



Social Media and Environmental Awareness: The Role of Digital Platforms in Promoting Environmental Citizenship among Rwandan Youth

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Abstract: Social media has become an important source of environmental information and a potential mechanism for strengthening ecological citizenship among young people. This role is particularly relevant in Rwanda, where the Catholic University of Rwanda (CUR) provides a practical institutional example through the ecological orientation of more than 30 hectares of university land, including environmental agriculture, ecological fruit production, and forest development aimed at carbon reduction and ecological restoration. This study examined the role of digital platforms in promoting environmental awareness and ecological citizenship among Year 3 Computer Science students at CUR. It addressed the question: To what extent does social media exposure contribute to environmental awareness, attitudes, sustainable behaviour, and ecological citizenship among Rwandan youth? The study hypothesized that frequent exposure to environmental content through social media positively influences environmental knowledge and sustainable practices. A quantitative cross-sectional design was used among 39 students, with data collected through a structured questionnaire and analyzed using descriptive statistics. Results showed that 89.7% (35/39) regularly encountered environmental content online, while 92.3% (36/39) reported increased environmental knowledge. 94.9% (37/39) demonstrated positive environmental attitudes, 97.4% (38/39) reported sustainable practices, and 97.4% (38/39) supported digital environmental activism. Moreover, 100% (39/39) recognized social media as an opportunity to strengthen youth environmental participation. The study concludes that digital platforms can significantly support environmental citizenship among Rwandan youth.

Keywords: Social Media, Environmental Awareness, Environmental Citizenship, Sustainable Behaviour, Rwandan Youth.

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1. INTRODUCTION

Environmental degradation and climate change are increasingly recognized as challenges requiring not only environmental policies and technological solutions but also changes in knowledge, attitudes, values, and everyday behaviour. Young people occupy a particularly important position in this process because they are active users of digital technologies and social media, through which environmental information, campaigns, and ecological practices are increasingly communicated. Social media can therefore become a mechanism for developing environmental awareness, social responsibility, and pro-environmental citizenship (Kaplan & Haenlein, 2010; Castells, 2010; Pabian & Pabian, 2023; Gao et al., 2026). However, exposure to environmental information does not necessarily result in sustainable behaviour. The central problematic is therefore whether digital environmental awareness can be transformed into environmental attitudes, sustainable practices, activism, and collective ecological action.

This question is particularly relevant among ICT and Computer Science students, whose academic training gives them specific competencies in digital technologies, online communication, information management, and technological innovation. The present study therefore focuses on 39 Year 3 Computer Science students at the Catholic University of Rwanda (CUR). Their intervention is important because they are not only consumers of environmental information but potentially digital environmental actors capable of creating, sharing, evaluating, and disseminating environmental content. Their digital competencies can contribute to online environmental campaigns, environmental education, community mobilization, and the development of innovative digital approaches to ecological citizenship. Research on digital participation demonstrates that technological competence can facilitate new forms of civic and collective engagement (Bennett & Segerberg, 2012; van Dijck et al., 2018; Miller et al., 2016; Pink et al., 2016).

CUR provides a particularly relevant practical environment for connecting these digital competencies with concrete environmental action. The University has made available more than 30 hectares of university land for environmental agriculture, ecological fruit production, and forest development intended to contribute to carbon reduction and ecological restoration. This institutional intervention creates an opportunity for ICT students to connect their digital knowledge with a tangible ecological project. They can potentially document environmental activities digitally, develop awareness campaigns, disseminate ecological knowledge, mobilize peers and communities, and promote sustainable practices. The study consequently examines

whether social media can serve as a bridge between the digital competencies of ICT students, CUR's practical ecological intervention, and the development of environmental citizenship among Rwandan youth.

2. METHODOLOGY

This study employed a mixed-methods cross-sectional design, combining quantitative and qualitative approaches to examine the role of social media in promoting environmental awareness and ecological citizenship among young people at the Catholic University of Rwanda (CUR). The study focused on Year 3 Computer Science students, whose ICT competencies make them particularly relevant to examining digital environmental communication, online participation, and the translation of environmental information into sustainable practices. Mixed-methods research allows quantitative patterns to be complemented by participants' experiences and interpretations (Creswell & Creswell, 2018; Bryman, 2016).

The target population consisted of 39 Year 3 Computer Science students. All 39 students participated in the questionnaire, representing a census of the accessible study population. In addition, four students were purposively selected for semi-structured interviews to obtain deeper qualitative information concerning their experiences with environmental content on social media, perceptions of its credibility, influence on environmental attitudes, and participation in sustainable activities and digital environmental campaigns. Purposive selection was used to obtain students who could provide relevant and detailed information (Patton, 2015).

Quantitative data were collected using a structured questionnaire covering social-media exposure, environmental knowledge, environmental attitudes and values, sustainable behaviour, digital environmental activism, and challenges and opportunities of social media. The questionnaire data were analyzed using frequencies and percentages and presented in graphs. Qualitative data from the four interviews were analyzed thematically, identifying recurring themes related to digital environmental learning, ecological responsibility, online activism, and the relationship between online awareness and offline behaviour.

Ethical principles of voluntary participation, informed consent, confidentiality, and anonymity were respected throughout the study (Creswell & Creswell, 2018). The study has limitations, particularly its small, single-institution sample, which limits generalization to Rwandan youth. The cross-sectional design cannot establish causality, while self-reported questionnaire responses may involve social-desirability bias. The four interviews provide depth but cannot represent all students' experiences. Future research

should use larger samples, multiple universities, longitudinal designs, and broader qualitative participation.

3. SOCIAL MEDIA AND ENVIRONMENTAL AWARENESS

Environmental degradation and climate change increasingly require young people to move from awareness to sustainable action. Social media provides important opportunities for accessing environmental knowledge, shaping attitudes and ecological values, encouraging sustainable behaviour, and supporting digital environmental activism and ecological citizenship. However, challenges such as misinformation, digital inequality, and passive online engagement may limit this potential. In Rwanda, the Catholic University of Rwanda (CUR) offers a relevant context through its more than 30 hectares of land dedicated to environmental agriculture, ecological fruit production, and forest development. Focusing on 39 Year 3 Computer Science students, this study examines social media as a source of environmental knowledge, its influence on environmental attitudes and values, the translation of online awareness into offline behaviour, digital environmental activism, and the challenges and opportunities of social media for strengthening youth ecological citizenship.

3.1. Social Media Use and Environmental Awareness among Rwandan Youth

Social media has become an important component of young people's everyday communication, information seeking, social interaction, and knowledge production. From a sociological perspective, digital platforms create networked spaces where individuals exchange information, construct identities, negotiate social norms, and participate in collective issues (Castells, 2010; boyd, 2014). From an anthropological perspective, these platforms can also be understood as cultural spaces in which meanings, values, and practices are continuously produced through interaction (Miller et al., 2016). In environmental communication, social media increasingly provides opportunities for young people to encounter information about climate change, pollution, biodiversity, waste management, and conservation. Previous research indicates that social-network use can contribute to climate-change awareness and environmental engagement, although its influence varies according to the platform, type of content, and users' existing interests (Manca et al., 2023; Rousseau, 2024). In the present study, 89.7% (35/39) of the respondents reported regular use of social media for environmental information. This finding suggests that digital platforms constitute an important part of the environmental information environment of university students.

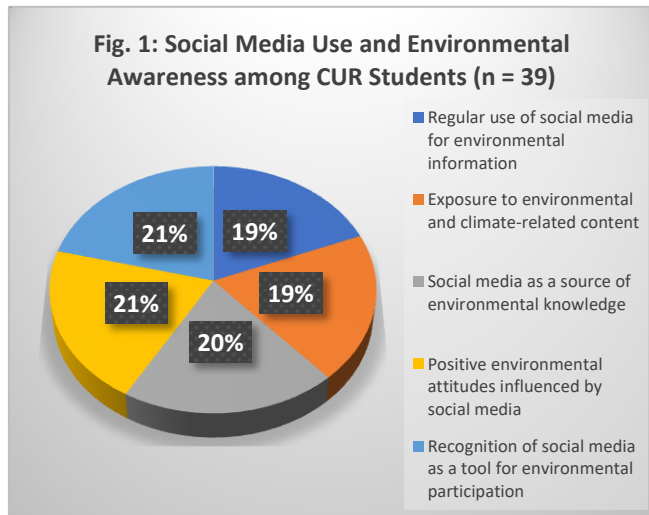
The patterns of social media use among the respondents indicate that these platforms are not limited to entertainment and interpersonal communication but also function as spaces

for environmental learning and social participation. Young people may encounter environmental information while deliberately searching for it or incidentally while using social media for other purposes. Such incidental exposure can contribute to online climate engagement, particularly when environmental messages are visually attractive, emotionally engaging, or shared within peer networks (Rousseau, 2024). From the perspective of digital sociology, these interactions demonstrate how communication technologies can facilitate new forms of social participation and collective awareness (Castells, 2010). Similarly, anthropological approaches emphasize that digital practices are embedded within everyday cultural and social relationships rather than existing separately from offline life (Miller et al., 2016). The finding that 35 out of 39 students (89.7%) regularly use social media for environmental information therefore indicates a relatively strong integration of environmental issues into their digital lives.

The type of platform also influences how environmental information is encountered, interpreted, and shared. Video-oriented platforms can make environmental issues more accessible through images, documentaries, short videos, and testimonies, while messaging and networking platforms facilitate interpersonal communication and rapid circulation of information. Research has found significant relationships between the use of platforms such as YouTube, Instagram, Twitter/X, and WhatsApp and climate-change awareness (Manca et al., 2023). Environmental organizations, universities, government institutions, influencers, and peer networks can therefore become important sources of environmental information. From an ICT perspective, the interactive characteristics of digital platforms transform young people from passive recipients into users who can search, comment, share, create, and redistribute environmental content (Kaplan & Haenlein, 2010). In sociological terms, this creates networked forms of environmental communication, while anthropologically it facilitates the circulation and negotiation of environmental meanings within digital communities (Miller et al., 2016; Castells, 2010).

The level of exposure to environmental and climate-related content was also considerable among the respondents. 92.3% (36/39) reported that social media increased their environmental knowledge. This result indicates that digital platforms may contribute to informal environmental education beyond the classroom. Environmental information encountered online can introduce young people to issues such as climate change, pollution, deforestation, biodiversity loss, sustainable agriculture, waste management, and ecological restoration. Such exposure is particularly relevant to the Rwandan context, where environmental sustainability is increasingly connected to national development and community practices. The ecological orientation of CUR

itself provides a practical institutional context through its more than 30 hectares of university land, including environmental agriculture, ecological fruit production, and forest development aimed at carbon reduction and ecological restoration. Consequently, students can potentially connect environmental information encountered online with visible institutional environmental practices. Nevertheless, environmental awareness is also influenced by the credibility of information sources, social norms, previous knowledge, and personal values (Dunlap & Catton, 1979; Rousseau, 2024).



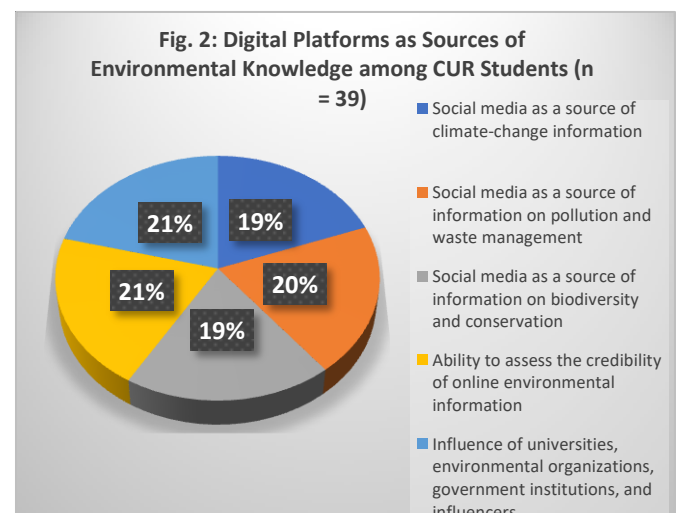
The results presented in graph 1 demonstrate a generally high level of digital environmental awareness among the 39 respondents. 89.7% (35/39) regularly used social media for environmental information, increasing to 92.3% (36/39) for exposure to environmental and climate-related content. Furthermore, 94.9% (37/39) considered social media an important source of environmental knowledge, while 97.4% (38/39) demonstrated positive environmental attitudes associated with digital environmental information. Most notably, 100% (39/39) recognized social media as a potential tool for strengthening environmental participation. The progression across the five categories suggests that social media exposure may be associated with increasingly positive environmental orientations. However, the findings should be interpreted cautiously because the study is based on a small, purposive group of Year 3 Computer Science students and uses self-reported data. The results therefore demonstrate patterns of association and perception rather than causal relationships.

From a social-environmental perspective, these findings indicate that social media can function as an important bridge between environmental knowledge and ecological citizenship. Digital platforms provide young people with opportunities not only to receive environmental information but also to discuss environmental problems, exchange experiences, support campaigns, and participate in collective action. Research on young people's sustainability

conversations shows that social media can become a space where environmental values, arguments, and interpretations are negotiated (Andersson & Öhman, 2017). Similarly, recent research indicates that social-media environmental engagement can contribute to pro-environmental citizenship among university students through motivational and normative processes (Gao et al., 2026). The CUR findings therefore support the argument that digital platforms have significant potential for environmental education and youth participation. However, the subsequent question is whether this high level of digital awareness is translated into consistent offline sustainable behaviour, which constitutes an important dimension of the knowledge–attitude–behaviour relationship examined in the following section.

3.2. Digital Platforms as Sources of Environmental Knowledge

Digital platforms have increasingly transformed the ways in which young people obtain, exchange, interpret, and share environmental knowledge. Social media provides students with rapid access to information on climate change, pollution, waste management, biodiversity, conservation, and sustainable development through videos, posts, institutional pages, online discussions, and peer networks. From an ICT perspective, the interactive nature of digital platforms allows users to become both consumers and producers of information (Kaplan & Haenlein, 2010; van Dijck et al., 2018). From a sociological perspective, environmental knowledge is increasingly produced and circulated through networked social relationships (Castells, 2010; Dunlap & Catton, 1979; Hakizimana, L., 2026). Anthropologically, digital platforms constitute cultural spaces where environmental meanings, values, and practices are negotiated and transmitted (Miller et al., 2016; Pink et al., 2016). In the present study, the importance of these platforms is reflected in the responses of the 39 Year 3 Computer Science students at CUR, particularly as 92.3% (36/39) reported obtaining information about climate change through social media.



The findings indicate that social media serves as an important channel through which students encounter information about different dimensions of the environment. 92.3% (36/39) reported using social media to obtain information about climate change, demonstrating the relevance of digital communication to contemporary environmental education. Climate-related content can include information about global warming, extreme weather events, carbon emissions, adaptation, mitigation, and individual responses to climate change. Similarly, 94.9% (37/39) reported obtaining information about pollution and waste management through digital platforms. This is particularly significant because waste management and pollution are environmental issues that can be communicated through practical videos, public-awareness campaigns, photographs, institutional announcements, and community initiatives. Social media therefore allows environmental information to circulate rapidly beyond formal educational settings. Research on social media and sustainability has shown that digital platforms can support the acquisition and dissemination of sustainability-related knowledge among young people (Pabian & Pabian, 2023). From a sociological perspective, this process demonstrates how environmental knowledge becomes embedded in everyday social communication, while from an anthropological perspective, digital media facilitate the circulation of environmental meanings across communities and social networks (Miller et al., 2016).

Biodiversity and conservation also constitute important areas of digital environmental communication. In this study, 92.3% (36/39) indicated that social media provides information about biodiversity and conservation. Through photographs, videos, documentaries, campaigns, and educational messages, students can learn about forests, wildlife, ecosystems, species protection, ecological restoration, and sustainable resource use. Such information can connect global environmental concerns with local experiences. In Rwanda, this is particularly relevant because environmental conservation is closely connected to land management, forest development, biodiversity protection, and sustainable agriculture. The ecological orientation of CUR provides a practical institutional context for students to relate online environmental information to real-world practices, particularly through its more than 30 hectares of university land, including environmental agriculture, ecological fruit production, and forest development intended to contribute to carbon reduction and ecological restoration. Digital communication can therefore reinforce formal university-based environmental education by connecting students' online experiences with visible ecological practices. However, access to information should not automatically be equated with accurate knowledge. Environmental sociology emphasizes that environmental understanding is influenced by social institutions, cultural

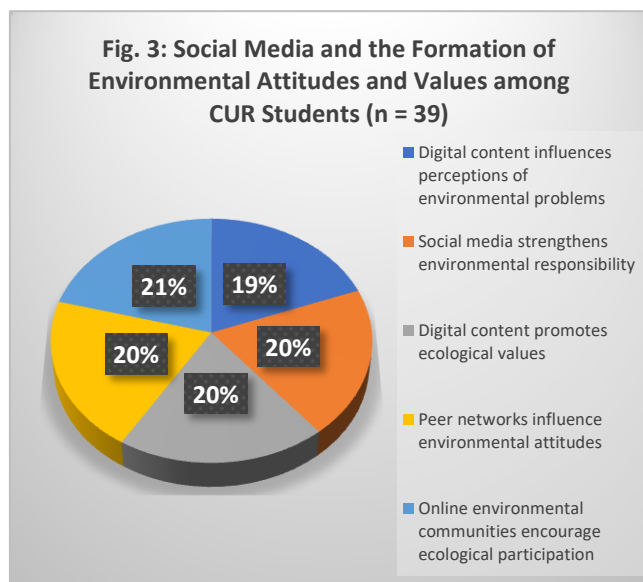
values, and patterns of communication (Dunlap & Catton, 1979; Hannigan, 2014).

The credibility and reliability of online environmental information represent another important dimension. Although digital platforms provide abundant environmental information, users must distinguish between scientifically supported information, personal opinions, commercial messages, misinformation, and disinformation. In the present study, 97.4% (38/39) reported an ability to assess the credibility of online environmental information. This high proportion suggests that most respondents perceive themselves as capable of evaluating the information they encounter. Nevertheless, digital literacy remains essential because environmental misinformation can influence attitudes and behaviour. Research on students' evaluation of climate information indicates that source characteristics, evidence, plausibility, and perceived expertise influence judgments of credibility (Kresin et al., 2024; Zilz & Höttecke, 2025). From an ICT perspective, therefore, access to digital information must be accompanied by information-literacy skills. From a sociological perspective, credibility is also socially constructed through trust in institutions, experts, peers, and communicators (Castells, 2010). Anthropological approaches further suggest that users interpret information through existing cultural experiences and social relationships (Pink et al., 2016).

The final dimension concerns the influence of information providers, including universities, environmental organizations, government institutions, and social-media influencers. Remarkably, 100% (39/39) of the respondents recognized the influence of these actors on environmental information and participation. Universities can provide scientifically grounded knowledge and connect research with environmental practice, while government institutions can communicate policies, regulations, and national environmental priorities. Environmental organizations can mobilize communities through campaigns and advocacy, whereas influencers can make environmental messages more accessible and attractive to younger audiences. However, the credibility of these actors may differ. Research suggests that institutional and scientific sources are often perceived as more trustworthy, while influencers can have considerable persuasive power because of their perceived similarity and relationship with followers (Dekoninck & Schmuck, 2025; Banász et al., 2026). For CUR, this finding presents an important opportunity to strengthen its digital environmental communication by using its own ecological activities as practical educational content. Overall, the results suggest that digital platforms constitute a significant source of environmental knowledge for Rwandan youth, while their effectiveness depends on the quality, credibility, accessibility, and social influence of the information provided.

3.3. Social Media and the Formation of Environmental Attitudes and Values

Digital platforms increasingly shape how young people perceive environmental problems, interpret ecological risks, and develop attitudes toward environmental responsibility. Social media does not simply transmit environmental information; it frames environmental issues through images, narratives, personal testimonies, videos, hashtags, and discussions that can influence how users understand climate change, pollution, biodiversity loss, and conservation. From an ICT perspective, the interactive architecture of social media enables users to receive, comment on, reproduce, and redistribute environmental messages (Kaplan & Haenlein, 2010; van Dijck et al., 2018). Sociologically, these processes contribute to the construction of shared environmental meanings and norms within networked communities (Castells, 2010; Dunlap & Catton, 1979; Hakizimana, L., et.al. 2025). Anthropologically, digital spaces constitute environments in which ecological values and identities are negotiated through everyday communication and cultural interaction (Miller et al., 2016; Pink et al., 2016). Recent research similarly demonstrates that social-media exposure can shape environmental attitudes and intentions toward pro-environmental action. In the present study, 94.9% (37/39) of respondents demonstrated positive environmental attitudes, suggesting a strong orientation toward environmental responsibility among the participating CUR students.



The first important dimension concerns how digital content shapes environmental perceptions. Environmental messages encountered online can make distant ecological problems more visible and personally meaningful. Images of environmental degradation, stories of affected communities, explanations of climate change, and demonstrations of sustainable practices can influence perceptions of environmental urgency and individual responsibility. In this

study, 92.3% (36/39) of respondents indicated that digital content influenced their perceptions of environmental problems. This finding is consistent with research showing that social networking sites can shape societal perceptions of climate change and stimulate ecological concern and pro-environmental responses (Ali et al., 2021). Social-media communication may therefore transform environmental issues from abstract scientific concerns into everyday social experiences. From a sociological perspective, repeated exposure can contribute to the normalization of environmental responsibility within peer groups (Castells, 2010; Hannigan, 2014). From an anthropological perspective, digital narratives also allow young people to interpret environmental issues through culturally meaningful images, experiences, and identities (Miller et al., 2016; Pink et al., 2016).

The second dimension concerns the development of environmental responsibility and ecological values. Environmental responsibility involves recognizing that individuals and communities have obligations toward the natural environment, while ecological values encompass respect for nature, conservation, sustainability, intergenerational responsibility, and concern for ecological well-being. In the CUR sample, 94.9% (37/39) reported that social media strengthened their sense of environmental responsibility, while the same proportion 94.9%, (37/39) indicated that digital content promoted ecological values. These findings suggest that environmental communication may contribute not only to knowledge acquisition but also to value formation. Recent research shows that social-media environmental engagement among university students can influence pro-environmental citizenship through intrinsic environmental motivation and personal accountability. Similarly, research on social-media green communities demonstrates that browsing environmental communities can increase participation and environmental concern, which subsequently relate to pro-environmental behaviour. The findings therefore support the interpretation that digital communication can become a mechanism through which environmental knowledge is gradually transformed into ecological values and personal responsibility.

The third dimension is the influence of peer networks and online environmental communities. Young people rarely develop attitudes in isolation; rather, their opinions are influenced by friends, classmates, family members, influencers, and online communities. In the present study, 97.4% (38/39) reported that peer networks influenced their environmental attitudes, while 100% (39/39) recognized online environmental communities as encouraging ecological participation. These findings demonstrate the importance of social interaction in the formation of environmental values. Online communities provide spaces for sharing experiences, receiving social approval, observing

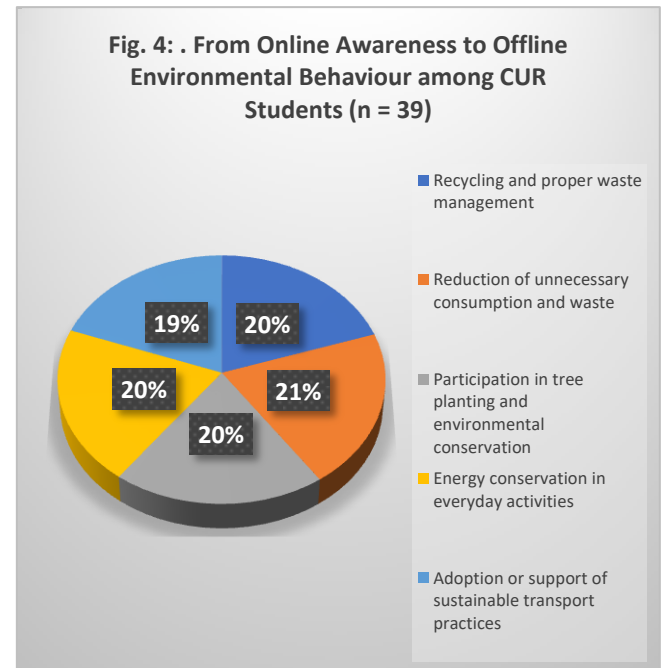
sustainable practices, and participating in environmental campaigns. Research shows that interpersonal influence on social media can shape pro-environmental attitudes and subjective norms, particularly because peer relationships may involve high levels of trust (Liao, 2024). Likewise, research on green social-media communities found that community participation and environmental concern mediate the relationship between online engagement and pro-environmental behaviour. Thus, peer networks can reinforce ecological norms by making environmentally responsible behaviour socially visible and collectively valued.

The overall pattern indicates a strong relationship between digital engagement, environmental attitudes, and ecological values among the respondents. The progression from 92.3% (36/39) reporting an influence of digital content on environmental perceptions to 94.9% (37/39) reporting strengthened responsibility and ecological values, 97.4% (38/39) identifying peer influence, and 100% (39/39) recognizing the role of online communities suggests that environmental attitudes are embedded within a broader process of digital socialization. Nevertheless, the cross-sectional nature of the study means that these findings demonstrate perceived associations rather than causal effects. Social media may strengthen existing environmental orientations as much as it creates new ones. Recent research confirms that social networks can influence pro-environmental behaviour through environmental perceptions and social learning mechanisms. In the Rwandan context, universities such as CUR can therefore use digital platforms to reinforce ecological values by connecting online communication with practical environmental initiatives, including environmental agriculture, ecological fruit production, forest development, and carbon-reduction activities on the university's more than 30 hectares of land.

3.4. From Online Awareness to Offline Environmental Behaviour

The growing use of social media for environmental communication raises an important question: does online environmental awareness translate into concrete sustainable behaviour? Social media can expose young people to information about recycling, waste reduction, tree planting, energy conservation, sustainable transport, and environmental campaigns, but awareness alone does not necessarily produce behavioural change. From an ICT perspective, digital platforms facilitate rapid communication, interaction, and behavioural modelling (Kaplan & Haenlein, 2010; van Dijck et al., 2018). Sociologically, environmental behaviour is also influenced by social norms, institutions, peer expectations, and available opportunities for action (Dunlap & Catton, 1979; Hannigan, 2014). Anthropological approaches emphasize that sustainable practices are embedded in everyday cultural

routines and community relationships (Miller et al., 2016; Pink et al., 2016). Recent empirical research provides evidence that environmental information exposure through social media can increase pro-environmental attitudes and behavioural intentions, while green online communities can facilitate offline environmental behaviour through participation and environmental concern. In the present study, 97.4% (38/39) of respondents reported engaging in sustainable practices, suggesting a strong relationship between digital environmental awareness and reported offline behaviour.



The findings indicate that online environmental awareness is accompanied by a high level of reported sustainable practices. 94.9% (37/39) of respondents reported engaging in recycling and proper waste management, demonstrating that environmental information can be associated with practical household and institutional behaviours. Similarly, 97.4% (38/39) reported reducing unnecessary consumption and waste. These practices are important because they represent relatively accessible forms of individual environmental action that can be incorporated into everyday routines. Research by Meng, Chung, and Zhang (2023) found that exposure to environmental information through social media positively affected young adults' intention to participate in activities including recycling, public transportation, environmental groups, and ecological events. Likewise, Shen et al. (2023), using data from 585 members of green social-media communities, found that browsing such communities was positively related to pro-environmental behaviour, partly through participation and environmental concern. These findings suggest that digital information can become behaviourally meaningful when it is connected to personal concern and opportunities for practical action. From an anthropological perspective,

repeated sustainable practices can gradually become normalized within everyday social life, while sociologically they can become reinforced through collective expectations and social norms.

Tree planting and conservation constitute another important form of offline environmental behaviour. In this study, 94.9% (37/39) reported participation in or support for tree planting and environmental conservation. This finding is particularly relevant in the context of CUR, where more than 30 hectares of university land are oriented toward environmental agriculture, ecological fruit production, and forest development intended to contribute to carbon reduction and ecological restoration. The university environment can therefore provide students with opportunities to connect digital environmental messages with direct ecological experiences. Social learning theory suggests that individuals can acquire behavioural orientations by observing and interacting with others, including through digital communities (Bandura, 1977; Shen et al., 2023; Hakizimana, L. et. al., 2026). Contemporary research also indicates that social-media environmental engagement can influence university students' offline pro-environmental citizenship through intrinsic environmental motivation and personal accountability. Thus, digital communication may be most effective when environmental awareness is supported by concrete institutional and community opportunities for participation.

Energy conservation and sustainable transport provide further evidence of the relationship between online awareness and everyday behaviour. 97.4% (38/39) of respondents reported energy-conservation practices, while 92.3% (36/39) reported adopting or supporting sustainable transport practices. These may include reducing unnecessary electricity consumption, using energy-efficient practices, walking, cycling, carpooling, or using public transportation where available. However, transport and energy practices can be more structurally constrained than behaviours such as recycling because they depend on infrastructure, affordability, accessibility, and institutional arrangements. Consequently, social media may encourage intentions without always providing the material conditions necessary for implementation. Recent research on Generation Z found that exposure to pro-environmental social-media campaigns can strengthen environmental commitment and sustainable-action intentions, particularly when environmental knowledge and responsibility are high. This demonstrates the importance of distinguishing between awareness, intention, and actual behaviour.

The findings nevertheless suggest a relatively small knowledge–attitude–behaviour gap. While 92.3% (36/39) reported increased environmental knowledge, 94.9% (37/39) demonstrated positive environmental attitudes and 97.4%

(38/39) reported sustainable practices. Rather than showing a conventional decline from knowledge to behaviour, the present results show a high level of reported behavioural engagement. However, this should not be interpreted as proof that social media directly caused the behaviour. The study is cross-sectional, based on only 39 students, and relies on self-reported practices. Recent research emphasizes that online engagement can translate into offline action through motivational and normative mechanisms, but the process is not automatic. There may also be a distinction between low-cost actions, such as switching off lights, and more demanding behaviours, such as changing transport habits or sustained participation in environmental organizations. The findings therefore suggest that social media can serve as an important bridge between environmental awareness and ecological practice, especially when digital messages are reinforced by peer networks, university initiatives, and accessible opportunities for environmental action.

3.5. Digital Environmental Activism and Ecological Citizenship

Digital environmental activism has become an increasingly important dimension of youth participation in environmental governance and collective action. Social media enables young people not only to receive environmental information but also to create campaigns, advocate for environmental causes, organize discussions, circulate petitions, and mobilize communities. From an ICT perspective, the interactive and networked character of digital platforms reduces communication barriers and enables rapid coordination among geographically dispersed users (Kaplan & Haenlein, 2010; van Dijk et al., 2018, Hakizimana, L, et al., 2024)). Sociologically, these practices represent new forms of collective and connective action in which individuals can participate without necessarily belonging to formal organizations (Castells, 2010; Bennett & Segerberg, 2012). Anthropologically, digital activism can contribute to the formation of shared identities, values, and meanings around ecological responsibility (Miller et al., 2016; Pink et al., 2016). Recent research confirms that social media can facilitate local climate mobilization and collective action, although the effects depend on how messages are framed and how audiences are engaged. In the present study, 97.4% (38/39) of respondents reported supporting digital environmental activism, indicating a strong orientation toward online ecological participation.



Online campaigns provide one of the most accessible forms of digital environmental activism among young people. Through hashtags, videos, infographics, petitions, awareness messages, and campaign pages, young people can communicate environmental concerns to large audiences at relatively low cost. In the present study, 92.3% (36/39) of respondents reported participating in or supporting online environmental campaigns, while 94.9% (37/39) reported sharing or supporting environmental advocacy messages. These findings suggest that environmental activism can take relatively low-threshold forms, such as sharing information, signing petitions, commenting on environmental issues, or encouraging others to participate. Research on youth climate movements demonstrates that social media can help young activists build online communities and direct followers toward collective action. Similarly, research on young people's environmental activism in Chile found a positive relationship between social-media use and participation in environmental issues, although this relationship varied according to the stage of the protest cycle. From a sociological perspective, therefore, digital campaigns can transform individual concerns into visible collective claims, while anthropological perspectives emphasize how repeated participation can contribute to shared ecological identities and norms (Castells, 2010; Miller et al., 2016; Bennett & Segerberg, 2012; Pink et al., 2016).

Digital environmental activism also involves discussion and community mobilization. Environmental discussions on social media allow young people to exchange opinions, ask questions, debate environmental policies, share local experiences, and encourage others to act. In the present study, 97.4% (38/39) reported participating in online environmental discussions, while the same proportion 97.4% (38/39) recognized the role of digital networks in mobilizing people for environmental initiatives. This finding is consistent with research showing that youth climate activists use social media to construct networked publics, develop collective identities, and organize around

environmental causes. Digital communities can therefore operate as informal spaces of environmental education and political socialization. Recent research on youth-led climate groups similarly shows that peer interaction and collective meaning-making can transform environmental concern into purposeful individual and collective action. From an ICT perspective, network connectivity facilitates rapid mobilization, while sociologically these networks can generate solidarity, shared norms, and collective efficacy (Castells, 2010; van Dijck et al., 2018; Bennett & Segerberg, 2012; Dunlap & Catton, 1979).

Youth participation through digital platforms can consequently contribute to the development of ecological citizenship. Ecological citizenship extends beyond individual environmentally friendly behaviour by emphasizing responsibilities toward other people, communities, future generations, and the natural environment. In this study, 100% (39/39) of respondents recognized social media as a mechanism for strengthening ecological citizenship and collective environmental action. This finding is important because environmental citizenship involves not only private consumption choices but also participation in public discussions, advocacy, community initiatives, and demands for institutional responsibility. Research on the Fridays for Future movement demonstrates how young people use digital communication to express environmental citizenship and collective demands for political action. Recent research also shows that youth climate activism can occupy citizenship space in multiple ways, including advocacy, community action, education, and demands for governmental and corporate accountability. Thus, social media can provide young people with a space to enact citizenship even when conventional political participation is limited.

The findings also indicate that digital environmental activism should be understood as a continuum from low-effort online participation to more demanding collective action. Liking, sharing, commenting, or signing a petition may represent an initial level of engagement, whereas organizing campaigns, participating in community environmental projects, communicating with decision-makers, and joining environmental organizations represent deeper forms of ecological citizenship. Research on green influencers indicates that engagement with environmental content can be associated with both low- and high-effort forms of environmental activism, although the relationship is influenced by environmental knowledge and the nature of the online relationship. Moreover, not all digital activism produces positive outcomes: research published in 2026 found that exposure to radical environmental influencers could increase perceived polarization and reduce intentions for collective environmental action among young adults. This suggests that the quality, credibility, inclusiveness, and

tone of digital environmental communication are crucial. In the CUR context, the strong findings—97.4% (38/39) supporting digital activism and 100% (39/39) recognizing its potential for ecological citizenship—indicate that the university could strategically connect its online environmental communication with practical initiatives such as tree planting, ecological agriculture, forest development, waste management, and community environmental campaigns. Social media can therefore function not merely as an information channel but as a bridge between environmental awareness, civic identity, and collective ecological action.

3.6. Challenges and Opportunities of Social Media for Environmental Citizenship

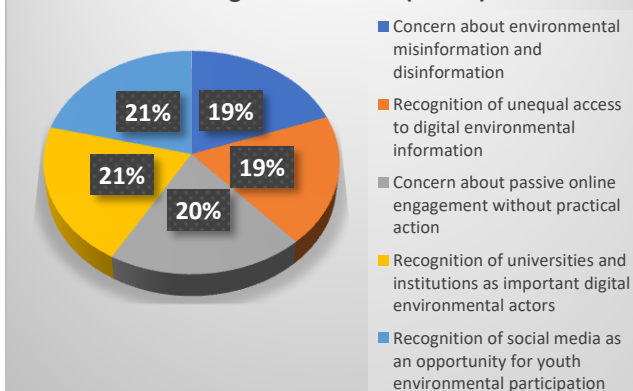
Although social media offers considerable opportunities for strengthening environmental citizenship, its contribution is not automatically positive. Digital platforms can expand access to environmental information, facilitate communication, and support collective action, but they can also reproduce misinformation, inequalities, and forms of passive participation. From an ICT perspective, the same connectivity that enables rapid dissemination of reliable environmental information can also accelerate the circulation of false or misleading claims (Kaplan & Haenlein, 2010; van Dijck et al., 2018). Sociologically, digital participation is shaped by unequal access to technological resources, education, and social networks (Castells, 2010; Dunlap & Catton, 1979, Hakizimana, L, et. al. 2024). Anthropological approaches further emphasize that users interpret digital information through their cultural contexts and everyday experiences (Miller et al., 2016; Pink et al., 2016). In the present study, however, respondents generally perceived social media positively: 97.4% (38/39) supported digital environmental activism and 100% (39/39) recognized social media as an opportunity for strengthening youth environmental participation. These results demonstrate both the potential of digital platforms and the need to address their limitations.

One of the principal challenges is the circulation of misinformation and environmental disinformation. Social media allows environmental claims to spread rapidly, regardless of whether they are scientifically verified. Climate-change denial, misleading claims about pollution, exaggerated environmental risks, and inaccurate sustainability advice can confuse users and undermine trust in scientific knowledge. In the present study, 92.3% (36/39) of respondents recognized misinformation and disinformation as an important challenge. This finding is significant because environmental citizenship requires not only access to information but also the ability to distinguish credible knowledge from unreliable content. Research on social media demonstrates that digital environments can facilitate both information sharing and the rapid circulation of misleading information (Vosoughi et al., 2018; Zilz & Höttecke, 2025). From a sociological perspective, trust in scientific and institutional sources is central to the construction of environmental knowledge (Hannigan, 2014; Dunlap & Catton, 1979). Consequently, universities and environmental institutions should strengthen digital environmental literacy, enabling students to verify sources, identify scientific evidence, and critically evaluate environmental claims.

A second challenge concerns digital inequality. Although social media has become widespread among young people, access to smartphones, reliable internet, affordable data, digital skills, and high-quality environmental information is not equally distributed. In this study, 89.7% (35/39) recognized unequal access to digital environmental information as a potential challenge. Digital inequality can create differences between young people who can regularly access environmental information and those who cannot. Castells (2010) argues that participation in network societies is strongly influenced by access to communication technologies and networks, while van Dijk (2020) emphasizes that the digital divide extends beyond physical access to include differences in skills and meaningful use. From an anthropological perspective, technology adoption is also shaped by social context, economic conditions, and everyday cultural practices (Miller et al., 2016; Pink et al., 2016). Therefore, using social media to promote environmental citizenship should not replace traditional educational and community-based approaches. Universities, government agencies, and NGOs should combine digital communication with face-to-face environmental education and community activities to ensure broader inclusion.

A third challenge is passive digital engagement, sometimes described as “clicktivism.” Users may like, share, comment on, or watch environmental content without translating these activities into meaningful environmental behaviour. In the present study, 94.9% (37/39) identified passive engagement as a potential limitation of social-media environmental

Fig. 6: Challenges and Opportunities of Social Media for Environmental Citizenship among CUR Students (n = 39)



activism. This is important because high levels of online participation do not necessarily indicate high levels of ecological citizenship. Bennett and Segerberg (2012) distinguish between different forms of digitally enabled participation, while research on environmental social-media communities indicates that online engagement is more likely to produce behavioural outcomes when it is accompanied by participation, environmental concern, and social interaction (Shen et al., 2023). From an environmental-sociological perspective, ecological citizenship requires movement from individual awareness toward sustained responsibility and collective action (Hannigan, 2014; Dobson, 2003). Therefore, the effectiveness of environmental social media should be assessed not simply by the number of likes, views, or shares but by whether digital engagement produces measurable offline outcomes.

Despite these challenges, social media provides substantial opportunities for universities, government institutions, NGOs, and environmental organizations to strengthen youth environmental participation. In this study, 97.4% (38/39) recognized universities and other institutions as important actors in digital environmental communication, while 100% (39/39) recognized social media as an opportunity for strengthening youth environmental participation. Universities can use social media to disseminate research findings, promote environmental campaigns, organize online discussions, publicize tree-planting activities, and connect students with community initiatives. Government institutions can communicate environmental policies and national priorities, while NGOs can mobilize young people around conservation, waste management, climate action, and biodiversity protection. Social-media campaigns can also connect online participation with concrete offline activities, thereby reducing the knowledge–attitude–behaviour gap (Meng et al., 2023; Shreedhar et al., 2026). In the case of CUR, the university can use its more than 30 hectares of ecologically oriented land as a practical platform for digital environmental education, documenting environmental agriculture, ecological fruit production, forest development, and carbon-reduction initiatives and encouraging students to participate directly.

Overall, the findings demonstrate that social media presents a dual reality for environmental citizenship. It can increase access to environmental knowledge, strengthen ecological values, facilitate youth mobilization, and create opportunities for collective action, but misinformation, digital inequality, and passive engagement can limit its effectiveness. The high proportion of respondents recognizing the opportunities of social media 100%, (39/39) suggests considerable potential among CUR students. The most effective strategy is therefore not simply to increase environmental content online but to develop credible, inclusive, interactive, and action-oriented digital

environmental communication. Social media should function as a bridge connecting environmental knowledge with institutional support, community participation, and measurable ecological action.

CONCLUSION AND RECOMMENDATIONS

This study examined the role of social media in promoting environmental citizenship among 39 Year 3 Computer Science students at the Catholic University of Rwanda (CUR). The findings demonstrate a strong association between digital environmental engagement, environmental knowledge, ecological attitudes, sustainable practices, and environmental activism. 89.7% (35/39) regularly encountered environmental content online, 92.3% (36/39) reported increased environmental knowledge, 94.9% (37/39) demonstrated positive environmental attitudes, and 97.4% (38/39) reported sustainable practices. Furthermore, 97.4% (38/39) supported digital environmental activism, while 100% (39/39) recognized social media as an opportunity to strengthen youth environmental participation. These findings indicate that digital platforms can contribute significantly to the development of environmental citizenship, although online awareness should be continuously connected with concrete offline action. The particular involvement of Computer Science students is important because their digital competencies can support environmental communication, innovation, information dissemination, and community mobilization. CUR's provision of more than 30 hectares of university land for environmental agriculture, ecological fruit production, and forest development provides a practical setting for connecting digital knowledge with ecological action.

CUR should integrate digital environmental citizenship into student activities, particularly through ICT and Computer Science programmes, encouraging students to develop environmental campaigns, educational content, and digital mobilization initiatives. The University should use its more than 30 hectares of ecological activities as a living laboratory, enabling students to document and communicate sustainable practices through social media. Digital environmental literacy should also be strengthened to help students identify misinformation and assess the credibility of online sources. CUR should further establish partnerships with government institutions, NGOs, environmental organizations, and technology actors to expand youth-oriented environmental campaigns. Finally, future studies should involve larger and more diverse samples and combine quantitative and qualitative methods to assess whether online environmental engagement produces sustained offline ecological behaviour.

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