

EMPIRICAL ANALYSIS OF THE LEVEL OF FORMATION OF WASTE SEGREGATION CULTURE AMONG PEDAGOGY STUDENTS**Sayfullayeva Sabina Nodirbek kizi**3rd year student of Pedagogy, Kokand SU

Annotation: This article presents an empirical analysis of the level of formation of waste segregation culture among students majoring in pedagogy. The study is based on the assumption that future teachers play a crucial role in promoting environmental awareness and sustainable behavior within society. Using a mixed-methods research design, the study examines students' environmental knowledge related to waste management, their attitudes toward waste segregation, and their actual practices in everyday life. Data were collected through questionnaires, observations, and reflective responses from undergraduate pedagogy students representing different years of study. The findings reveal that although most students demonstrate a basic understanding of waste segregation principles and express positive attitudes toward environmental protection, their practical implementation of waste separation remains inconsistent. The results confirm the presence of a knowledge-behavior gap, indicating that environmental knowledge alone is insufficient to ensure sustainable practices. The study also identifies key factors influencing waste segregation culture, including institutional infrastructure, pedagogical approaches, and students' motivation. The article concludes that strengthening the practical and experiential components of environmental education within teacher training programs is essential for fostering a sustainable waste segregation culture. The findings contribute to the improvement of environmental education strategies in higher education and highlight the need for a systemic approach to developing environmental culture among future educators.

Keywords: Environmental culture; waste segregation; pedagogy students; environmental education; sustainable behavior; teacher education; empirical analysis

In recent decades, global environmental challenges such as climate change, excessive waste generation, depletion of natural resources, and environmental pollution have become increasingly acute. Among these challenges, solid waste management and, in particular, waste segregation have emerged as key components of sustainable development strategies worldwide. Effective waste segregation not only reduces environmental pollution but also contributes to resource conservation, recycling efficiency, and the formation of environmentally responsible behavior within society. Consequently, the development of environmental culture related to waste segregation has become a priority issue in modern education systems.

Environmental culture is a multifaceted concept that encompasses environmental awareness, values, attitudes, and practical behaviors aimed at protecting the environment and ensuring sustainable interaction between humans and nature. Waste segregation culture, as a structural element of environmental culture, reflects an individual's readiness and ability to consciously separate waste according to its type (organic, recyclable, hazardous, and non-recyclable) and to understand the ecological, economic, and social significance of this process. The formation of such a culture largely depends on education, particularly higher education, where future specialists and educators develop their professional and civic competencies. In the context of higher education, students majoring in pedagogy occupy a particularly important position[1]. As future teachers, educators, and educational leaders, pedagogy students are expected not only to possess ecological knowledge but also to demonstrate environmentally

responsible behavior and to transmit environmental values to younger generations. Their level of environmental culture, including waste segregation practices, directly influences the effectiveness of environmental education and upbringing in schools and other educational institutions. Therefore, assessing and improving waste segregation culture among pedagogy students is not only an educational issue but also a strategic investment in sustainable development[2]. Despite the growing attention to environmental education, numerous studies indicate that the presence of ecological knowledge does not always translate into environmentally responsible behavior. In many cases, students demonstrate a gap between theoretical understanding of environmental problems and their practical actions in daily life. Waste segregation is a clear example of this discrepancy. While students may be aware of the importance of recycling and waste separation, their actual practices often remain inconsistent or superficial. This contradiction highlights the need for empirical research aimed at identifying the real level of waste segregation culture and the factors influencing its formation[3].

In Uzbekistan, environmental protection and sustainable development have been identified as national priorities. Recent state policies and strategic documents emphasize the importance of ecological education, environmental awareness, and responsible use of natural resources. Within this framework, higher education institutions are tasked with integrating environmental topics into curricula and promoting environmentally friendly behaviors among students. However, the effectiveness of these efforts, particularly in relation to waste segregation culture, remains insufficiently studied, especially among pedagogy students who play a key role in shaping future generations' attitudes toward the environment.

The educational environment of universities provides favorable conditions for forming environmental culture through academic courses, extracurricular activities, campus initiatives, and social projects[4]. Nevertheless, the extent to which these opportunities contribute to the actual development of waste segregation culture depends on various pedagogical, psychological, and social factors. These include students' environmental awareness, motivation, value orientations, availability of infrastructure for waste separation, and the presence of role models within the educational community. An empirical assessment of these factors allows for a more comprehensive understanding of the current state of waste segregation culture and helps identify existing gaps and challenges.

Empirical research plays a crucial role in evaluating environmental culture, as it enables the collection and analysis of real data on students' knowledge, attitudes, and behaviors. Through surveys, observations, and diagnostic tools, researchers can measure the level of waste segregation culture and determine how it correlates with variables such as gender, year of study, participation in environmental activities, and exposure to environmental education. Such data are essential for developing evidence-based recommendations aimed at improving pedagogical strategies and educational policies. Moreover, pedagogy students represent a unique research group due to their dual role as learners and future educators. Their environmental culture is shaped not only by general social influences but also by professional training that emphasizes educational responsibility and ethical values. Understanding how waste segregation culture is formed within this group provides valuable insights into the effectiveness of teacher education programs in fostering environmental responsibility[5]. It also allows for the design of targeted interventions that integrate waste segregation practices into pedagogical training. The relevance of this study is further reinforced by the growing importance of sustainable campuses and green universities. Higher education institutions are increasingly expected to serve as models of environmentally responsible behavior. Students' participation in waste segregation initiatives is a key indicator of the success of such institutional efforts. However, without empirical data on students' actual practices and attitudes, it is difficult to assess the real impact of sustainability policies at the university level. This study seeks to address this gap by providing an empirical analysis of waste segregation culture among pedagogy students. Therefore, the present research aims to empirically analyze the level of waste segregation culture among students majoring in

pedagogy and to identify the main factors influencing its formation. The study focuses on assessing students' environmental knowledge related to waste management, their attitudes toward waste segregation, and their practical behaviors in everyday life. By combining quantitative and qualitative research methods, the study provides a comprehensive picture of the current state of waste segregation culture and highlights areas requiring pedagogical intervention.

The findings of this research are expected to contribute to the development of more effective environmental education strategies in higher education institutions. In particular, the results can be used to improve curricula, design targeted educational programs, and promote practical initiatives aimed at strengthening waste segregation culture among future teachers. Ultimately, enhancing the environmental culture of pedagogy students will have a long-term positive impact on the environmental awareness and behavior of the wider society, as these students will become key agents of ecological education and sustainable development. The concept of waste segregation culture is grounded in broader theoretical approaches to environmental culture and environmental education. From a pedagogical perspective, environmental culture is understood as an integrative personal quality that combines environmental knowledge, value orientations, attitudes, and environmentally responsible behavior. Waste segregation culture represents a practical manifestation of this quality, reflecting an individual's ability and willingness to apply environmental knowledge in everyday life.

Theoretical models of environmental behavior emphasize that knowledge alone is insufficient to ensure sustainable practices. According to the theory of planned behavior, environmentally responsible actions are influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control. In the context of waste segregation, students may possess basic knowledge about recycling but fail to practice waste separation due to low motivation, lack of infrastructure, or weak social norms supporting environmentally friendly behaviour[7]. Therefore, waste segregation culture should be viewed not only as a cognitive construct but also as a behavioral and value-based phenomenon. Pedagogical theories highlight the role of education in shaping environmental values and habits through systematic, practice-oriented learning. Constructivist approaches emphasize active student engagement, reflection, and real-life problem solving, while competence-based education focuses on developing practical skills and socially responsible behavior. From this perspective, waste segregation culture among pedagogy students can be developed effectively only when theoretical instruction is supported by experiential learning, project-based activities, and participation in environmental initiatives. Future teachers occupy a special position within environmental education theory. They are expected to act as carriers of environmental values and role models for learners. Consequently, the level of waste segregation culture among pedagogy students is closely linked to their professional identity and pedagogical responsibility. Theoretical studies suggest that teachers with a high level of environmental culture are more likely to integrate environmental topics into their teaching practice and to promote sustainable behavior among pupils. This assumption underscores the importance of empirically assessing waste segregation culture within teacher education programs. Another important theoretical aspect concerns the institutional and social environment. Ecological systems theory emphasizes that individual behavior is shaped by multiple interacting contexts, including the educational institution, peer groups, and societal norms. In universities, the presence of waste separation facilities, environmental campaigns, and supportive policies can significantly influence students' waste segregation practices. Therefore, the theoretical framework of this study considers waste segregation culture as the result of interaction between personal, pedagogical, and institutional factors[6].

The empirical part of the study was conducted using a mixed-methods approach, combining quantitative and qualitative research methods. This approach allowed for a comprehensive analysis of pedagogy students' waste segregation culture by examining not only their level of knowledge but also their attitudes and actual practices. The study involved undergraduate students majoring in pedagogy from a higher education institution. Participants

represented different years of study, which made it possible to compare waste segregation culture at various stages of professional training. Data collection was carried out through a structured questionnaire, observation of students' behavior in the university environment, and short reflective responses. The questionnaire consisted of three main sections. The first section assessed students' knowledge of waste management and waste segregation principles. The second section focused on attitudes and value orientations toward environmental protection and waste separation. The third section examined self-reported waste segregation practices in daily life, both on campus and at home. A Likert-scale format was used to measure attitudes and behavioral frequency, while open-ended questions provided qualitative insights into students' motivations and perceived barriers. To ensure the reliability of the data, the questionnaire was piloted with a small group of students prior to the main study. Observational data were collected by monitoring waste disposal behavior in selected areas of the university, such as classrooms and common spaces. This allowed for a comparison between students' self-reported practices and their actual behavior. The results of the empirical study revealed a differentiated level of waste segregation culture among pedagogy students. In terms of environmental knowledge, the majority of participants demonstrated a basic understanding of waste segregation principles and the importance of recycling. Most students were able to correctly identify recyclable and non-recyclable materials and recognized the environmental benefits of waste separation[8].

However, the analysis of attitudes and behaviors indicated a noticeable gap between knowledge and practice. While many students expressed positive attitudes toward waste segregation and environmental protection, their actual participation in waste separation activities was inconsistent. Observational data confirmed that waste was often disposed of incorrectly, even in areas where separate waste bins were available. This finding supports theoretical assumptions regarding the knowledge-behavior gap in environmental education.

Differences were also observed across years of study. Senior students generally demonstrated a higher level of environmental awareness and more positive attitudes toward waste segregation compared to first-year students. Nevertheless, this increased awareness did not always result in consistent behavior, suggesting that prolonged exposure to theoretical courses alone is insufficient to ensure sustainable practices. Practical engagement and institutional support appear to play a decisive role. Qualitative responses highlighted several barriers to effective waste segregation. Students frequently mentioned the lack of clear instructions, insufficient number of labeled waste bins, and low peer involvement as factors limiting their participation. At the same time, many participants emphasized that practical workshops, environmental campaigns, and teacher-led initiatives could motivate them to adopt more responsible waste management behaviors. The findings indicate that waste segregation culture among pedagogy students is at a moderate level and remains underdeveloped in terms of practical implementation. From a pedagogical standpoint, this suggests the need to shift from predominantly theoretical environmental education toward more practice-oriented approaches. Integrating waste segregation activities into pedagogical training, organizing campus-based environmental projects, and encouraging reflective practice may significantly enhance students' environmental culture. The results of the study have important implications for teacher education programs. First, environmental education should be systematically integrated into pedagogy curricula, not as a separate theoretical subject but as a cross-cutting theme connected to professional training. Second, universities should create supportive environments that encourage waste segregation through adequate infrastructure and visible institutional commitment.

Finally, pedagogy students should be actively involved in designing and implementing environmental initiatives. Such participation not only strengthens their waste segregation culture but also develops professional competencies related to leadership, responsibility, and educational influence. Strengthening the practical component of environmental education will enable future teachers to serve as effective agents of sustainable development.

Conclusion

This study examined the level of waste segregation culture among students majoring in pedagogy through an empirical analysis that integrated theoretical perspectives with practical investigation. The findings indicate that while pedagogy students generally demonstrate an adequate level of environmental awareness and express positive attitudes toward waste segregation, their actual practices remain inconsistent and insufficiently developed. This discrepancy confirms the existence of a knowledge-behavior gap, which continues to be a significant challenge in environmental education. The results highlight that waste segregation culture is not formed automatically through the acquisition of environmental knowledge. Instead, it emerges as a complex construct influenced by personal motivation, value orientations, institutional conditions, and pedagogical practices. The moderate level of waste segregation culture observed among pedagogy students suggests that current teacher education programs do not fully capitalize on their potential to foster environmentally responsible behavior. The study also underscores the importance of the educational environment in shaping students' ecological practices. Even when students possess relevant knowledge, the absence of supportive infrastructure and clear institutional guidelines limits their ability to translate awareness into action. This finding emphasizes that environmental culture development requires a systemic approach that combines curriculum content, practical experience, and an environmentally supportive campus environment. Overall, the empirical evidence demonstrates that pedagogy students, as future educators, represent a strategically important group for the promotion of sustainable waste management practices. Enhancing their waste segregation culture is essential not only for improving environmental behavior at the university level but also for ensuring the effective transmission of environmental values to future generations. Therefore, strengthening the practical dimension of environmental education within teacher training programs should be regarded as a priority task in higher education.

Based on the findings of the study, several pedagogical and institutional recommendations can be proposed to improve the formation of waste segregation culture among pedagogy students.

First, teacher education curricula should integrate waste management and waste segregation topics as part of professional training rather than limiting them to general environmental theory. Practice-oriented modules, case studies, and problem-based learning activities focused on real environmental challenges can enhance students' engagement and foster sustainable behavioral patterns.

Second, higher education institutions should create a supportive infrastructure that facilitates waste segregation on campus. This includes providing clearly labeled waste bins, visual guidelines, and informational materials that encourage correct waste disposal practices. Institutional commitment to environmental sustainability should be visible and consistent to strengthen students' sense of responsibility and involvement.

Third, pedagogy students should be actively involved in environmental projects and initiatives, such as campus clean-up campaigns, recycling programs, and environmental awareness events. Participation in such activities promotes experiential learning and helps students internalize environmentally responsible behavior through direct practice.

Fourth, professional development programs for university instructors should emphasize the importance of modeling environmentally responsible behavior. When teachers demonstrate consistent waste segregation practices, students are more likely to adopt similar behaviors, reinforcing the role of educators as agents of environmental culture.

Finally, future research is recommended to expand the empirical scope of the study by involving multiple institutions and applying longitudinal research designs. Such studies would allow for a deeper understanding of how waste segregation culture evolves throughout teacher

education and how targeted pedagogical interventions influence long-term environmental behavior.

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