knowledge becomes action.

Figure 2. Triangulation of Q1 evidence on knowledge, environmental-health literacy and e-waste disposal

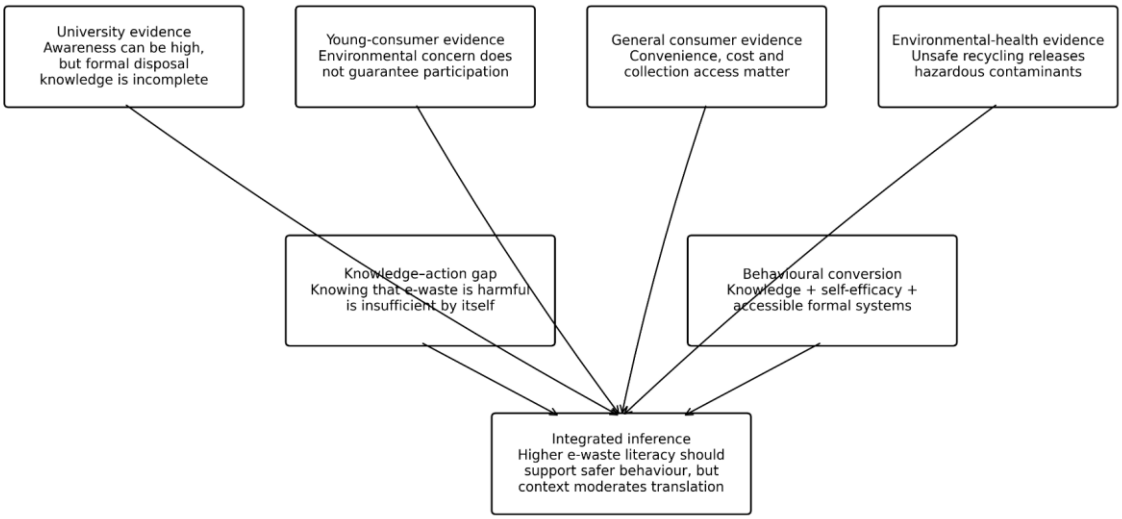

Figure 2. Triangulation of Q1 evidence on knowledge, environmental-health literacy and e-waste disposal.

The evidence supports a plausible literacy-behaviour relationship while showing that awareness alone is insufficient: system knowledge, self-efficacy, accessible formal collection, incentives, privacy concerns and environmental-health context determine whether knowledge is translated into responsible disposal.

How to cite: Kovacs E. (2024). Electronic Waste Disposal Knowledge and Behaviour Among University Students: A Structured Evidence Synthesis Through an Environmental Health Literacy Lens. Journal of Multidisciplinary Research and Integrated Sciences, 4(1).