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CHARACTER EDUCATION, DIGITAL CITIZENSHIP, AND ECOLOGICAL LITERACY:

A Study of Secondary School Students in the 21st Century

Kusum Lata Kumari
Research Scholar, School of Educational Training and Research
Aryabhatta Knowledge University, Patna, Bihar, India
Registration No.: 14503602001
Dr. (Fr.) Thomas Perumalil, S.J.
Professor, School of Educational Training and Research
Aryabhatta Knowledge University, Patna, Bihar

Abstract- The 21st century presents secondary school students with unprecedented challenges encompassing rapid technological change, shifting moral landscapes, and escalating ecological crises. This study investigates the interrelationships among character education, digital citizenship competencies, and ecological literacy in secondary school students. Drawing on a mixed-methods design, data were collected from 320 students (grades 9–12) across four secondary schools, supplemented by teacher interviews and classroom observations. Findings reveal that structured character education programmes significantly correlate with higher digital citizenship scores ($r = 0.61$, $p < 0.001$) and improved ecological awareness ($r = 0.54$, $p < 0.001$). Students with stronger moral reasoning foundations demonstrated more responsible online behaviours and greater environmental stewardship. The paper argues that integrating these three domains within a unified curricular framework yields holistic adolescent development. Recommendations for educators, curriculum planners, and policymakers are provided.

Keywords: character education, digital citizenship, ecological literacy, secondary school, moral development, environmental awareness

I. INTRODUCTION

Adolescence constitutes a pivotal juncture in the formation of identity, values, and civic disposition. Secondary school students — situated between childhood and

adulthood — are simultaneously navigating complex digital environments, confronting ethical dilemmas online, and witnessing the tangible consequences of global environmental degradation. Yet traditional educational frameworks have often treated character formation, technology use, and environmental education as disparate curricular concerns, failing to capitalise on their potential synergies.

The surge of social media, misinformation, cyberbullying, and screen addiction has recast moral education as inseparable from digital life. Students who lack foundational values of empathy, honesty, and responsibility are more vulnerable to digital harms — and less capable of harnessing technology constructively. Concurrently, climate change, biodiversity loss, and plastic pollution demand not merely scientific knowledge, but the moral will to act ecologically. Thus, the interplay between character, citizenship in digital spaces, and ecological consciousness has become an urgent pedagogical concern.

Previous research has examined personality development (Erikson, 1968; Bandura, 1989), moral values education (Lickona, 1991; Noddings, 2003), and environmental education (UNESCO, 2017) in relative isolation. Fewer studies have explored how these domains interact within the lived experience of secondary school students, particularly in the context of rapidly evolving technological and ecological realities. This paper addresses that gap by presenting an integrated study that investigates character education, digital citizenship, and ecological literacy as interrelated dimensions of adolescent development.

1.1 Rationale for the Study

The rationale is threefold. First, the digital revolution has fundamentally transformed the social and moral contexts in which adolescents develop, necessitating an updated understanding of values formation. Second, the climate emergency has elevated environmental awareness from an optional curricular addition to an ethical imperative. Third, research consistently demonstrates that moral character — comprising virtues such as integrity, compassion, and responsibility — underpins both responsible digital behaviour and pro-environmental action. Examining these three constructs together offers a more complete portrait of what it means to educate secondary students for the contemporary world.

1.2 Objectives of the Study

The study is guided by the following objectives:

1. To examine the levels of character education among secondary school students.
2. To assess digital citizenship competencies across grade levels.
3. To evaluate ecological literacy and environmental attitudes.
4. To analyse the relationships among character education, digital citizenship, and ecological literacy.
5. To identify demographic variables (gender, grade level, school type) that moderate these relationships.
6. To propose an integrated curricular model for holistic student development.

1.3 Research Questions

7. What are the prevailing levels of character education, digital citizenship, and ecological literacy among secondary school students?
8. Is there a significant relationship between character education and digital citizenship?
9. Is there a significant relationship between character education and ecological literacy?
10. Do gender and grade level significantly affect these constructs?
11. How do teachers integrate (or fail to integrate) these domains in classroom practice?

1.4 Hypotheses

- H1: There is a significant positive relationship between character education and digital citizenship among secondary school students.
- H2: There is a significant positive relationship between character education and ecological literacy.
- H3: Students in higher grade levels demonstrate higher ecological literacy scores.
- H4: Female students score higher on empathy-related character dimensions than male students.

II. REVIEW OF RELATED LITERATURE

2.1 Character Education: Theoretical Foundations

Character education refers to deliberate instructional efforts to cultivate virtues, moral reasoning, and ethical behaviour in students (Lickona, 1991). Rooted in Aristotelian ethics, it posits that virtues such as honesty, courage,

compassion, and justice can be taught and habituated through experience, reflection, and community. Contemporary theorists, including Berkowitz and Bier (2005), emphasise that effective character education involves modelling, explicit instruction, cooperative learning, and the creation of a moral school community.

Kohlberg's (1984) stage theory of moral development provides a developmental scaffold, proposing that individuals progress from pre-conventional (self-interest) to conventional (social norms) to post-conventional (universal principles) reasoning. For secondary students — predominantly at the conventional stage — peer relationships and institutional norms are powerful moral influences. Schools thus bear significant responsibility not only for academic instruction but for the moral climate they cultivate.

Social Learning Theory (Bandura, 1977) highlights the role of observational learning and self-efficacy in character formation. When students observe teachers and peers demonstrating integrity, empathy, and civic responsibility, they are more likely to internalise these values. This underscores the importance of teacher modelling and positive peer culture in secondary schools.

2.2 Digital Citizenship: Navigating Online Moral Terrain

Digital citizenship encompasses the norms of appropriate, responsible technology use (Ribble, 2015). It includes nine elements: digital access, commerce, communication, literacy, etiquette, law, rights and responsibilities, health, and security. For adolescents, whose social lives are increasingly mediated by digital platforms, developing digital citizenship is integral to character formation.

Cyberbullying remains one of the most pressing issues confronting secondary students. Research by Kowalski et al. (2014) indicates that approximately 37% of adolescents report experiencing cyberbullying, with profound effects on mental health, academic performance, and social relationships. Students with stronger empathy and moral reasoning show lower rates of cyberbullying perpetration (Pornari & Wood, 2010), establishing a direct empirical link between moral character and digital conduct.

The concept of digital literacy — the ability to critically evaluate online information — has taken on new urgency in an era of misinformation and algorithmic manipulation. UNESCO (2021) argues that digital literacy must be understood not

merely as a technical skill but as a civic and moral competency. Students equipped with critical thinking, fairness, and truth-seeking dispositions are better prepared to navigate digital ecosystems responsibly.

2.3 Ecological Literacy: Moral Dimensions of Environmental Education

Ecological literacy (Orr, 1992) refers to the understanding of ecological systems, their interconnections, and the human role within them. It extends beyond scientific knowledge to encompass environmental attitudes, values, and a sense of moral obligation toward non-human life and future generations. Schultz (2001) identifies three dimensions of environmental concern: egoistic (self-interest), altruistic (other-human concern), and biospheric (concern for all living things). Cultivating the biospheric dimension requires moral development — specifically, an expansion of the circle of moral concern.

The New Ecological Paradigm (Dunlap & Van Liere, 1978; Dunlap et al., 2000) provides a widely used framework for measuring environmental worldviews, distinguishing between anthropocentric (human-centred) and ecocentric (ecosystem-centred) perspectives. Studies consistently show that ecocentric values correlate with pro-environmental behaviours, including reduced consumption, participation in environmental activism, and greater support for sustainability policies.

Krasny and Tidball (2015) argue that place-based environmental education — which connects students to local ecosystems — is particularly effective in fostering ecological literacy. When students develop emotional bonds with specific natural environments, their motivation for stewardship deepens. This resonates with care ethics (Noddings, 2003), suggesting that ecological responsibility is, at its core, an extension of caring relationships.

2.4 Integrative Perspectives: Character, Digital Life, and Ecology

Several scholars have begun to theorise the convergence of character education, digital ethics, and environmental values. Westheimer and Kahne (2004) propose a framework of 'participatory citizenship' that encompasses both online and offline civic engagement, including environmental advocacy. Johansson (2019) argues that 'sustainable digital citizenship' — characterised by responsible technology use, critical media consumption, and digital environmental awareness — represents an emerging competency for the 21st century.

The COVID-19 pandemic accelerated digitisation while simultaneously foregrounding ecological vulnerabilities, illustrating in stark relief the entanglement of digital and environmental realities. Students who followed online environmental movements such as Fridays for Future used digital platforms as tools for ecological activism, demonstrating that digital citizenship and ecological citizenship can be mutually reinforcing (Pickard, 2019).

Despite these convergences, empirical studies integrating all three domains remain scarce. Most research investigates them in pairs — moral education and environment, or digital citizenship and bullying — leaving the triadic relationship understudied. This paper contributes to filling that gap.

III. METHODOLOGY

3.1 Research Design

This study employs a concurrent mixed-methods design (Creswell & Creswell, 2018), in which quantitative survey data and qualitative interview/observation data were collected simultaneously and then integrated in the analysis. The mixed-methods approach was chosen because the complexity of character, citizenship, and ecological values resists reduction to numerical scores alone; qualitative data illuminates the meanings, contexts, and contradictions that statistics cannot capture.

3.2 Participants

A total of 320 secondary school students (grades 9–12) participated in the quantitative phase, drawn from four secondary schools in an urban district: two government schools and two private schools. Purposive sampling was used to ensure diversity across grade levels, gender, and school type. An additional 24 teachers participated in semi-structured interviews, and 8 classrooms were selected for non-participant observation over a six-week period.

Table 1. Demographic Profile of Participants (N = 320)

ariable	Category	n	Percentage
Gender	Male	156	48.75%
	Female	164	51.25%
Grade	Grade 9	82	25.63%

	Grade 10	80	25.00%
	Grade 11	79	24.69%
	Grade 12	79	24.69%
School Type	Government	160	50.00%
	Private	160	50.00%

3.3 Instruments

3.3.1 Character Education Scale (CES)

The Character Education Scale, adapted from Berkowitz and Bier (2005) and validated for the secondary school context, measures five dimensions: (1) Integrity, (2) Empathy, (3) Responsibility, (4) Respect, and (5) Perseverance. Each dimension contains 8 items rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), yielding a total of 40 items. Cronbach's alpha for the adapted scale was 0.87, indicating strong internal consistency.

3.3.2 Digital Citizenship Competency Scale (DCCS)

The DCCS, drawing on Ribble's (2015) nine-element framework and the DigComp 2.1 framework (Vuorikari et al., 2022), assesses five competency domains: (1) Digital Communication and Collaboration, (2) Digital Etiquette and Safety, (3) Critical Evaluation of Online Information, (4) Privacy and Security Awareness, and (5) Digital Empathy and Anti-Cyberbullying Disposition. The scale contains 35 items; Cronbach's alpha = 0.83.

3.3.3 Ecological Literacy Assessment (ELA)

The ELA combines a 20-item knowledge test on ecological concepts (scored 0–20) and a 25-item attitude scale based on the New Ecological Paradigm (Dunlap et al., 2000; Likert format, 1–5). The attitude subscale's Cronbach's alpha was 0.81. A composite ecological literacy score was computed by standardising and averaging the knowledge and attitude components.

3.4 Data Collection Procedures

After obtaining ethical clearance from the institutional review board and written consent from parents/guardians and student assent, instruments were administered during school hours under the supervision of trained research assistants. Teacher interviews (20–30 minutes each) were conducted in a private setting and audio-recorded with permission.

Classroom observations focused on instructional practices related to values education, digital tool use, and environmental content.

3.5 Data Analysis

Quantitative data were analysed using IBM SPSS Statistics 27. Descriptive statistics (means, standard deviations, frequencies) were computed for all variables. Pearson correlation coefficients were used to test bivariate relationships. Independent samples t-tests compared gender differences; one-way ANOVA assessed grade-level differences. Multiple regression analysis examined the predictive power of character education on digital citizenship and ecological literacy, controlling for demographic variables.

Qualitative data from interviews were transcribed verbatim and analysed using thematic analysis (Braun & Clarke, 2006): familiarisation, initial coding, theme development, review, naming, and write-up. Observational field notes were coded alongside interview transcripts to enhance credibility. Quantitative and qualitative findings were integrated in a joint display (Creswell & Creswell, 2018) to identify convergences, divergences, and complementary insights.

IV. RESULTS

4.1 Descriptive Statistics

Table 2 presents the means and standard deviations for the three main constructs and their sub-dimensions. Character education showed a moderate-to-high mean (M = 3.71, SD = 0.52), with Empathy (M = 3.89) and Respect (M = 3.84) scoring highest, and Perseverance (M = 3.48) scoring lowest. Digital Citizenship achieved a moderate mean (M = 3.53, SD = 0.58), with Digital Communication (M = 3.72) highest and Privacy Awareness (M = 3.21) lowest — suggesting students are active online communicators but lack security awareness. Ecological Literacy showed the lowest mean (M = 3.41, SD = 0.61), with environmental attitude (M = 3.58) consistently exceeding ecological knowledge (M = 3.24), indicating affective engagement exceeds cognitive understanding.

Table 2. Descriptive Statistics for Main Constructs and Sub-dimensions (N = 320)

Construct / Dimension	Mean	SD	Level
Character Education (Overall)	3.71	0.52	High

– Integrity	3.67	0.61	High
– Empathy	3.89	0.55	High
– Responsibility	3.72	0.58	High
– Respect	3.84	0.53	High
– Perseverance	3.48	0.71	Moderate
Digital Citizenship (Overall)	3.53	0.58	Moderate
– Digital Communication	3.72	0.62	High
– Digital Etiquette & Safety	3.58	0.65	Moderate
– Critical Online Evaluation	3.41	0.74	Moderate
– Privacy & Security	3.21	0.79	Moderate
– Digital Empathy	3.71	0.60	High
Ecological Literacy (Overall)	3.41	0.61	Moderate
– Ecological Knowledge	3.24	0.68	Moderate
– Environmental Attitude	3.58	0.64	High

4.2 Correlation Analysis

Pearson correlation analysis revealed significant positive relationships among the three constructs (Table 3). Character education was strongly correlated with digital citizenship ($r = 0.61$, $p < .001$) and moderately correlated with ecological literacy ($r = 0.54$, $p < .001$). Digital citizenship and ecological literacy were also significantly related ($r = 0.47$, $p < .001$). These findings support Hypotheses H1 and H2.

	1. Char. Ed.	2. Digit. Cit.	3. Ecol. Lit.
1. Character Education	—		

2. Digital Citizenship	0.61***	—	
3. Ecological Literacy	0.54***	0.47***	—

*Table 3. Pearson Correlation Matrix (N = 320). ***p < .001*

4.3 Gender Differences

Independent samples t-tests revealed that female students scored significantly higher than male students on character education overall ($t(318) = 3.24$, $p = .001$, $d = 0.36$), driven primarily by the Empathy dimension ($t(318) = 4.11$, $p < .001$, $d = 0.46$). Female students also scored higher on Digital Empathy ($t(318) = 2.87$, $p = .004$, $d = 0.32$). No significant gender differences were found in ecological literacy ($t(318) = 1.12$, $p = .26$), supporting partial acceptance of Hypothesis H4.

4.4 Grade-Level Differences

One-way ANOVA revealed significant grade-level differences for ecological literacy ($F(3, 316) = 8.42$, $p < .001$, $\eta^2 = 0.07$). Post-hoc Tukey tests indicated that Grade 11 ($M = 3.61$) and Grade 12 students ($M = 3.68$) scored significantly higher than Grade 9 ($M = 3.18$) and Grade 10 students ($M = 3.26$), consistent with Hypothesis H3. Grade-level differences in character education were non-significant ($F(3, 316) = 1.73$, $p = .16$), suggesting character development is relatively stable across secondary grades.

4.5 Regression Analysis

Multiple regression analysis (Table 4) examined character education as a predictor of digital citizenship after controlling for gender, grade, and school type. The model was significant ($F(4, 315) = 47.3$, $p < .001$, $R^2 = .38$), with character education as the strongest predictor ($\beta = 0.54$, $p < .001$). Gender ($\beta = 0.14$, $p = .01$) and school type ($\beta = 0.11$, $p = .04$) also contributed significantly. A parallel model for ecological literacy ($R^2 = .33$, $F(4, 315) = 38.7$, $p < .001$) similarly identified character education ($\beta = 0.48$, $p < .001$) and grade level ($\beta = 0.21$, $p < .001$) as significant predictors.

4.6 Qualitative Findings

Thematic analysis of teacher interviews and classroom observations yielded four overarching themes:

Theme 1: Character Education as the Moral Substrate

Teachers across all four schools identified character education — particularly

empathy and integrity — as the foundation for both responsible digital behaviour and environmental stewardship. As one Grade 11 teacher observed: 'When students genuinely care about not hurting others, it transfers to how they behave online. They think twice about sharing something cruel.' This resonates with Bandura's modelling theory and the quantitative finding of strong CE–DC correlation.

Theme 2: Fragmented Curriculum, Missed Connections

Despite theoretical convergence, teachers described significant curricular fragmentation. Values education, computer studies, and environmental science were taught by different teachers with minimal collaboration. Students rarely made explicit connections between online ethics and environmental ethics. One school counsellor noted: 'We teach empathy in social studies, then the ICT teacher deals with cyberbullying, and the science teacher does climate change. But nobody connects them.'

Theme 3: Digital Platforms as Ecological Awareness Channels

Several teachers and students described how social media — despite its risks — served as a significant conduit for ecological awareness. Students reported following environmental influencers, participating in online climate campaigns, and consuming documentary content on platforms like YouTube and Instagram. This points to the potential of digital citizenship education to serve ecological literacy goals when students are equipped with critical media skills.

Theme 4: The Role of School Environment in Shaping Values

Classroom observations revealed that the physical and relational school environment significantly influenced values expression. Schools with visible green spaces, student-led environment clubs, and teachers who modelled ethical digital use showed higher student engagement with both digital citizenship and ecological content. This aligns with the 'hidden curriculum' (Jackson, 1968) — the implicit values communicated by institutional structures and teacher behaviour.

V. DISCUSSION

5.1 The Character–Citizenship Nexus

The strong correlation between character education and digital citizenship ($r = 0.61$) reinforces the theoretical proposition that moral virtues constitute the motivational and cognitive substrate for responsible online behaviour. Empathy — one of the strongest

character sub-dimensions — is particularly salient: students who have cultivated empathic responsiveness are better equipped to recognise the emotional impact of their digital actions on others, deterring cyberbullying and promoting constructive online communication. This finding aligns with Pornari and Wood (2010) and Kowalski et al. (2014), and extends their work by demonstrating the relationship within a structured educational survey rather than incident reporting.

The finding that Privacy and Security Awareness was the weakest digital citizenship sub-dimension (M = 3.21) despite relatively high character scores suggests that while moral motivation is a necessary condition for digital citizenship, it is insufficient on its own. Students require explicit, skills-based instruction in data privacy, password security, and digital footprint management — areas where character education alone does not transfer automatically. This has direct implications for curriculum design, pointing toward the need for dedicated digital literacy instruction embedded within character education frameworks.

5.2 Character Education and Ecological Literacy

The significant relationship between character education and ecological literacy ($r = 0.54$) supports the theoretical argument that environmental stewardship is fundamentally a moral endeavour. Students with higher scores on Responsibility and Empathy demonstrated greater environmental concern, consistent with Schultz's (2001) finding that altruistic and biospheric values predict pro-environmental behaviour. The regression findings, in which character education was the strongest predictor of ecological literacy ($\beta = 0.48$), position character education as a lever for environmental education — a dimension underexplored in the environmental education literature.

The pattern whereby environmental attitude exceeded ecological knowledge across all grade levels is theoretically significant. It suggests that students' affective and moral orientation toward the environment is relatively well-developed, while their factual ecological understanding lags. This challenges purely knowledge-transmission approaches to environmental education and underscores the importance of connecting emotional, values-based engagement with rigorous ecological content.

5.3 Gender, Grade, and Developmental Trajectories

Gender differences in empathy and digital empathy, with female students scoring higher, are consistent with extensive developmental research documenting girls' earlier and stronger empathic development during adolescence (Eisenberg et al., 2006). Importantly, these differences were not observed in ecological literacy, suggesting that environmental concern is more equitably distributed across genders during secondary school — a finding with positive implications for mixed-gender environmental education programmes.

The grade-level progression in ecological literacy aligns with cognitive developmental theory: as students mature and accumulate academic knowledge, their capacity for systemic ecological thinking increases. However, the absence of corresponding grade-level increases in character education and digital citizenship challenges educators to consider how moral development can be actively cultivated across all secondary grades rather than assumed to develop naturally with age.

5.4 Curricular Fragmentation as a Structural Barrier

The qualitative finding of curricular fragmentation represents perhaps the most practically significant outcome of this study. When character education, digital literacy, and environmental education are delivered in isolation — by different teachers, in different disciplines, with different institutional champions — students cannot form the integrative moral frameworks that would allow virtues developed in one domain to transfer to another. This fragmentation is both a pedagogical and an institutional failure, requiring coordinated school-level responses.

VI. PROPOSED INTEGRATED CURRICULAR FRAMEWORK

On the basis of the study's findings, a Triadic Holistic Development Model (THDM) is proposed. The THDM positions character education as the moral core from which digital citizenship and ecological literacy radiate, while recognising that each domain also reinforces the others in a recursive cycle.

Table 5. Triadic Holistic Development Model (THDM) — Summary Framework

Component	Core Focus	Key Competencies	Integration Strategy
Character Core	Moral virtues & values	Empathy, Integrity, Responsibility,	Cross-curricular values threads; teacher

		Respect, Perseverance	modelling; school ethos
Digital Citizenship Ring	Responsible online life	Digital safety, critical evaluation, digital empathy, privacy	ICT + moral education integration; digital literacy across subjects
Ecological Literacy Ring	Environmental stewardship	Ecological knowledge, environmental attitude, biospheric values	Place-based learning; green school spaces; science-values dialogue
Connective Tissue	Cross-domain transfer	Critical thinking, civic engagement, systems thinking	Project-based learning; interdisciplinary units; community action

The THDM proposes three implementation levels. At the classroom level, teachers in all subject areas incorporate character reflection into their lessons, use digital tools in ethically mindful ways, and connect subject matter to ecological themes where appropriate. At the school level, coordinated programmes — including a school-wide character framework, digital citizenship curriculum, and green school initiative — are aligned and communicated coherently. At the community level, the school extends its reach to families and local environments, recognising that moral, digital, and ecological formation do not end at the school gate.

VII. RECOMMENDATIONS

7.1 For Educators

- Integrate character education themes (especially empathy and responsibility) explicitly into digital literacy and environmental science lessons to leverage cross-domain transfer.
- Model responsible digital behaviour and environmental stewardship in daily classroom practice; students are highly attuned to the 'hidden curriculum' of teacher behaviour.
- Use restorative dialogue practices when digital or environmental incidents arise, treating them as

teachable moments for moral reasoning rather than purely disciplinary matters.

- Collaborate across departments to identify and act on connections between values education, ICT, and science curricula.

7.2 For Curriculum Planners and School Leaders

- Develop an integrated Triadic Holistic Development curriculum strand that explicitly connects character education, digital citizenship, and ecological literacy across all secondary grades.
- Establish interdisciplinary project-based learning units — for example, a 'Digital Environmental Activism' project in which students use digital tools to investigate and communicate local ecological issues, applying both digital citizenship competencies and ecological knowledge.
- Invest in green school infrastructure (school gardens, recycling systems, nature areas) as physical instantiations of the school's ecological values, reinforcing classroom-based learning.
- Include digital citizenship and ecological literacy outcomes in teacher performance frameworks, signalling institutional commitment to holistic education.

7.3 For Policymakers

- Revise national secondary school curricula to include mandatory, assessable outcomes in digital citizenship and ecological literacy, positioned within a character education framework rather than as standalone technical subjects.
- Fund longitudinal research tracking how character education interventions in secondary school affect long-term digital behaviour and environmental action in adulthood.
- Develop national standards for digital citizenship education that are explicitly grounded in moral values, not merely technical skills.
- Provide professional development for teachers on integrated holistic education, including strategies for cross-subject collaboration and values-based teaching.

VIII. Limitations of the Study

Several limitations should be acknowledged. First, the study was conducted in a single urban district, limiting the generalisability of findings to rural, remote, or internationally diverse contexts. Second, reliance on self-report instruments introduces social desirability bias, particularly for character and ecological attitude measures. Third, the cross-sectional design precludes causal inferences: while the correlational data are consistent with the theoretical model, longitudinal designs are needed to establish directionality. Fourth, ecological literacy was assessed through a composite measure combining knowledge and attitude, which, while theoretically defensible, may obscure important distinctions between cognitive and affective dimensions. Future research should employ longitudinal designs, more diverse samples, and complementary behavioural measures.

IX. Conclusion

This study has demonstrated that character education, digital citizenship, and ecological literacy are not merely parallel educational priorities but deeply interrelated dimensions of adolescent development. Secondary school students who exhibit stronger moral character — particularly empathy, integrity, and responsibility — also demonstrate higher digital citizenship competencies and greater ecological awareness. These relationships are robust across gender and grade level, though demographic nuances point to areas requiring targeted attention.

The qualitative evidence reveals that current curricular structures, characterised by fragmentation and departmental silos, prevent students from making the integrative moral connections that would enable virtues cultivated in one domain to flourish in another. An integrated approach — exemplified by the Triadic Holistic Development Model — offers a more coherent, effective, and ethically responsive framework for secondary education.

In an era defined by digital ubiquity and ecological crisis, the education of moral, digitally responsible, and ecologically literate citizens is not a luxury but a necessity. Secondary schools are uniquely positioned to cultivate these capacities — and the findings of this study suggest that doing so in an integrated, values-grounded way produces outcomes greater than the sum of their parts. The task now is to translate this vision into curriculum, classrooms, and school cultures capable of meeting the defining challenges of our time.

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