

COMMUNICATION FOR THE CIRCULAR ECONOMY: EMPIRICAL EVIDENCE FROM A STUDY APPLIED TO STUDENTS IN ECONOMIC ENGINEERING

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Abstract: *This paper examines the role of communication in the implementation of circular economy, focusing on how students specialising in economic engineering receive and interpret sustainability-related information, as their perceptions may directly shape the extent to which circular-economy practices are understood, adopted, and integrated into future economic and engineering contexts. Based on a quantitative survey method, the study evaluated students' awareness, attitudes, and perceived relevance of circular-economy communication and practices. The findings show that students generally recognise the importance of sustainability communication but differ in terms of how they actually apply circular-economy concepts. The study emphasizes the central role of communication in stimulating sustainability-related behaviours among future engineers, while also highlighting the importance of integrating circular-economy principles into educational and professional environments.*

Keywords: *Circular economy; communication; behavioural change; message; action; sustainability.*

JEL Classification: Q53; Q56; A23

1.Introduction

The transition towards circular economy is essential for environmental sustainability and efficiency as regards the use of resources. However, there is still a gap between awareness as regards circular economy principles and their practical implementation.

This paper investigates how communication might influence the understanding and implementation of circular economy principles among future engineers, since communication is increasingly considered a catalyst for behavioural change in contexts that relate to sustainability.

In order to meet these aims, the study focuses on students studying economic engineering, who directly focus on aspects such as resource management, technological innovation and sustainable industrial processes. Examining how they interpret and engage with information on circularity is essential for evaluating the effectiveness of communication in supporting the transition to more sustainable economic systems. The study therefore aims to identify:

1. Which communication channels and message types most effectively promote sustainable behavioural change?

2. To what extent do persuasive, emotional, or informational messages lead to concrete actions?

Based on these two research questions, the study proposes the following hypotheses:

1. Messages targeted at students studying economic engineering may increase the likelihood that circular-economy principles will be put into practice.
2. Messages that combine technical information with emotional appeal generate the strongest behavioural shifts.

2. Theoretical Underpinnings

2.1. Concepts, principles and implementation models that relate to the circular economy

Circular economy emphasizes the idea that natural resources are finite and must therefore be used efficiently. Compared to the traditional linear model, it aims to limit the extraction of raw materials, reduce environmental degradation, and extend the life of existing resources through reuse, repair, and recycling.

Its main principles include:

1. Product life cycle optimization – Designing products with longer lifespans, ensuring they can be reused, repaired, recycled, or biodegraded at end of their life cycle.
2. Waste minimization – Reducing waste throughout production and consumption.
3. Reuse and recycling – Encouraging repeated use of materials to decrease reliance on raw materials.
1. Resource efficiency – Using natural resources responsibly so as to reduce environmental pressure and support long-term economic sustainability.

These principles relate to both producer responsibility and customer care. At the same time, successful transition towards a circular economy depends on the collaboration among governments, businesses, universities, and civil society to develop supportive policies, innovative business models, and shared systems that enable circular practices. Examples: circular production systems, which rely on renewable resources, minimise waste, and keep materials circulating within the economy; models that support circularity by promoting shared access to goods and services, reducing the need for new production and improving resource efficiency; laws and economic instruments, such as waste taxes, extended producer-responsibility schemes, or subsidies, which create favourable conditions for circular practices to develop.

2.2. Advantages and benefits of the circular economy

The circular economy offers a wide range of environmental, economic, and social advantages that strengthen its capacity to support sustainable development. By promoting more efficient use of materials and energy, it reduces reliance on natural resources while lowering waste generation through reuse, repair, and recycling, keeping products and materials in circulation for longer. These practices not only limit pressure on the environment but also stimulate job creation in sectors such as recycling, repair, and waste management. At the same time, the circular economy encourages innovation and competitiveness by stimulating the redesigning of products, the adoption of cleaner technologies, and the implementation of more

efficient business models. Its emphasis on responsible resource management contributes to public health, cleaner environments, and improved quality of life. Taken together, these benefits highlight the potential of circular economy to support economic stability, social well-being, and a development model grounded on ecological sustainability.

3. Organizational and social communication

Recent academic and policy actions are directed towards limiting the growing crisis driven by climate change, ecosystem degradation, and rapid technological change. In this context, communication is increasingly viewed as a mechanism that can sustain and promote circular-economy strategies, shape public understanding and stimulate behavioural change. This analytical perspective is in line with the central focus of this study, namely: (a) how students studying economic engineering interpret messages related to sustainability; and (b) which message types are most likely to determine a change in behaviour related to circular economy.

Major international frameworks, including the European Green Deal and the UN Sustainable Development Goals, now treat communication as a strategic tool for promoting the shift from a linear to a circular model. However, this transition remains complex and requires time, cooperation, and shared principles, while its success depends on behavioural change among consumers, companies, and public authorities.

Salvioni and Almici (2020, p. 8) reinforce this view by demonstrating that effective circular-economy strategies depend on coordinated action from governments, universities, companies, and consumers. To engage actors with diverse interests, shared principles are essential, and communication is able to have an influence upon multiple levels of intervention such as policy, education, and market behaviour.

A recurring theme in the literature is the need for communication strategies aimed at a specific audience. Jha and Verma, 2024 argue that the effectiveness of messages depends on how they are structured in terms of content and the communication channels chosen so as to properly reach target groups. Hernández (2016) and Scarpellini et al. (2020) further show that regional initiatives function most efficiently when communication is adapted to receivers' needs, motivations and comprehension levels of specific communities. This insight is directly relevant to the present research, which examines how a specific generational and educational group (students in economic engineering) respond to sustainability messages.

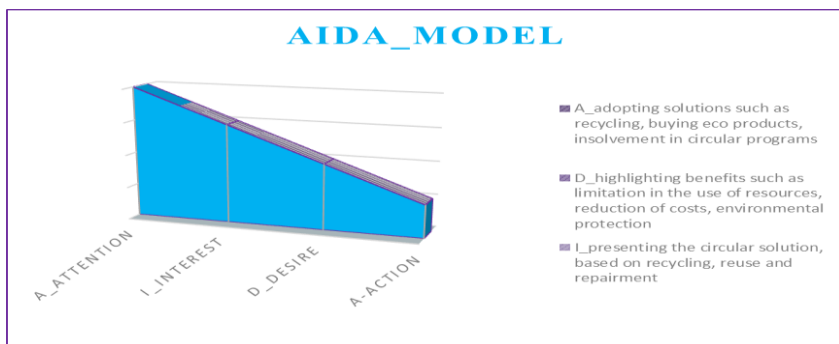
Scholars also emphasise the importance of integrating psychological and socio-demographic variables into communication design. Thus, McKenzie-Mohr (2000) highlights the relevance of demographic and cultural variables. Carbonell Alcocer et al. (2025) further stress the importance of clear, well-designed messages and the shared responsibility of public authorities, businesses, and academia in promoting sustainable behaviour. Other perspectives reinforce the role of communication in the adoption of circular economy principles.

From a behavioural perspective, Serra and Alfinito (2025) identify key motivational factors, such as raising awareness, countering negative perceptions of recycled products, and leveraging social norms, which are in line with the persuasion theory and its focus on attitudes, beliefs, and social expectations. These ideas directly support the hypotheses of this study, particularly the assumption that messages combining technical information with emotional appeal may generate stronger behavioural shifts.

Taken together, the literature demonstrates the role of communication strategies in turning abstract knowledge into concrete behaviours that support the circular economy. Therefore, it can be argued that effective messages can shape how environmental challenges are understood by specific groups. Targeted communication raises awareness with regard to the relevance of circular economy, influences attitudes by designing it as a field of innovation, and clarifies both benefits and perceived barriers associated to feasibility or cost. Communication motivates people to turn theory into action by choosing circular products, supporting reuse and repair, or integrating circular principles into the process of decision-making. An effective strategy relies on simple, clear language and concrete examples that make concepts accessible. With regard to younger generations, in particular contemporary students, their perceptions are also shaped by constant exposure to digital technologies. Therefore, receive, filter and internalise information in ways that differ dramatically compared to previous generations. As noted by Marcon and Sehnem (2026), who examine strategies for integrating circular-economy principles in schools, this requires using multiple channels (for example courses, seminars, and social media) to reach a broader section of students' community. It is argued that students' involvement the interpretation of information further strengthens their skills and increases their commitment to circular practices.

Building on such ideas, emphasized in literature, several real-world initiatives illustrate how circular-economy principles are already being applied and communicated in practice. Companies such as Patagonia, which promotes a product-life-cycle approach centred on reuse and repair, and IKEA, which has reduced production-related waste by 50% in recent years, demonstrate how clear sustainability messages can stimulate the commitment of organisations to adopt circularity. Similarly, models based on shared-access, such as Zipcar car-rental system show how alternative consumption patterns can reduce resource use and environmental impact. These examples highlight the importance of practical communication that connects circular principles with visible, relatable actions, which can be efficient in the case of students who might prefer concrete, real-world examples.

Communication models traditionally used in marketing can also be adapted to support circular-economy education. The **AIDA model** (Attention, Interest, Desire, Action) offers a structured way to design messages that guide audiences from awareness to behavioural engagement.



This model can help economic engineering students in designing, for example, a reusable packaging system for a university cafeteria: *Attention* through visuals

showing daily waste; *Interest* through explanations of how the system works; *Desire* by emphasising cost savings and environmental benefits; and *Action* through incentives such as return-and-discount schemes. Such applications not only strengthen students' managerial and analytical skills but also demonstrate how communication can transform circular-economy concepts into real, implementable projects.

Good practices can also be supported by educational institutions that integrate circular-economy principles into curricula and communication practices. The University of Cambridge, for example, offers courses that combine theory with case studies, helping students connect abstract concepts with real-world applications. In Romania, the Association of Economic Engineering Students organises seminars that bring experts and students together for interactive discussions, while universities such as the University of Bucharest use digital platforms to disseminate examples of good practice and extend engagement beyond the classroom. These initiatives show how educational communication can contribute to the development of informed and motivated future professionals.

4. Methodology

The present study examines how students from the Faculty of Electrical Engineering and Information Technology, University of Oradea, specialising in Economic Engineering, perceive and respond to communication about circular economy. The methodological approach was designed to identify elements that make communication effective for this generational group (the characteristics of the message, the channels chosen).

In terms of its design, this study is based on a quantitative, questionnaire-based research that aimed to provide data on students' knowledge, attitudes and communication preferences, which might relate to circular economy.

The answers were provided by a number of 77 undergraduate students from the University of Oradea, Faculty of Electrical Engineering and Information Technology, specialising in the field of Economic Engineering in the Electric, Electronic and Energetic Domain, who agreed to answer the 40 items of a questionnaire devised by the authors, based on existing literature on sustainability-related communication and circular economy. To ensure content validity and clarity, the questionnaire was pre-tested to a group of students who were not included in the final sample.

The respondents were given one hour to answer the questionnaire. The participation was fully voluntary.

Data was collected during the second semester of the academic year 2025-2026 (March 2026).

The questionnaire, structured into six thematic sections, combines multiple-choice items with a smaller number of open-ended questions and is designed to explore students' knowledge, attitudes, competencies, and communication preferences related to the concept of circular economy.

In terms of anticipated results, this research will highlight:

- a. How to identify the channels and types of messages that generate the greatest behavioural impact.
- b. A communication model adapted for the implementation of the circular economy with the students from the economic engineering specialization

The collected data were analysed using statistical techniques that allowed us to present the results in terms of percentages. Open-ended questions were analysed through qualitative content analysis, which allowed us to identify aspects that relate to message clarity, perceived barriers and motivational factors.

5. Interpretation of Results

The first section of the research reveals a homogeneous sample, made up entirely of undergraduate students, but highlights a significant information gap regarding the circular economy:

- Limited knowledge (88%): The overwhelming majority of respondents declare a minimal level of familiarity with the concept of circular economy, with 66% being “slightly familiar” and 22% “unfamiliar” with the subject.
- Marginal expertise (11%): Only 8 students consider themselves familiar, while only one respondent (1%) declares an advanced level of knowledge.

Interpretation: The results confirm that circular principles are not yet integrated into students’ academic journeys, requiring urgent curricular intervention to align their skills with the current demands of the field.

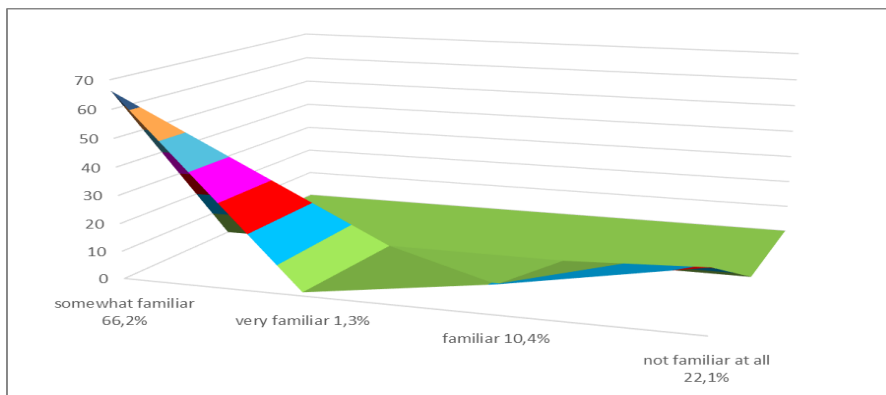


Figure 1: Respondents' familiarity with the concept of circular economy

The second section shows a clear gap between students' interest in circular economy and its limited academic presence. Only 17 of 77 students had encountered the topic in their curriculum. Yet 75 students (97%) consider it important or very important. In the absence of curricular integration of circular economy as a subject, 69 students (90%) rely mainly on online and social-media sources, while getting information from scientific materials represent only 10%.

These result highlight the fact that students turn to informal channels of communication when ideas related to circular economy are not found in academic materials. This supports hypothesis 1, which assumes that targeted messages can influence the adoption of expected behaviour. Overall, the results indicate an underexploited educational opportunity: students are highly motivated to engage with sustainability topics but must depend on unverified information due to insufficient institutional provision.

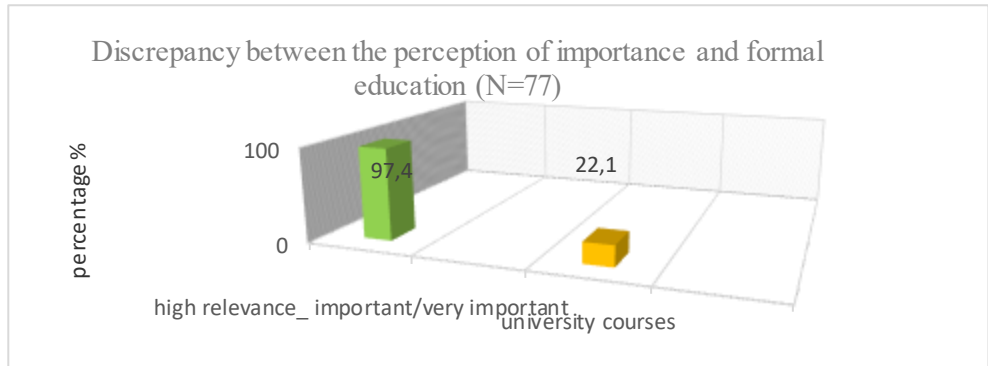


Figure 2. Perception of importance and formal education

The third section examines students' practical experience and the skills needed to apply circular-economy principles. The data show very limited practical exposure: only 7 of 77 respondents (9%) had participated in a circular-economy project. This lack of practice is reflected in their self-evaluations, as most feel only partially prepared and report moderate confidence in applying circular principles. Regarding essential skills, students prioritise sustainable product and service design (59 mentions), followed by waste management and economic impact analysis. These results indicate strong interest in circular-design competencies and highlight the need to shift from theory to practical, project-based learning.

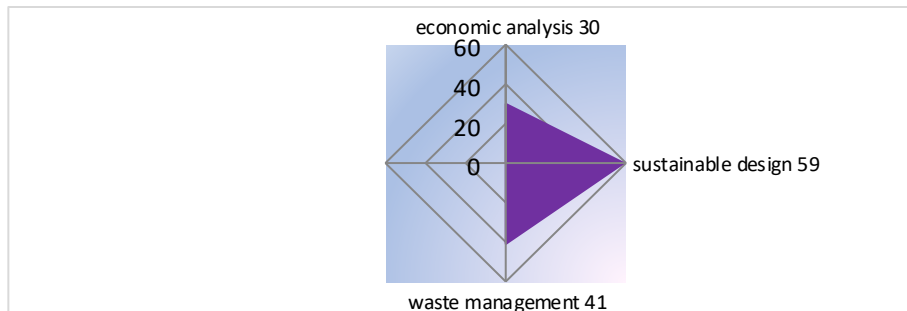


Figure 3. Essential Competencies for Implementing Circular Economy

In conclusion, future professionals clearly consider that interventions at the design stage rather than end-of-life solutions are important for a genuine transition towards more sustainable economic practices.

The fourth section explores how circular principles are part of the respondents' everyday behaviours and waste-reduction efforts. However, a practical perception gap emerges: although only 31 students reported involvement in circular-economy "projects," further detail reveals broader engagement, with 38 students practising recycling and 21 reusing products. This indicates that students often fail to associate individual actions with the formal concept of circularity. They actually engage in circular practices, but do not conceptualise them as being part of circular economy. This lack of conceptual understanding highlights the importance of communication in this process.

All respondents consider student participation in sustainability initiatives important. Waste management and reduced consumption are priorities for 80% of students, though a small minority (6) regard these issues as unimportant. Willingness to change is high, with 76 students (98%) being prepared to adopt more sustainable lifestyles.

Overall, the findings show that students already engage in multiple sustainable practices, yet these are insufficiently connected to the theoretical ideas supporting the circular economy. Strengthening this conceptual link is essential for stimulating the adoption of informed behaviour that supports circular economy.

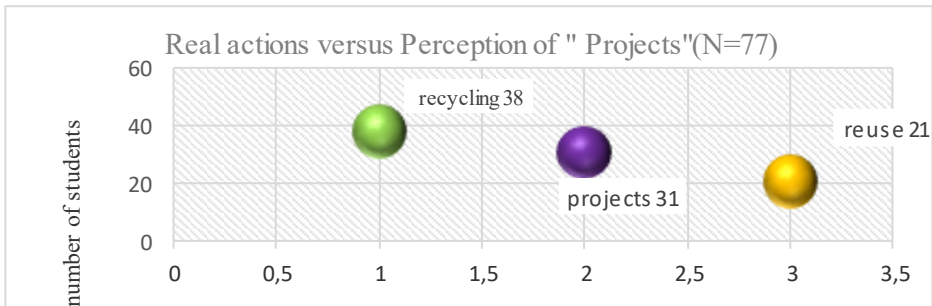


Figure 4. Participation in Projects that Relate to Circular Economy

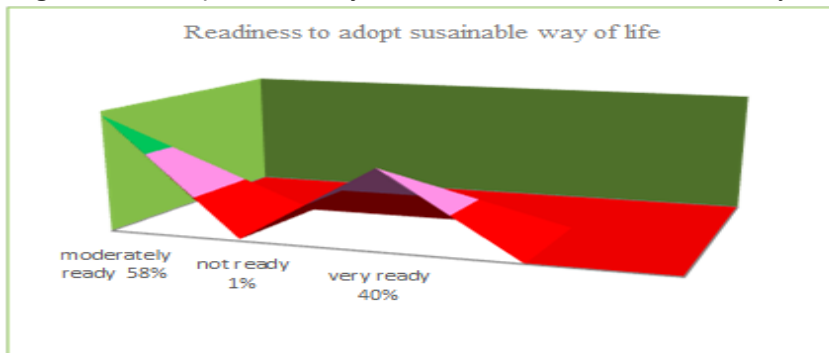


Figure 5. Readiness to Adopt a Sustainable Way of Life

In conclusion, the responses to questions included in the fourth section of the questionnaire indicates a positive tendency: students already engage in concrete sustainability practices, even if they do not consistently use formal academic terminology.

The fifth section examines students' involvement in research, innovation, and future perspectives related to circular economy. Participation in research is minimal, with only 4 of 77 respondents (5%) having taken part in related projects. Nevertheless, technological innovation is viewed as the primary driver of circular transition, identified by 75 students (95%). Interest in new business models is also notable, with 35 students (44%) highlighting their importance, while public policies are prioritised by only 17 respondents (21%).

Overall, although direct research experience is largely absent, students consider technology and circular entrepreneurship as central to future development. The

findings show that innovation laboratories could turn this theoretical interest into practical solutions.

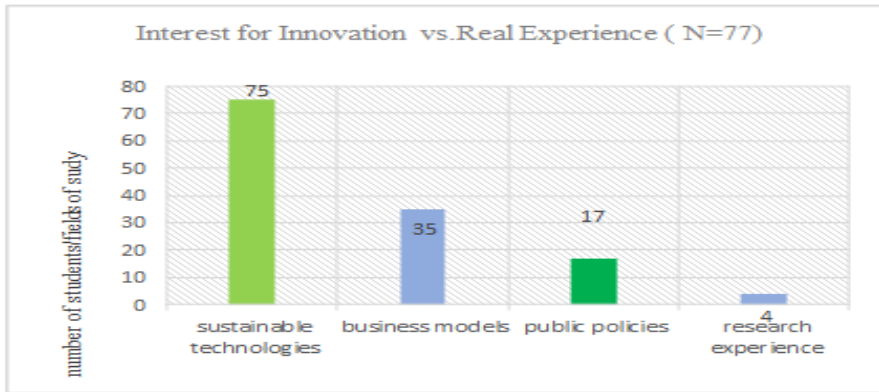


Figure 6. Interest for Innovation and Real Experience

The final section analyses students' preferred communication channels, formats, and communication-related elements that would motivate them to adopt circular-economy behaviours. Students clearly favour dynamic, visual platforms: YouTube (48) and Instagram (38) are their primary information sources, while short-form videos and graphic content are perceived as most effective. Traditional tools such as newsletters or email receive minimal attention (4 mentions). Although university platforms retain moderate relevance, students express a strong preference for experiential formats, with 27 favouring practical workshops and 10 preferring lectures by industry professionals. Message characteristics also matter. To test Hypothesis 2 (whether messages combining technical information with emotional appeal generate stronger behavioural shifts), a comparison was made between students preferring purely informational messages and those preferring mixed emotional-informational messages.

52 students (67%) prefer concise communication, and visual elements are essential for 60 respondents. Preferences regarding tone are divided between informative (38) and emotional or humorous (35) approaches. Messages emphasising the negative consequences of waste have slightly greater persuasive impact (37 students) than those highlighting positive outcomes (28), while mixed text-and-image messages generate high or moderate impact for 97% of respondents.

Overall, the findings indicate that effective communication in a university context must be visual, multichannel, and supported by actual, hands-on learning opportunities. Short, visually engaging messages that balance warnings with constructive solutions appear most effective in translating awareness into concrete action.

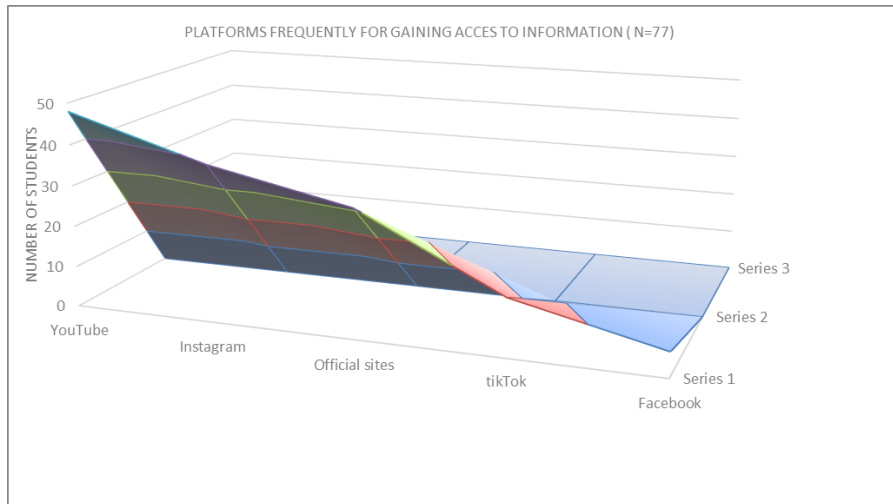


Figure 7. Platforms Accessed for Information on Circular Economy

Therefore, the transition to a circular economy depends on the ability of universities to translate everyday practices such as recycling and reuse into coherent academic concepts, to digitise communication through the visual platforms students prefer, and to provide infrastructure that supports technological innovation and sustainable design.

When asked to describe circular-economy initiatives they would like to see implemented at their university, students mentioned: improving recycling practices, including general recycling programmes, particularly dedicated systems for electronic waste; more selective-collection bins across campus; awareness-raising through seminars, workshops, interactive activities, and accessible written materials such as brochures and leaflet; inter-departmental recycling competitions, repair courses for recovering materials from old electronics; demonstrations of proper recycling techniques, reuse programmes, digital communication to reduce printed materials, and fairs for functional second-hand items. Together, these ideas reveal a preference for practical, visible, and easy-to-use initiatives that make sustainable behaviour more convenient and engaging.

In terms of what would personally motivate them to adopt circular-economy principles, students emphasised: the negative impact of poor waste management; balanced messages that present both the risks and the benefits of circular practices; intrinsic motivation; accessible recycling options and dedicated information spaces; external incentives, including discounts, promotions, or financial rewards for returning used products; cleaner cities, wildlife protection, and stronger engagement from companies and citizens. Overall, the responses suggest that effective motivation requires a blend of emotional engagement, supportive infrastructure, and policy measures that make circular practices both appealing and feasible.

6. Conclusions

This study shows that students in the Economic Engineering programme display strong motivation to understand circular-economy principles, but their learning is

limited by curricular aspects and minimal practical experience. The findings indicate that students are willing to adopt sustainable behaviours but lack opportunities to develop the competencies required for applying circular practices in real contexts. Strengthening the curriculum is therefore essential: at the Economic Engineering program, the circular economy should be taught through both theory and practical experience, enabling undergraduates to understand core principles while developing concrete skills in sustainable product design, waste management, and circular innovation. These desiderates can be achieved through projects, research activities, and community engagement.

The findings, which can be related to the initial research questions, demonstrate that the effectiveness of communication - both in terms of message type and the delivery channel - plays a decisive role in shaping students' openness towards sustainable forms of conduct. The study shows that messages which are clear, adapted to targeted audiences, are more likely to turn into concrete actions. This points to the conclusion that universities must do more than transmit information - they need to adopt communication methods that truly motivate students to act.

In relation to reinforcing circularity-related communication strategies within the economic engineering programme at the University of Oradea, a series of coordinated actions are necessary: introducing students to the core principles and benefits of circularity, integrating practical learning experiences that involve designing sustainable products and applying waste-management strategies, and engaging them in projects centred on recycling, reuse, and waste reduction. These efforts should be complemented by opportunities to participate in research and innovation activities that support the development of new circular solutions, as well as by encouraging involvement in community initiatives that promote circular practices beyond the university. Within the field of economic engineering, it is also essential to analyse the economic implications of circularity, teach students how to develop sustainable and circular business models, and incorporate circular solutions into engineering projects. Together, these actions ensure that circularity is not only taught in theory but becomes an integral part of students' professional formation.

Overall, the research illustrates that communication and curriculum design can support and accelerate sustainable practices and guide the development of sustainability initiatives with high impact for students in economic engineering.

However, even if the study provides valuable insight into students' perceptions, its validity and broader relevance are constrained by several limitations. The sample of 77 respondents is adequate for understanding tendencies, but too small to represent Romanian students more broadly or different academic fields. The exclusive focus on undergraduates limits understanding of how circular-economy knowledge develops at higher levels. This highlights the need for larger, more diverse samples and objective measures in future research.

References

1. Carbonell-Alcocer, A., Romero-Luis, J. & Gertrudix, M. (2025) '*The role of communication in environmental awareness according to circular economy stakeholders*', Journal of Environmental Management, 374, 124112. Available at: <https://doi.org/10.1016/j.jenvman.2025.124112>

2. Geissdoerfer, M., Savaget, P., Bocken, N.M.P. & Hultink, E.J. (2017) '*The circular economy – A new sustainability paradigm?*', Journal of Cleaner Production, 143, pp. 757–768.
3. Heras Hernández, F. (2015) '*Education in times of climate change: Facilitating learning to build a culture of climate protection*', Science Studies Journal, University of Valencia. Available at: <https://doi.org/10.7203/metode.85.422> (doi.org in Bing)
4. Jha, A. & Verma, N. (2024) '*Social media platforms and user engagement: A multi-platform study on one-way firm sustainability communication*', Information Systems Frontiers, pp. 177–194. Available at: <https://doi.org/10.1007/s10796-023-10376-8>
5. Kirchherr, J., Reike, D. & Hekkert, M. (2017) '*Conceptualizing the circular economy: An analysis of 114 definitions*', Resources, Conservation and Recycling, 127, pp. 221–232.
6. Marcon, M.L. & Sehnem, S. (2026) '*Education in circular economy: A proposal for transforming the linear into the circular*', Circular Economy and Sustainability, 6, p. 35. Available at: <https://doi.org/10.1007/s43615-026-00761-1>
7. McKenzie-Mohr, D. (2000) '*Fostering sustainable behaviour through community-based social marketing*', American Psychologist, 55(5), pp. 531–537. Available at: <https://doi.org/10.1037/0003-066X.55.5.531> (doi.org in Bing)
8. Prensky, M. (2001) '*Digital natives, digital immigrants Part 1*', On the Horizon, 9(5), pp. 1–6. Available at: <https://doi.org/10.1108/10748120110424816> (doi.org in Bing)
9. Scarpellini, S., Marin-Vinuesa, L.M., Aranda Usón, A. & Portillo-Tarragona, P. (2020) '*Dynamic capabilities and environmental accounting for the circular economy in businesses*', Sustainability Accounting, Management and Policy Journal, 11(7), pp. 1129–1158. Available at: <https://doi.org/10.1108/SAMPJ-04-2019-0150>
10. Serra, L.S. & Alfinito, S. (2025) '*Consumer behavior in the circular economy: A systematic review of high-impact studies*', Circular Economy and Sustainability, 5, pp. 5315–5349. Available at: <https://doi.org/10.1007/s43615-025-00679-0>
11. Cambridge Judge Business School (2026) *Circular Economy and Sustainability Strategies*. University of Cambridge. Available at: <https://www.jbs.cam.ac.uk/executive-education/environmental-social-and-governance-esg/circular-economy-and-sustainability-strategies/>
12. European Commission (2015) *Closing the Loop: An EU Action Plan for the Circular Economy*.

Appendix 1

Questionnaire: Evaluating the Understanding and Practical Application of the Circular Economy Principles Among Economic Engineering Students

S1. General questions

What is your level of education?

- a. Bachelor's Degree
- b. Master's Degree
- c. Doctorate

How familiar are you with the concept of circular economy?

Very familiar

- a. Familiar

Somewhat familiar

Not familiar at all

S2. Education and raising awareness

Have you been provided with information about circular economy at the university courses?

- a. Yes
- b. No

How important do you think the circular economy is for sustainable development?

Very important

- a. Important

Somehow important

Not important at all

What sources of information about the circular economy have you used?

University courses

Scientific articles

- a. Internet

Social networks

Other (specify)

S3. Developing competences:

Did you have the opportunity to be part of projects that relate to the circular economy?

- a. Yes
- b. No

How prepared do you think you are to implement principles of circular economy in your professional activity?

Very prepared)

- a. Prepared

Somehow prepared

Not prepared at all

Which competencies do you consider essential for effectively implementing the circular economy?

The design of sustainable products and services

Waste management

The analysis of the economic impact

Others (specify)

S4. Projects and initiatives

Have you contributed to projects or initiatives that promote circular economy?

- a. Yes

b. No

What types of projects or initiatives have you participated in?

a. Recycling

b. Reuse

Limiting waste

Others (specify)

How important is, in your view, the involvement of students in projects and initiatives aimed at circular economy?

Very important

Somehow important

Not important at all

- To what extent do you consider issues such as waste, recycling or reducing consumption important?

- How willing are you to adopt sustainable behaviours in your daily life?

S5. Research and Innovation

- Have you conducted research or innovation projects in the field of circular economy?

a. Yes

b. No

- What research areas do you consider to be most relevant for the circular economy?

a. Sustainable technologies

b. Circular business models: product-as-a-service models: examples: leasing services, subscription services, pay-per-use, product-as-a-service.

c. Public-policies

d. Others (specify)

S6. Questions relating to communication

- What kind of content helps you to receive information more easily in general and ideas about the circular economy in particular:

a. Short-videos (Tik-Tok, Instagram Reels, YouTube Shorts)

b. Posts on social networks

c. Newsletter sent by email

d. Online platforms (Microsoft Teams; Moodle)

e. University courses

f. Student clubs

g. Interactive workshops or practical laboratories at the university

h. Lectures with guests working in industry

- What platforms do you use most often to get information (Instagram, TikTok, YouTube, Facebook, official websites)?

- How much does it matter that the messages are visual, interactive or emotional?

- Do you receive informative messages more easily or those that include an emotional/humorous component?

- Do you prefer short messages or detailed explanations?

- Do you find messages that show the negative consequences of waste or those that present positive benefits of sustainable behaviours more convincing?

S7. Read the following message and then answer questions relating to its efficiency

Every year, the electrical and electronics industry generates over 50 million tons of waste, and less than 20% is properly recycled. The rest ends up in landfills, where rare metals – lithium, cobalt, copper, gold – are lost forever.

As future engineers, you will decide whether these resources continue to be wasted or reintegrated into the economy.

Every repair instead of a replacement, every design designed for easy disassembly, every piece of equipment collected separately means less pollution, lower costs for the industry and a reduced dependence on the import of critical materials.

The circular economy is not a slogan – it is a technical competence and a professional responsibility.

Choose to design, use and recycle so that resources circulate, not disappear.

S8. To what extent would this message motivate you to take action?

- a. High extent
- b. Moderate

Little extent

Which element of the message seems more convincing to you?

The image (the questionnaire included an image of a pile of electronic waste)

- a. The words

S9. What type of communication would make the circular economy more attractive to you?

S10. Describe a circular economy initiative you would like to see at your university.

S.11. What would motivate you personally to adopt circular economy principles?