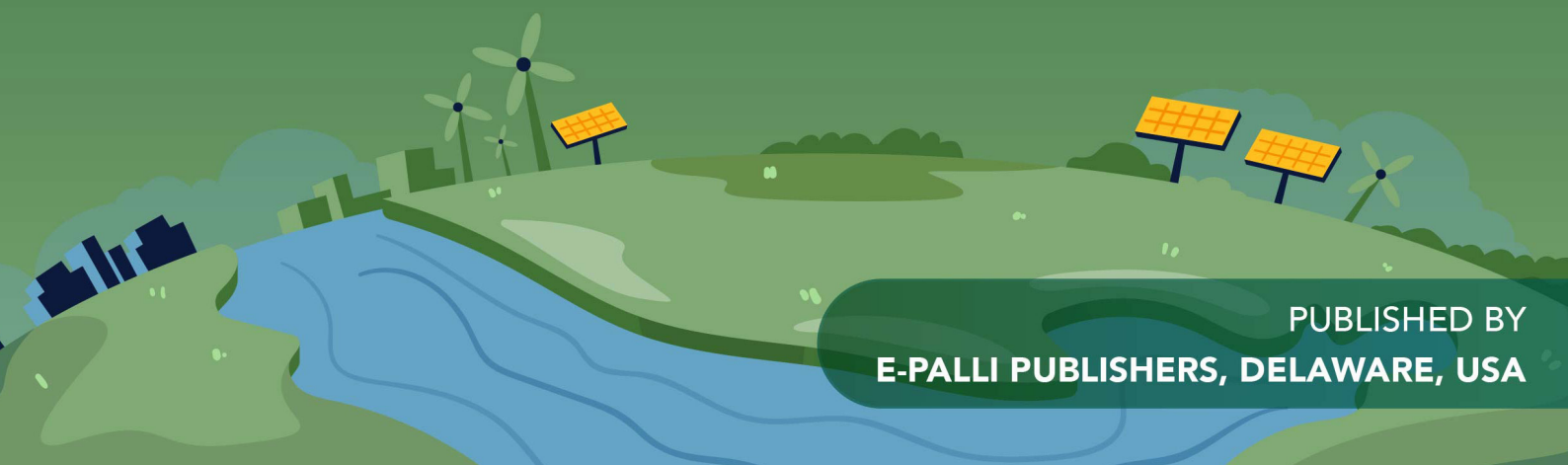




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A Review of Factors Affecting and Impacting Recycling Intentions and Behaviors in Students

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ABSTRACT

The current challenges of global environmental deterioration have been one of the forefront factors that require urgency in mitigation. Global environmental deterioration has a direct impact on the global warming phenomenon that is currently threatening the entire human existence if not adequately handled. Sustainable living is one of the major ways that are required to ensure that critical environmental deterioration is mitigated globally. Also, a significant dimension of sustainability is known as recycle or reuse, this is a process where byproducts and waste of one process are repurposed for something else. Recycling is being taught in environmental education programs, but it has however been recorded to have a low prevalence of practice among individuals especially students relative to their environmental education efforts. This study comprehensively investigates the factors that impact and challenge recycling behaviors in students. The study has findings on the factors that improve recycling behaviors and factors that challenge recycling behaviors in students, and these are used to make adequate recommendations.

INTRODUCTION

The planet is facing critical environmental challenges in recent times, these challenges include the depletion of natural resources, climate change, inadequate waste management, etc (Bennett & Alexandridis, 2021). Several mitigation policies, efforts, and solutions have been designed and implemented, and part of those solutions that have been designed for the mitigation of these challenges is the use of environmental awareness and knowledge endeavors; environmental education (Sow & Chow, 2019). The environmental challenges faced by the planet are complex in nature and require very robust processes of environmental sustainability efforts. Environmental education is a form of increasing the awareness of individuals, knowledge of individuals, and skills of individuals with regard to sustainable practices for sustaining the environment (Luan *et al.*, 2020). Environmental education has been reported to be one of the most efficient tools for the mitigation of climate change and other dimensions of environmental deterioration. According to the declaration of Tbilisi (1978), the aim and objective of environmental education is to enable individuals to carry out informed decisions with respect to environmental sustainability. Several studies have been carried out and have reported environmental knowledge as one of the crucial environmental behavior and decision-making predicting factors (Nananth & Kumar, 2021). Municipal waste is one of the major sources of environmental deterioration, municipal waste is a critical global challenge as the rate of municipal waste generation and lack of adequate waste management processes lead to significant rates of pollution across the globe (Islam *et al.*, 2021).

Recycling is defined as the process of conversion of

previously used resources and objects into some other forms with economic value (Chao *et al.*, 2021). The recycling process is a dimension of environmental sustainability efforts that is regarded as one of the most efficient tools of environmental sustainability and mitigation of environmental deterioration. Successful recycling requires adequate awareness and knowledge in individuals to enable adequate distinguishing and separation of generated waste to enable the right recycling techniques to be applied to the generated waste (Fan *et al.*, 2019). Recycling is a very complex and tedious process that requires complex designed processes for efficiency. Studies carried out to determine the influencing factors of recycling practices have revealed some of the critical influencing factors are planned behavior, and behavioral intentions in individuals (Dixon & Parker, 2022).

Recycling offers a great impact on environmental sustainability. According to the European Commission, recycling practices are one of the most high-impact sustainability practices that have ever been practiced in the efforts of environmental sustainability and mitigation of global climate change (Cho, 2019). Students are one of the most important demographics of sustainable intention and behavior awareness education in order to increase the global culture and rate of recycling efforts (Bennett & Alexandridis, 2021). Environmental education in the context of recycling can be very influential when it is impacted students and when they are encouraged to carry out such practices. Students are both decision-makers and leaders of the future, and the use of environmental education to impact practices of recycling is important for students (Altikolatsi *et al.*, 2021). Recycling as one of the most efficient methods of mitigating ecological deterioration and climate change is an

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effective method that also reduces the need for associated environmental and waste management processes that can be negative on the environment (Kurokawa *et al.*, 2023). Recycling as a process of ecological sustainability reduces greenhouse emissions, reduces the use of landfills, and conserves natural resources. Recycling as an environmental sustainability process not only protects the environment but also offers some economic benefits such as the provision of jobs and reinforcement of social participation (Goldman *et al.*, 2021).

Aim and Objective of Study

Since the beginning of the environmental sustainability and protection campaigns initiated by the declaration of Tbilisi (1978), students have been targeted by environmental education programs to ensure the right awareness and attitude towards the environment is impacted on students at the right time as the future decision-makers and protectors of the environment and the planet. Environmental education programs are designed to cater to students which are drawn from different dimensions of society with different behavioral attitudes and backgrounds to ensure they have similar characters, awareness, and behaviors towards the environment. Recycling as a dimension of environmental education and environmental sustainability practices involves the use of adequate technology and an adequate pro-environmental attitude and awareness towards the environment.

This study is a comprehensive literature analysis of the critical factors influencing and challenging recycling in students. Sociologists and psychologists have carried out an analysis of both direct and indirect actions toward the environment's sustainability, and have come up with a theoretical framework known as the theory of reasoned action (TRA). according to TRA individual intention for recycling is based on individual attitude towards recycling and the subjective norms as perceived by the individual while having the provision of the adequate recycling infrastructure. This study reviews and reports the factors that influence, and challenge recycling in students using literature insights and providing adequate recommendations based on the findings.

Recycling in Younger Demographic

Recycling in the global population and especially so in the young demographic or students is reported to be relatively low. Environmental and recycling awareness in the demographic age range of 16 years to 25 years has been reported to be lower than in other age demographic categories (Ponis, 2020). Hence, the recycling efforts of students are lower than they should be for the benefit of environmental sustainability. Despite the environmental education and sustainability initiatives developed and practiced in educational institutions, there is no significant increase in the behavioral and active practice of recycling efforts in students in such campus scenarios (Luan *et al.*, 2020). Studies carried out by Kruger *et al.* (2020) have

reported reckless behavior toward recycling efforts in students housed in campus accommodations, this is also however contradicting the rise in the consciousness of students with regard to the awareness of climate change which is about 91% in students (Cho, 2019).

The low rates of recycling practices among students have been associated with the complex definition of environmental sustainability; with regard to what can and cannot be recycled (Koutsos *et al.*, 2021). The poor practices of recycling among students are not only the lack of recycling intentions and behavior among students but also entail the inappropriate practice of recycling with actions such as miscategorizing of recycle items. There has been a reported limitation in the literature of investigations on the recycling awareness and behaviors in students, and the impact the environmental education they are subjected to has on their perceptions, intentions, and behaviors towards recycling practices (Huang, 2022). General environmental education and awareness in students encourage recycling behaviors and intentions in students, this is done through the identification and use of themes of recycling environmental education and motivation (Bennett & Alexandridis, 2021).

Factors Affecting Recycling in Students

Environmental education in general, as well as the recycling dimension of environmental education, ensures that students are imbibed with the necessary awareness and skills about the environment and its sustainability (Söderberg *et al.*, 2022). Students are therefore taught and trained with the necessary knowledge and skills for environmental sustainability. Research has shown that the awareness, intentions, and actual behaviors of students need to be carefully paid attention to, as these are all factors that are necessary for environmental sustainability. Some identified factors that affect recycling in students' awareness and behavior are as follows:

Exogenous Motives

This is a factor that is characterized by the motives of social influence and rewards. Studies have observed that the provision of incentives or rewards promotes recycling behaviors in students (Chao *et al.*, 2021). This factor is very impactful in students who have a lower concern about the environment.

Social Influence

This is a factor that impacts recycling in students that stems from the influence of friends, family, and society. This factor plays a significant role in determining recycling behaviors in students, where a student who is surrounded by people who recycle is more liable to engage in recycling practices themselves (Yang *et al.*, 2021).

Endogenous Motives

This is a factor that entails the satisfaction of students or individuals in participating in beneficial activities to their society such as the conservation of nature and

environmental management which can be derived through recycling activities among other activities (Mkhonto & Mnguni, 2021).

Recycling is a process that generally entails the use of comfort factors such as personal effort, money, time, and space (Chao *et al.*, 2021). Hence, students and other individuals perceive the process of recycling as a tedious and resource-consuming process that they would rather not want to get involved in. According to Söderberg *et al.*, (2022), the inconveniences associated with recycling really impact the perceptions, intentions, and behaviors of recycling in students. Another significant influencer of recycling behavior in students and other individuals is the availability of recycling resources. The inadequacy and limited availability of resources used in recycling such as recycling infrastructure; bins, dump vehicles, recycling plants, etc (Franzidis *et al.*, 2023). The lack of readily available recycling infrastructure further feeds the reluctance of students in partaking in the recycling process of environmental sustainability.

Social Norms and Personal Behavior Towards Recycling Behavior

In a research report carried out by Koutsos *et al.* (2021), it is reported that psychological variables such as personal and societal norms/values have a significant impact on the recycling behaviors of students. Societal norms and individual personal norms and values interact with one another to influence the recycling behavior in students.

Parental Impact

A very significant dimension of social norms is considered to be the parental effect that individuals have as a motivation to ensure a better and conserved environment for their children. According to Buil *et al.* (2019), individuals who are parents are more concerned about the state of the environment and its conservation compared with individuals who are not. As a result of this children tend to be exposed to observations of environmental conservation such as recycling and adequate waste management practices in their parents before they become adults (Singh *et al.*, 2020). A higher level of environmental awareness and recycling is observed in students who are from families with an active environmental conservation consciousness.

Relationship between Recycling Attitude and Information Source

Attitude in individuals is defined as the psychological tendency that is expressed in favor of something or against something (Almasi *et al.*, 2019). Attitude with regard to recycling behavior is a key and critical factor in individuals, especially in students as young individuals. Students are exposed to different sources of environmental education and information such as social media, mass media, conventional educational institutions, and various sources of interpersonal communication (Sujata *et al.*, 2019). There are researches that have indicated that a comprehensive understanding of individual attitudes can

be used in optimizing the recycling and environmental education programs for students. There are also studies that have reported some of the most effective sources of information that can be used to impact the recycling behavior in students more effectively alongside their general knowledge of environmental sustainability (Noh, 2021).

Environmental education is one of the most effective tools for ensuring the success of recycling attitudes and behavior in students. According to a study by Koustos *et al.* (2021), corporate-designed environmental education materials designed for consumers are an efficient source of recycling and environmental sustainability. A study by Sukama *et al.* (2020) reported that environmental sustainability and recycling education materials and information obtained from social media sources of eco-activists, environmental sustainability organizations, and other educational social media sources have a significant impact on the positive attitude and behavior of students. Students in the united states of America sampled in a study by Yu *et al.* (2019) have shown that social media sources such as Twitter, Facebook, and other online blogging platforms are often used as sources of useful environmental sustainability and recycling attitude development, especially in undergraduate students, and for graduate students, it has been reported that their most significant source of such information is from conventional television and radio programs for enhancing their environmental sustainability awareness and attitudes. Another study by Altikolatsi *et al.* (2021) reported that interpersonal communication serves as a significant channel for pro-environmental awareness and behaviors such as recycling practices in students, this has led to suggestions of incorporating such outlined sources of information into the design and implementation of environmental education practices.

Normative and Contextual Influences on Recycling Behavior

The prediction of recycling in students and individuals as a whole is contributed to by several contextual factors, these variables include factors such as the convenience and availability of recycling infrastructure (Geiger *et al.*, 2019). Studies have indicated that the availability of recycling infrastructure to students especially in convenient spots around them significantly improves their recycling behavior (Fang *et al.*, 2021). Communal ease of recycling is also a strong indicator and predictor of recycling behaviors in students and individuals because when they are off school properties it is paramount that they have the infrastructure that will continue to foster the recycling behaviors in them (Setiawan *et al.*, 2020). Another contextual and normative factor that influences recycling behavior is the forms and mediums of recycling information outreach to students, studies have shown an increase in the recycling behaviors of students when there are more and more educational outreach programs tailored towards specific recycling efforts and not just general environmental sustainability programs (Niemic *et al.*, 2020).

DISCUSSION

Recycling in students has a lot in common with the general factors that influence or challenge recycling behaviors in general individuals' subjective norms, sources of information, social norms, and personal behavior have a significant impact on the recycling behavior in students as well as individuals in general. The findings in this paper have shown that adequate environmental and recycling education is a critical determinant of recycling behavior in students. However, there are other factors that also influence and determine recycling behaviors in students. These factors include awareness, intentions, and actual behaviors, these factors can generally be influenced through activities designed towards recycling that can motivate them using motives such as endogenous motives, exogenous motives, and social influences. Exposure to environmental sustainability and recycling information as much as possible is a good way to shape and improve the subjective norms of students and individuals. Exposure to such information will develop recycling intentions and recycling behaviors in students.

Environmental education programs should be designed and implemented in such a manner that they will imbibe the characteristics of all the recycling influencing and impacting factors to ensure the development of recycling intentions and behaviors in students. Environmental education programs need to focus on designing experiential learning with the theoretical learning aspect of the programs. Experiential learning enables students to have a real-life experience of applying theoretical knowledge and understanding the impact of what is being taught to them. Experiential learning can also be used to enable and encourage students to design their own recycling programs by creating motives to support their enthusiasm for the projects. Also, media sources need to be focused on designing and delivering adequate recycling information and awareness information. Media sources of information need to be designed and delivered through channels that can optimally reach the target audience based on the demographic data of the students in this context.

CONCLUSION

This paper investigated and reported the factors that impact and influence recycling intentions and behaviors in students. The findings in this paper have reported subjective norms, interpersonal communications, environmental education, recycling motives, and social influence as significant factors that impact recycling intentions and behaviors in students. Students who are exposed to environmental education programs that have more experiential complements to their awareness and education programs have a higher possibility to engage in recycling. Also, students that are exposed to more recycling information from the relevant medium, and given incentives towards recycling processes have a higher chance of engaging in recycling practices. Students and the general public need to be exposed to

adequate environmental education programs that include an emphasis on experiential programs towards recycling behaviors, motives for recycling need to be enabled and enhanced in individuals, and sources of information need to be adequately designed to properly inform both students and the general public on recycling efforts and its advantages to their community and the environment.

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