



DIGITAL INNOVATION AND ENVIRONMENTAL SUSTAINABILITY IN HIGHER EDUCATION

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ABSTRACT

The present study aimed to investigate the relationship between Digital Innovation and Environmental Sustainability among higher education students. The study employed the Normative Survey Method. A sample of 300 higher education students was selected from various colleges using the Simple Random Sampling Technique. The Digital Innovation Scale developed by Zou Yukun, Xie Weihong, Wang Zhong, and Li Zhongshun (2025) and the Environmental Sustainability Scale developed by Ian Alcock (2012) were used for data collection. The collected data were analyzed using Mean, Standard Deviation, t-test, F-test and Pearson's Product Moment Correlation.

The findings revealed that the majority of higher education students possessed high levels of Digital Innovation and Environmental Sustainability. No significant differences were found in Digital Innovation and Environmental Sustainability with respect to gender. A significant difference was observed in Digital Innovation with respect to locality, whereas Environmental Sustainability did not differ significantly based on locality. Further, Environmental Sustainability showed significant differences with respect to type of management and stream of study, while Digital Innovation did not. The study also revealed a significant and very high positive relationship between Digital Innovation and Environmental Sustainability ($r = 0.865$).

The findings suggest that digital technologies such as e-learning platforms, virtual classrooms, cloud computing, smart campus systems and paperless administration contribute significantly to sustainable educational practices by reducing resource consumption and promoting environmentally responsible behavior. The study concludes that the effective integration of digital innovation in higher education can support environmental sustainability goals and foster the development of environmentally conscious and technologically competent learners.

KEYWORDS: Digital Innovation, Environmental Sustainability, Higher Education, Digital Transformation, Sustainable Development, Smart Campus, Green Education.

1. INTRODUCTION

In the era of rapid technological advancement, higher education institutions are increasingly adopting digital innovation to improve teaching, learning and administrative effectiveness. Digital technologies such as e-learning platforms, smart classrooms, artificial intelligence and cloud computing have transformed traditional educational practices and enhanced institutional efficiency.

Simultaneously, environmental sustainability has become a major global concern due to climate change, environmental degradation and resource depletion. Higher education institutions play a significant role in promoting sustainable practices through environmental awareness, resource conservation and eco-friendly initiatives.

Digital innovation and environmental sustainability are closely interconnected. The adoption of digital technologies in higher education can reduce paper usage, minimize travel through online learning and improve resource management, thereby supporting sustainable development. However, challenges such as inadequate infrastructure, digital inequality and e-waste management affect effective implementation.

Therefore, understanding the role of digital innovation in promoting environmental sustainability is essential for developing technologically advanced and environmentally responsible higher education systems. This study aims to examine the relationship between digital innovation and environmental sustainability in higher education.

2. REVIEW OF RELATED LITERATURE

Shenkoya and Kim (2023) examined the impact of digital transformation on sustainability in higher education in the context of the Fourth Industrial Revolution. The study emphasized that digital technologies such as artificial intelligence, cloud computing and digital learning systems improve educational accessibility, institutional efficiency and sustainable knowledge sharing. The findings revealed that digital transformation contributes significantly to sustainable educational practices by reducing resource consumption and promoting open knowledge systems in higher education institutions.

Angelaki and Bersimis (2024) investigated sustainable development practices in higher education institutions through the integration of information and communication technologies. The study found that embedding sustainability into digital education and institutional



curricula helps universities achieve sustainable development goals. The researchers emphasized that technology-driven education supports environmental awareness, resource conservation and long-term sustainability in higher education.

Goel, Masurkar and Pathade (2024) explored the relationship between digital transformation and environmental sustainability. The study highlighted that digital technologies such as artificial intelligence, big data and smart systems promote efficient resource utilization and environmentally sustainable practices. However, the researchers also pointed out challenges including energy consumption and electronic waste, emphasizing the need for balanced and sustainable digital implementation in educational institutions.

Alenezi (2024) examined the role of digital transformation in promoting sustainable practices in higher education institutions. The study highlighted that digital technologies facilitate resource optimization, reduce operational costs and support environmentally responsible practices through paperless administration, virtual learning environments and smart campus initiatives. The findings indicated that successful digital transformation contributes significantly to institutional sustainability; however, challenges such as inadequate technological infrastructure and digital skill gaps remain barriers to effective implementation.

Castro Benavides, Tamayo Arias, Arango Serna, Branch Bedoya and Burgos (2020) conducted a systematic literature review on digital transformation in higher education institutions. The study revealed that the adoption of digital technologies enhances educational quality, organizational efficiency and innovation. The review further emphasized that digital transformation supports sustainability by reducing resource consumption, improving information management and encouraging environmentally friendly institutional practices. The researchers concluded that strategic integration of digital technologies is essential for achieving long-term sustainability goals in higher education.

3. OBJECTIVES OF THE STUDY

1. To find out the level of Digital Innovation in higher education students.
2. To find out the level of Environmental Sustainability in higher education students.
3. To find out whether there is any significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Gender.
4. To find out whether there is any significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Locality.
5. To find out whether there is any significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Type of Management.
6. To find out whether there is any significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Stream of Study.
7. To find out the relationship between Digital Innovation and Environmental Sustainability in higher education students.

4. HYPOTHESES OF THE STUDY

1. There is no significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Gender.
2. There is no significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Locality.
3. There is no significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Type of Management.
4. There is no significant difference in Digital Innovation and Environmental Sustainability in higher education students with respect to Stream of Study.
5. There is no significant relationship between Digital Innovation and Environmental Sustainability in higher education students.

5. METHODOLOGY OF THE STUDY

5.1 Method of the Study

The present study adopted the Normative Survey Method to investigate the relationship between Digital Innovation and Environmental Sustainability among higher education students. The survey method was considered appropriate as it facilitates the collection of data from a large sample and helps in understanding the existing status of the variables under study.

5.2 Population of the Study

The population of the study consisted of all higher education students studying in colleges and universities in Tamil Nadu.

5.3 Sample of the Study

A sample of 300 higher education students was selected from various colleges of Education in Tamil Nadu. The sample included students from different backgrounds with respect to gender, locality, type of management and stream of study.



5.4 Sampling Technique

The participants were selected using the **Simple Random Sampling Technique**, ensuring that each student had an equal opportunity to be included in the study.

5.5 Tools Used for the Study

The following standardized instruments were used for data collection:

1. **Digital Innovation Scale** developed by Zou Yukun, Xie Weihong, Wang Zhong and Li Zhongshun (2025).
2. **Environmental Sustainability Scale** developed by Ian Alcock (2012).

These tools were used to assess the level of digital innovation and environmental sustainability among higher education students.

5.6 Variables of the Study

Independent Variables

- Gender (Male/Female)
- Locality (Rural/Urban)
- Type of Management (Government/Aided/Self-financing)
- Stream of Study (Arts, Science, Commerce, etc.)

Dependent Variables

- Digital Innovation
- Environmental Sustainability

5.7 Procedure for Data Collection

The investigator obtained permission from the heads of the selected institutions before administering the tools. The questionnaires were distributed to the students and proper instructions were provided regarding the purpose and method of responding. The respondents were assured that the information collected would be used solely for research purposes and kept confidential. The completed questionnaires were collected and scrutinized for completeness before analysis.

5.8 Statistical Techniques Used

The collected data were coded, tabulated and analyzed using appropriate statistical techniques. The following statistical measures were employed:

- Mean and Standard Deviation to determine the level of Digital Innovation and Environmental Sustainability.
- Independent Samples t-test to examine differences based on Gender and Locality.
- One-Way Analysis of Variance (F-test) to examine differences based on Type of Management and Stream of Study.
- Pearson's Product Moment Correlation Coefficient (r) to determine the relationship between Digital Innovation and Environmental Sustainability among higher education students.

6. STATISTICAL ANALYSIS AND INTERPRETATION

6.1 Testing of Objectives

Objective 1: To find out the level of Digital Innovation in higher education students

Table 1: Level of Digital Innovation of Higher Education Students

Level of Digital Innovation	No of Students	Percentage %
Low	46	15.2
Moderate	109	36.5
High	145	48.3
Total	300	100

Interpretation

Table 1 shows the level of Digital Innovation among higher education students. Out of the total sample of 300 students, 46 students (15.2%) possess a low level of Digital Innovation, 109 students (36.5%) possess a moderate level of Digital Innovation and 145 students (48.3%) possess a high level of Digital Innovation.

It is evident from the table that the majority of higher education students (48.3%) have a high level of Digital Innovation, followed by 36.5% of students with a moderate level and 15.2% of students with a low level. This indicates that most higher education students are actively engaged with digital technologies and demonstrate a considerable degree of innovation in utilizing digital tools for learning and academic activities.



Inference: The level of Digital Innovation among higher education students is predominantly high. Hence, the first objective, "To find out the level of Digital Innovation in higher education students," is achieved.

Objective 2: To find out the level of Environmental Sustainability in higher education students

Table2: Level of Environmental Sustainability of Higher Education Students

Level of Environmental Sustainability	No of Students	Percentage %
Low	51	17.0
Moderate	94	31.3
High	155	51.7
Total	300	100

Table 2 presents the level of Environmental Sustainability among higher education students. Out of the total sample of 300 students, 51 students (17.0%) possess a low level of Environmental Sustainability, 94 students (31.3%) possess a moderate level of Environmental Sustainability and 155 students (51.7%) possess a high level of Environmental Sustainability.

The table reveals that the majority of higher education students (51.7%) exhibit a high level of Environmental Sustainability, while 31.3% of the students exhibit a moderate level and 17.0% exhibit a low level of Environmental Sustainability. This finding indicates that most students demonstrate awareness, concern and responsible practices toward environmental protection and sustainable development.

Inference: The level of Environmental Sustainability among higher education students is predominantly high. Hence, the second objective, "To find out the level of Environmental Sustainability in higher education students," is achieved.

6.2 Testing of Hypotheses

Hypotheses 1: There is no significant difference in Digital Innovation and Environmental Sustainability in Higher Education Students with respect to their Gender.

Table 3: Significant difference in Digital Innovation and Environmental Sustainability in Higher Education with respect to Gender.

S.No	Variables	Gender	N	Mean	SD	t-value	Level of Significance
1	Digital Innovation	Male	181	150.50	14.35	0.324	Not Significant
		Female	119	151.01	14.45		
2	Environmental Sustainability	Male	181	150.59	16.28	0.424	Not Significant
		Female	119	151.41	16.76		

Interpretation

Table 3 shows the significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to gender.

For Digital Innovation, the mean scores of male and female students are 150.50 and 151.01 respectively. The obtained t-value (0.324) is not significant at the 0.05 level. This indicates that there is no significant difference between male and female higher education students in their level of Digital Innovation.

For Environmental Sustainability, the mean scores of male and female students are 150.59 and 151.41 respectively. The obtained t-value (0.424) is not significant at the 0.05 level. This indicates that there is no significant difference between male and female higher education students in their level of Environmental Sustainability.

The findings reveal that gender does not significantly influence either Digital Innovation or Environmental Sustainability among higher education students. Both male and female students exhibit almost similar levels of Digital Innovation and Environmental Sustainability.

Inference

The null hypothesis, "There is no significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to their gender," is accepted. Therefore, gender is not a determining factor influencing Digital Innovation and Environmental Sustainability among higher education students.

Hypotheses 2: There is no significant difference in Digital Innovation and Environmental Sustainability in Higher Education Students with respect to their Locality.

**Table 4: Significant difference in Digital Innovation and Environmental Sustainability in Higher Education with respect to Locality.**

S.No	Variables	Gender	N	Mean	SD	t-value	Level of Significance
1	Digital Innovation	Rural	158	89.61	7.65	2.152	Significant at 0.05 level
		Urban	142	87.90	7.92		
2	Environmental Sustainability	Rural	158	150.36	15.69	0.454	Not Significant
		Urban	142	151.11	12.80		

Interpretation

Table 4 shows the significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to locality.

For Digital Innovation, the mean scores of rural and urban students are 89.61 and 87.90 respectively. The obtained t-value (2.152) is significant at the 0.05 level. This indicates that there is a significant difference between rural and urban higher education students in their level of Digital Innovation. Since the mean score of rural students is higher than that of urban students, rural students possess a comparatively higher level of Digital Innovation.

For Environmental Sustainability, the mean scores of rural and urban students are 150.36 and 151.11 respectively. The obtained t-value (0.454) is not significant at the 0.05 level. This indicates that there is no significant difference between rural and urban higher education students in their level of Environmental Sustainability.

The findings indicate that locality significantly influences Digital Innovation, whereas it does not significantly influence Environmental Sustainability among higher education students.

Inference

The null hypothesis, "There is no significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to their locality," is partially accepted. The hypothesis is rejected for Digital Innovation and accepted for Environmental Sustainability. Therefore, locality has a significant influence on Digital Innovation but not on Environmental Sustainability among higher education students.

Hypotheses 3: There is no significant difference in Digital Innovation and Environmental Sustainability in Higher Education Students with respect to their Type of Management.

Table 5: Significant difference in Digital Innovation and Environmental Sustainability in Higher Education with respect to Type of Management.

Sl. No.	Variables	Source	N	Mean	SD	F - value	Level of Significance
1	Digital Innovation	Government	100	89.82	6.23	1.194	Not Significant
		Government Aided	100	91.24	10.19		
		Private	100	91.51	8.01		
2	Environmental Sustainability	Government	100	149.45	10.80	3.570	Significant at 0.05 level
		Government Aided	100	154.23	19.35		
		Private	100	149.97	17.75		

Interpretation

Table 5 shows the significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to type of management.

For Digital Innovation, the mean scores of Government, Government Aided and Private college students are 89.82, 91.24 and 91.51 respectively. The obtained F-value (1.194) is not significant at the 0.05 level. This indicates that there is no significant difference in Digital Innovation among higher education students studying in different types of management institutions.

For Environmental Sustainability, the mean scores of Government, Government Aided and Private college students are 149.45, 154.23 and 149.97 respectively. The obtained F-value (3.570) is significant at the 0.05 level. This indicates that there is a significant difference in Environmental Sustainability among higher education students studying in different types of management institutions. The mean score of Government Aided college students is higher than that of Government and Private college students, indicating a comparatively higher level of Environmental Sustainability among Government Aided college students.



The findings reveal that type of management does not significantly influence Digital Innovation, whereas it significantly influences Environmental Sustainability among higher education students.

Inference

The null hypothesis, "There is no significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to their type of management," is partially accepted. The hypothesis is accepted for Digital Innovation and rejected for Environmental Sustainability. Therefore, type of management has a significant influence on Environmental Sustainability but not on Digital Innovation among higher education students.

Hypotheses 4: There is no significant difference in Digital Innovation and Environmental Sustainability in Higher Education Students with respect to Stream of Study.

Table 6: Significant difference of Digital Innovation and Environmental Sustainability in Higher Education Students with respect to Stream of Study.

Sl. No.	Variables	Source	N	Mean	SD	F - value	Level of Significance
1	Digital Innovation	Arts	145	150.08	15.22	1.379	Not Significant
		Science	142	151.81	13.29		
		Commerce	13	145.61	15.79		
2	Environmental Sustainability	Arts	145	152.05	15.26	3.450	Significant at 0.05 level
		Science	142	156.43	11.29		
		Commerce	13	147.2	15.22		

Interpretation

Table 6 shows the significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to stream of study.

For Digital Innovation, the mean scores of Arts, Science and Commerce students are 150.08, 151.81 and 145.61 respectively. The obtained F-value (1.379) is not significant at the 0.05 level. This indicates that there is no significant difference in Digital Innovation among higher education students belonging to different streams of study.

For Environmental Sustainability, the mean scores of Arts, Science and Commerce students are 152.05, 156.43 and 147.20 respectively. The obtained F-value (3.450) is significant at the 0.05 level. This indicates that there is a significant difference in Environmental Sustainability among higher education students belonging to different streams of study. The mean score of Science students is higher than that of Arts and Commerce students, indicating a comparatively higher level of Environmental Sustainability among Science students.

The findings reveal that stream of study does not significantly influence Digital Innovation, whereas it significantly influences Environmental Sustainability among higher education students.

Inference

The null hypothesis, "There is no significant difference in Digital Innovation and Environmental Sustainability among higher education students with respect to stream of study," is partially accepted. The hypothesis is accepted for Digital Innovation and rejected for Environmental Sustainability. Therefore, stream of study has a significant influence on Environmental Sustainability but not on Digital Innovation among higher education students.

Hypotheses 5

There is no significant relationship in Digital Innovation and Environmental Sustainability in Higher Education.

**Table 7: Significant relationship of Digital Innovation and Environmental Sustainability in Higher Education.**

Sl. No.	Variables	Source	Mean	SD	Correlation Coefficient (r)	Significant
1	Digital Innovation	300	91.75	9.47	0.865	Significant at 0.01 level
2	Environmental Sustainability	300	150.72	14.37		

Interpretation

Table 7 shows the relationship between Digital Innovation and Environmental Sustainability among higher education students.

The mean score of Digital Innovation is 91.75 with a standard deviation of 9.47, whereas the mean score of Environmental Sustainability is 150.72 with a standard deviation of 14.37. The obtained correlation coefficient ($r = 0.865$) is positive and significant at the 0.05 level.

The correlation value indicates a very high positive relationship between Digital Innovation and Environmental Sustainability among higher education students. This implies that as the level of Digital Innovation increases, the level of Environmental Sustainability also tends to increase. Students who demonstrate higher levels of digital innovation are more likely to exhibit greater awareness and practices related to environmental sustainability.

The findings suggest that digital technologies and innovative digital practices contribute positively to sustainable environmental attitudes and behaviors among higher education students.

Inference

The null hypothesis, "There is no significant relationship between Digital Innovation and Environmental Sustainability among higher education students," is rejected. Therefore, there exists a significant positive relationship between Digital Innovation and Environmental Sustainability among higher education students. The correlation coefficient ($r = 0.865$) indicates a very high positive relationship between the two variables.

7. MAJOR FINDINGS OF THE STUDY

Based on the analysis and interpretation of data, the major findings of the study are as follows:

1. The majority of higher education students (48.3%) possess a high level of Digital Innovation, while 36.5% possess a moderate level and 15.2% possess a low level of Digital Innovation.
2. The majority of higher education students (51.7%) possess a high level of Environmental Sustainability, while 31.3% possess a moderate level and 17.0% possess a low level of Environmental Sustainability.
3. There is no significant difference in Digital Innovation among higher education students with respect to gender.
4. There is no significant difference in Environmental Sustainability among higher education students with respect to gender.
5. There is a significant difference in Digital Innovation among higher education students with respect to locality. Rural students possess a comparatively higher level of Digital Innovation than urban students.
6. There is no significant difference in Environmental Sustainability among higher education students with respect to locality.
7. There is no significant difference in Digital Innovation among higher education students with respect to type of management.
8. There is a significant difference in Environmental Sustainability among higher education students with respect to type of management. Students studying in Government Aided institutions possess a comparatively higher level of Environmental Sustainability than those studying in Government and Private institutions.
9. There is no significant difference in Digital Innovation among higher education students with respect to stream of study.
10. There is a significant difference in Environmental Sustainability among higher education students with respect to stream of study. Science students possess a comparatively higher level of Environmental Sustainability than Arts and Commerce students.
11. There exists a significant positive relationship between Digital Innovation and Environmental Sustainability among higher education students.
12. The correlation coefficient ($r = 0.865$) indicates a very high positive relationship between Digital Innovation and Environmental Sustainability, suggesting that higher levels of digital innovation are associated with higher levels of environmental sustainability among higher education students.
13. The findings indicate that digital innovation plays a vital role in promoting environmentally sustainable attitudes and practices among higher education students.
14. The study confirms that the integration of digital technologies in higher education contributes positively to sustainable educational development and environmental responsibility.



8. DISCUSSION OF THE RESULTS

The present study was undertaken to examine the relationship between Digital Innovation and Environmental Sustainability among higher education students. The findings revealed that the majority of higher education students possessed a high level of Digital Innovation and Environmental Sustainability. This may be attributed to the increasing integration of digital technologies in higher education institutions and the growing awareness of environmental issues among students.

The analysis based on gender revealed no significant difference in Digital Innovation and Environmental Sustainability among male and female students. This finding indicates that both genders have equal access to digital technologies and are similarly exposed to environmental education and sustainability practices within higher education settings.

With regard to locality, a significant difference was found in Digital Innovation, while no significant difference was observed in Environmental Sustainability. Rural students demonstrated a comparatively higher level of Digital Innovation than urban students. This may be due to the increasing availability of digital resources and technology-based learning opportunities across rural educational institutions. However, students from both localities exhibited similar levels of environmental sustainability awareness and practices.

The findings concerning type of management indicated no significant difference in Digital Innovation among students studying in Government, Government Aided and Private institutions. This suggests that digital technologies have become widely accessible across different institutional settings. However, a significant difference was observed in Environmental Sustainability, with Government Aided institution students exhibiting comparatively higher sustainability levels. Institutional policies, environmental initiatives and sustainability-oriented programs may have contributed to this variation.

Similarly, no significant difference was found in Digital Innovation with respect to stream of study, indicating that students from Arts, Science and Commerce streams have comparable exposure to digital technologies. However, a significant difference was observed in Environmental Sustainability, with Science students reporting higher levels of environmental sustainability. This may be due to their greater exposure to environmental concepts, scientific awareness and sustainability-related topics in their curriculum.

The correlation analysis revealed a significant and very high positive relationship between Digital Innovation and Environmental Sustainability among higher education students. This finding suggests that increased adoption of digital technologies and innovative digital practices can contribute positively to environmental sustainability. Digital tools such as e-learning platforms, paperless communication systems, virtual classrooms and smart technologies help reduce resource consumption and promote environmentally responsible behaviors.

Overall, the findings of the study highlight the important role of digital innovation in fostering environmental sustainability among higher education students. The results support the view that integrating digital technologies with sustainable educational practices can contribute significantly to the development of environmentally conscious and technologically competent future citizens.

9. EDUCATIONAL IMPLICATIONS

The findings of the present study have several important implications for higher education institutions, educators, curriculum planners and policymakers.

1. Higher education institutions should promote the effective integration of digital technologies in teaching and learning processes to enhance students' digital competencies and innovative thinking.
2. Educational institutions should encourage the use of digital platforms, virtual learning environments and paperless communication systems to support environmentally sustainable practices.
3. Curriculum planners should incorporate topics related to digital innovation, environmental sustainability and sustainable development into higher education curricula to develop responsible and future-ready graduates.
4. Teachers should utilize innovative digital tools such as learning management systems, artificial intelligence applications, virtual classrooms and collaborative online platforms to foster active learning and environmental awareness among students.
5. Institutions should organize workshops, seminars and training programmes to improve students' digital literacy and understanding of environmental sustainability issues.
6. Special attention should be given to strengthening digital infrastructure in both rural and urban educational institutions to ensure equitable access to technological resources.
7. Higher education institutions should implement green campus initiatives, including paperless administration, energy-efficient technologies, digital record management and waste reduction practices.
8. Environmental sustainability programmes should be integrated with digital innovation projects to encourage students to use technology for solving environmental challenges.
9. Educational administrators should formulate policies that support the adoption of eco-friendly digital technologies and sustainable institutional practices.
10. Research and innovation activities focusing on digital solutions for environmental conservation should be encouraged among students and faculty members.
11. Institutions should create awareness programmes highlighting the role of digital technologies in reducing carbon footprints, conserving resources and promoting sustainable lifestyles.



12. Government agencies and educational policymakers should provide financial and technical support for implementing smart campus initiatives and sustainable digital transformation in higher education institutions.
13. Since a strong positive relationship exists between Digital Innovation and Environmental Sustainability, educational institutions should consider digital innovation as a strategic tool for achieving sustainability goals.
14. The integration of digital innovation with environmental sustainability practices can contribute to the development of environmentally responsible, technologically competent and socially conscious citizens capable of addressing future global challenges.

10. RECOMMENDATIONS OF THE STUDY

Based on the findings of the study, the following recommendations are made:

1. Higher education institutions should strengthen the integration of digital technologies into academic and administrative activities to promote innovation and sustainability.
2. Educational institutions should adopt smart campus initiatives such as paperless administration, digital resource management and energy-efficient technologies to enhance environmental sustainability.
3. Regular training programmes should be conducted to improve students' digital competencies and awareness of sustainable environmental practices.
4. Curriculum developers should include courses and activities related to digital innovation, green technology and sustainable development.
5. Institutions should encourage students to participate in technology-based environmental projects and sustainability campaigns.
6. Policymakers should formulate strategies that support digital transformation while ensuring environmentally responsible use of technological resources.
7. Universities and colleges should establish sustainability committees to monitor and promote eco-friendly practices within campuses.
8. Awareness programmes on responsible technology usage, electronic waste management and environmental conservation should be organized periodically.
9. Collaborative partnerships between educational institutions, industries and environmental organizations should be encouraged to promote innovation-driven sustainability initiatives.
10. Institutions should provide adequate digital infrastructure and equal access to technological resources for students from diverse backgrounds.

11. SUGGESTIONS FOR FUTURE RESEARCH

1. Similar studies may be conducted with larger samples covering different states and regions of India to enhance the generalizability of the findings.
2. Future research may compare Digital Innovation and Environmental Sustainability among students of different educational levels such as school, undergraduate, postgraduate and research scholars.
3. Comparative studies may be undertaken between public and private universities to examine differences in digital innovation and sustainability practices.
4. Future researchers may investigate the impact of specific digital technologies such as artificial intelligence, virtual reality and cloud computing on environmental sustainability.
5. Longitudinal studies may be conducted to examine changes in Digital Innovation and Environmental Sustainability over time.
6. Similar studies may be carried out using qualitative or mixed-method approaches to gain deeper insights into students' experiences and perceptions.
7. Future studies may explore the influence of factors such as digital literacy, environmental awareness, technological readiness and institutional support on Digital Innovation and Environmental Sustainability.
8. Research may be conducted to examine the role of digital innovation in achieving the Sustainable Development Goals (SDGs) within higher education institutions.
9. Future investigations may focus on the relationship between Digital Innovation, environmental responsibility, academic performance and student engagement.
10. Experimental studies may be undertaken to evaluate the effectiveness of technology-based sustainability interventions in educational settings.
11. Further research may examine the challenges associated with digital transformation, including digital inequality, cybersecurity concerns and electronic waste management.
12. Studies may also explore the mediating and moderating effects of variables such as environmental awareness, digital competence and sustainable behavior on the relationship between Digital Innovation and Environmental Sustainability.
13. Cross-cultural and international comparative studies may be conducted to understand how digital innovation contributes to environmental sustainability in different educational contexts.



14. Future research may investigate the effectiveness of smart campus models in promoting sustainable educational development and environmental conservation.

11. CONCLUSIONS

The present study examined the relationship between Digital Innovation and Environmental Sustainability among higher education students. The findings revealed that the majority of students possess high levels of both Digital Innovation and Environmental Sustainability, indicating that higher education students are increasingly adopting digital technologies while demonstrating awareness and commitment toward sustainable environmental practices.

The study found no significant differences in Digital Innovation and Environmental Sustainability with respect to gender. However, locality showed a significant influence on Digital Innovation, while type of management and stream of study significantly influenced Environmental Sustainability. These findings suggest that institutional and educational factors play a crucial role in shaping students' sustainability perspectives and digital engagement.

A major finding of the study is the existence of a very high positive relationship between Digital Innovation and Environmental Sustainability. The significant positive correlation indicates that greater engagement with digital innovation is associated with higher levels of environmental sustainability among higher education students. This highlights the potential of digital technologies to support sustainable practices through efficient resource utilization, reduced paper consumption, virtual learning opportunities and environmentally responsible behavior.

In the contemporary educational landscape, digital innovation has become an essential component of sustainable development. The integration of advanced technologies into higher education not only enhances learning experiences and institutional efficiency but also contributes to environmental conservation and responsible resource management. Therefore, higher education institutions should continue to promote digital transformation alongside sustainability initiatives to prepare students for the challenges of a technologically advanced and environmentally conscious society.

In conclusion, the study emphasizes that digital innovation and environmental sustainability are closely interconnected. The effective integration of digital technologies can serve as a powerful catalyst for achieving sustainability goals, fostering environmental responsibility and creating a more sustainable future for higher education and society at large.

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