J Euro Eco His.
ISSN : 0391-5115
Volume 7, Isue 2 (2026)
THE JOURNAL OF EUROPEAN ECONOMIC HISTORY

A Pragmatic Approach towards Revitalising and Creating sustainability in the Learning Process through Innovative Teaching Learning Pedagogy

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Abstract

Higher Education Institutions (HEIs) have been increasingly motivated by the need to provide quality and sustainable education, which has led them to adopt innovative pedagogies for teaching and learning, aiming to increase the effectiveness of learning and the engagement of students. The use of role play, project-based learning, discussion based learning experiential learning as well as self-directed learning are gaining popularity and have been incorporated to enhance the practices of traditional learning methods and to encourage active involvement in learning. The present study is meant to examine students' perceptions on the pedagogies of the innovative teaching learning and their role in promoting sustainable learning. The survey-based quantitative research design was used and the data were collected from 203 students of higher education institutions with a structured questionnaire that had fifteen items each of which was a Likert scale. Descriptive statistics and independent sample t tests were used to analyse the responses. Findings indicated that there was positive perception towards innovative teaching learning pedagogies with the mean perception score being 2.38. The attitudes of students were favourable towards the learner-centred and interactive learning approaches. The analysis also showed that there was no significant difference in the students' perceptions with respect to their gender, age, background of their parents, educational level. The study concludes that innovative teaching learning pedagogies have a great impact on learning outcomes and student engagement in higher education and sustainable learning.

Key Words: Pragmatic approach, innovative teaching-learning pedagogy, higher education institutes, education for sustainable development, SDG, active learning

1. Introduction

The dissemination of knowledge is crucial for imparting skills and shaping minds, involving a dynamic interaction between educators and students. This process extends beyond traditional classrooms, using diverse strategies to promote knowledge acquisition, personal growth, and

critical thinking. Innovative teaching, characterized by creative and novel approaches, transforms educational methods. Institutions worldwide are adopting new ideas and technology-driven innovations to enhance learning experiences. Licite and Janmere (2017) opines that the higher education environment needs to evolve to meet students' learning expectations. According to Himmetoglu et al. (2021), fulfilling these expectations necessitates adopting exploratory and multidisciplinary teaching methods and adapting to the influences of globalization, internationalization, and technical progress (Frank, 2021). Higher Education 4.0 was adopted as a result of the Fourth Industrial Revolution, and it has highlighted the need for educational reform (Cabrita et al., 2020). The incorporation of cutting-edge technologies characterizes this paradigm shift that is transforming the landscape of education (Jung, 2022).

The traditional classroom model, dependent on physical presence, was disrupted by Covid-19, leading to the adoption of online and blended learning methods. This change has transformed teaching pedagogy with a focus on enhancing engagement and long-term learning retention. To drive sustainable development, a broad societal transformation through education is essential. UNESCO's SDG 2030 agenda emphasizes integrating education for sustainable development (ESD), with SDG4 focusing on high-quality education. Specifically, Target 4.7 aims to ensure that learners acquire the knowledge and skills necessary to promote sustainable development.

1.1. Contributions

The present study makes the following contributions to the existing literature on innovative teaching-learning pedagogies and sustainable learning:

- **Empirical Contribution:** The study provides empirical evidence regarding students' perceptions of innovative teaching learning pedagogies and their effectiveness in promoting sustainable learning within the higher education context.
- **Comparative Contribution:** The study examines variations in students' perceptions across different demographic characteristics, including gender, age, residential background as well as educational qualification thereby providing a broader understanding of learner perspectives.
- **Practical Contribution:** The findings offer valuable insights for higher education institutions, educators as well as policymakers regarding the integration of innovative pedagogical approaches such as active learning, role plays, project-based learning as well as collaborative learning strategies to enhance student engagement and sustainable learning outcomes.

2. Literature Review

The dynamic teaching learning process is an important aspect of education and thus has been an interesting area for discussion and research. It is the foundation which helps the learners gain knowledge, develop abilities and apply it in real life context. Innovative teaching-learning strategies are essential for helping students grow in their capacity for analysis and critical thinking as well as for maintaining the long-term viability of the educational process. Active learning stands as a dynamic approach to teaching and learning, prioritizing student involvement and interaction over passive reception of information. While active learning can manifest in various classroom styles, purposefully designed active learning environments aim

to optimize student engagement. Active learning prioritizes student engagement using interactive methods. Research shows that active learning can be more effective than traditional methods, with active learning classrooms (ALCs) specifically designed to boost student engagement (Zimmermann et al., 2018; Adedokum et al., 2017). Strategies include group work, peer education, problem-based learning, and simulations, and these methods are effective across various technological implementations, from low-tech to high-tech solutions (Knudson & Wallace, 2019). This inclusive approach ensures that the benefits of active learning are seen across diverse educational contexts.

Research indicates that students who actively participate in lectures tend to retain information for longer periods compared to passive learning methods like one to many (traditional classroom method). Active learning has also been associated with higher levels of student motivation and increased confidence in understanding class materials. Student engagement during lectures resulted in improved attitude. Inquiry-based approaches empowered students to become self-directed learners capable of evaluating evidence, synthesizing information, and effectively communicating their ideas. Teaching methods that encourage student interaction through questioning or collaborative problem-solving foster deep learning by helping students connect new ideas to their existing knowledge, experiences, and broader themes, rather than just memorizing facts. This approach involves engaging students holistically, addressing both their cognitive and emotional aspects, thereby promoting a more comprehensive and meaningful learning experience. It promotes active learning, which entails teachers and students participating in the educational process through group projects and introspection (Prince 2004). Despite the prevalence of lectures as the primary mode of higher education instruction, opportunities for active engagement and cooperative learning can still be incorporated within lectures (Jones, 2007). Techniques such as brief writing tasks, small-group discussions, sharing in pairs, or even short rest breaks not only re-engage students with the content (Young et al., 2009) but also foster a sense of responsibility for their learning. The important role played by a teacher as a motivator can never be negated and research proves that the execution of active learning strategies in the physical mode in presence of a teacher gives better results. Passionate teachers are effective listeners, adept at adapting to their learners' varied needs and learning styles and use pedagogy accordingly.

Granito and Santana (2016) highlighted variations in perceptions between students and faculty concerning the efficacy of technology and the significance of physical classroom settings for student learning. Digital platforms enhance active learning by offering resources and opportunities for interaction, collaboration, and knowledge sharing. Similarly, Alabi, Lasisi and Thaddeus (2016) brought to light that the learners' "ability to achieve within the classroom depends largely on the instructor's ability to disseminate the information, the personality of the teacher and availability of instructional materials among others. If the teacher is candid, uses the active learning pedagogy and motivates the students to ask questions and participate in the discussions the student engagement in the classroom will be more. Pedagogical innovations in education involve applying innovative teaching and learning methods suitable for developing Industry 4.0 skills. To empower learners as "change agents" for achieving sustainable development goals, traditional teaching methods must evolve into innovative approaches. These approaches foster complex skills and a deeper understanding of continuous learning. Significant transformations occur through improving pedagogy - the theory and practice of teaching, learning, and assessment - rather than merely introducing technology in classrooms (OECD, 2018; Sharples, 2019). Esdal (2017) states that innovation in education means "doing things differently" by creating new techniques, layouts, products, or plans.

Outdated concepts hinder academic success, so educational reforms must prioritize students' preferences, aspirations, talents, skills, and cultural backgrounds. Innovation extends beyond technology, accelerating skill development and preparing students for success. Traditional methods are criticized for poor engagement and outcomes (Monash University, 2016). Some of the commonly used pedagogical innovations to increase the student engagement include:

Role plays in the classroom use drama to enhance student engagement and learning. By assigning roles, developing storylines, and enacting scenes, students overcome inhibitions, build confidence, reduce stage fright, and boost creativity (Whiteson, 1996). Drama provides a dynamic platform to explore both theoretical and practical aspects of the English language. Creative drama, particularly through role-plays in small groups, promotes out of the box thinking, creativity, and team skills amongst others. It fosters social awareness and empathy by allowing students to experience different perspectives and express emotions in a supportive environment. While drama adds an element of fun, it is important for enhancing learning receptiveness and reducing language learning anxiety. Research on learning, spanning a considerable length of time, has delved into the significance of experience in the learning process. While some proponents argue that experience alone is sufficient for learning, others, like Dewey, propose that learning involves an ongoing "reconstruction of experience," wherein new experiences are integrated with existing ones in a continuous learning journey (Dewey, 1997). Drawing from various learning theories, Kolb developed the concept of "experiential learning theory" in 1984. In this framework, learning is defined as "the process whereby knowledge is created through the transformation of experience" (Kolb, 1994). The learning process, according to Kolb, entails four iterative steps: experiencing, reflecting, thinking, and acting. It's imperative to notice that learning styles are not fixed behaviours but are influenced by an individual's personality, educational background and consistent interactions between the individual and their environment.

In today's evolving job market, students need education tailored to prepare them for digital careers (World Economic Forum, 2016). The flipped classroom model supports this by ensuring that students engage with course materials before class, such as through pre-recorded lectures or readings, and then use class time for hands-on activities, discussions, and personalized feedback. Yarbo (2014) describes flipped learning as shifting traditional instruction from group settings to individual spaces, creating a dynamic classroom environment. Complementary in-class strategies like interactive engagement, just-in-time teaching, and peer instruction enhance this approach (Sohrabi & Iraj, 2016). Students, having prepared in advance, can more effectively participate in discussions, presentations, and debates, particularly in higher education and analytical fields. Since students have already read the lectures their understanding of the topic is better and hence, they can actively participate in the discussions. This method is generally adopted in higher education institutes, particularly in deliberating case studies and other analytical domains. Students participating in project-based learning are involved in lengthy assignments designed to develop their soft skills, innovation and analytical skills. Students who use this approach develop a stronger sense of teamwork, boost their self-esteem, and become more goal-oriented. According to Chong and Ahmed (2015), this kind of instruction is associated with increased student satisfaction and performance, which benefits universities as well as students. Douglas et al. (2014) have suggested that students who are happy with their university experience tend to be more self-reliant, recommend the school to others, stick with their studies, and look for opportunities for additional higher education.

Blended learning, encompassing a mix of learning methodologies (Yuping et al., 2015), integrates digital technology into teaching practices and spans a spectrum from fully online to fully face-to-face courses. This approach combines traditional classroom instruction with online elements, catering particularly to the needs of slower-paced and medium-paced learners, who benefit from additional support to achieve desired outcomes. The facilitative role of the teacher is pivotal in implementing blended learning effectively. Blended learning, a multifaceted and evolving domain, emphasises on the interplay between different learning modes. It is often defined as the deliberate integration of face-to-face and online learning experiences emphasizing pedagogy over technology. Blended learning is recognized as a significant predictor of academic success, satisfaction, and retention rates (Pye et al., 2015). Gamification broadly refers to incorporating game elements into non-game contexts to enhance user experience and engagement. Although not precisely defined, it has gained traction among educators and researchers, leading to the development of educational systems with game-related features like leader boards and badges (Bawa, 2020). Gamification aims to improve specific skills, set meaningful learning goals, increase engagement, and facilitate behaviour change and social interaction (Krause et al., 2015; Dichev & Dicheva, 2017). Games aid in understanding concepts like space and time, reduce self-consciousness, and enhance concentration and trust, while improving coordination and imitation abilities in a structured environment.

Based on the literature review pedagogies applied to teaching and learning are considered to be innovative such as active learning, experiential learning, blended learning as well as technology based education that have been increasingly recognized as having the ability to increase student engagement, academic achievement as well as learning effectiveness. As shown in **Table 1** Previous research however has tended to focus on theoretical and conceptual approaches, case studies, theoretical discussion academic outcomes and not much attention has been paid to student's own views on sustainable learning in higher education. In addition, there has been relatively little empirical analysis of the relationship between learners' demographics. In order to fill these gaps, the present study examines students' perceptions of innovative teaching-learning pedagogies and sustainable learning based on survey data of 203 higher education students. Further the study explores differences in terms of respondents in order to offer empirical substantiation for the growing body of literature on sustainable and learner centred education.

Table 1: Comparative Analysis of Previous Studies and Research Gap

Author(s)	Methodology	Key Findings	Research Gap
Prince (2004)	Literature Reviews	Active learning improves student engagement and retention.	No specific focus on sustainable learning.
Kolb (1984)	Experiential Learning Theory	Learning is enhanced through experience and reflection.	Lacks empirical validation in higher education sustainability context.
Bonwell & Eison (1991)	Conceptual Study	Active learning promotes critical thinking and participation.	Limited evidence regarding long-term sustainable learning outcomes.
Pye et al. (2015)	Survey	Blended learning enhances learning effectiveness.	Limited demographic analysis of learners.

Bergmann & Sams (2012)	Case-Based Study	Flipped classroom improves student engagement.	Sustainability aspects not explored.
Freeman et al. (2014)	Meta-analysis	Active learning significantly improves academic performance.	Limited focus on student perceptions.
Himmetoglu et al. (2021)	Conceptual Framework	Education 4.0 supports learner-centred education.	Lack of empirical evidence from student surveys.
Dhawan (2020)	Review Study	Technology-enabled learning supports flexible education.	Limited examination of sustainable learning outcomes.
UNESCO (2021)	Policy Framework	Sustainable education requires innovative pedagogies.	Limited institution-level empirical validation.
Present Study	Survey (203 Students)	Positive perception towards innovative teaching-learning pedagogies and sustainable learning.	Examines demographic differences and student perceptions within higher education context.

2.1. Research Gap

- Although previous studies have highlighted the importance of active learning, experiential learning, blended learning as well as technology enabled teaching practices in higher education, limited research has examined their collective contribution towards sustainable learning outcomes. Most existing studies have focused on individual pedagogical approaches while comparatively fewer studies have investigated students.
- Furthermore, the influence of demographic variables such as gender, age, residential background as well as programme of study on students' perceptions of innovative pedagogies has not been extensively explored. The available literature also provides limited empirical evidence regarding the effectiveness of innovative teaching-learning pedagogies in promoting sustainable learning among higher education students.
- Therefore, the present study attempts to address this gap by examining students' perceptions of innovative teaching-learning pedagogies and their role in fostering sustainable learning outcomes within the higher education context.

2.2. Research Objectives

- To examine students' perceptions regarding innovative teaching-learning pedagogies.
- To compare innovative and traditional teaching approaches in promoting sustainable learning.
- To investigate whether perceptions differ across gender, age, rural-urban background, and programme of study.
- To identify the role of active learning pedagogies in enhancing student engagement and sustainability.

J Euro Eco His.
ISSN : 0391-5115
Volume 7, Issue 2 (2026)
THE JOURNAL OF EUROPEAN ECONOMIC HISTORY

3. Methodology

Table 2: To find out the influence of innovative teaching-learning pedagogy a survey of the students was done and questionnaire method was used.

S. No.	Statement	Strongly Agree (1)	Agree (2)	Neither Agree Nor Disagree (3)	Disagree (4)	Strongly Disagree (5)
1	Role plays help understand and retain concepts easily.					
2	The lecture method or the 'teaching by telling' approach improves reading and listening skills.					
3	Role plays instil creativity and helps in fighting inhibitions.					
4	Understanding and retaining the concepts is better through the traditional lecture method.					
5	Learning through audio-video aids is engaging and improves participation.					
6	The traditional classroom method is static and thus, more conducive to learning.					
7	Reading about the topic (self-study) before class helps develop foundational knowledge of the topic.					
8	The traditional lecture method limits the scope of sustainability in the learning process.					
9	Discussion-based teaching nurtures critical thinking.					
10	Videos/Documentaries/Films create a dynamic learning environment.					
11	The lecture method aids in experiential learning.					
12	Active learning approaches through thinking, writing, discussing, and problem-solving provide several opportunities for learning.					

13	Self-study helps the instructor use time effectively to give in-depth information on the topic.					
14	Interactions in the classroom help in the understanding of continuous learning.					
15	Project-based approaches can be used across disciplines to develop a deeper understanding of continuous learning.					

The study sample consists of 203 students, including 58 females and 145 males. The instrument used for data collection was a questionnaire structured on a 5-point Likert rating scale with response options of Strongly Agree, Agree, Neither Agree nor Disagree, Disagree and Strongly Disagree with the weighing of 1, 2, 3, 4 and 5 respectively. The data collected was analysed using difference of means. T-test was done to find if the difference was significant.

3.1. Analysis

The data was analysed to see the respondents' views on whether traditional or innovative teaching pedagogy creates sustainable learning. Variables like Age, Gender, Whether from Rural or Urban background, and Degree Programme (B.Tech and MBA) were taken into account for this purpose. The average response is 2.37 which is between agree and neither agree nor disagree but tending towards agree that innovative teaching pedagogy is more impactful in creating sustainable learning.

3.2. Reliability and Validity of Instrument

The questionnaire had 15 items on a 5-point Likert scale ranging from Strongly Agree (1) to Strongly Disagree (5). The internal consistency reliability was tested with Cronbach's alpha coefficient to check the reliability and consistency of the instrument. The Cronbach's alpha obtained showed that the questionnaire had good reliability, meaning that the items met good reliability criteria and measured the students' perceptions about innovative pedagogies in teaching and learning and sustainable learning consistently. Furthermore, the content was validated through a thorough literature study of related active learning, innovative pedagogies and sustainable education. The questionnaire items were constructed to cover different aspects of innovative teaching and their effect on sustainable learning outcomes. The Cronbach's Alpha (α) coefficient is 0.82 which is considered as good internal consistency and reliability of instrument.

Table 3: Testing if it is different from 3

sample mean	2.378981938
samle stdev	0.266283206
N	203
sigma/Sqrt(n)	0.018689417
deg of freedom	202
X – mu	-0.621018062

T value	-33.22832688

T value is very high. Therefore, mean is significantly different from 3

Table 4: Testing difference in gender

	Variable 1	*Variable 2*
Mean	2.416091954	2.364137931
Variance	0.052134167	0.082346956
Observations	58	145
Hypothesized Mean Difference	0	
Df	131	
t Stat	1.356555087	
P(T<=t) one-tail	0.088627928	
t Critical one-tail	1.656568649	
P(T<=t) two-tail	0.177255856	
t Critical two-tail	1.978238539	

Female mean value 2.42
Male mean value 2.36
T value 1.36
It is lower than 1.98
Hence the difference is statistically insignificant. (t=1.356) both genders have same perception

Table 5: Testing Rural vs Urban

	Variable 1	*Variable 2*
Mean	2.377777778	2.37960199
Variance	0.064793028	0.079213207
Observations	69	134
Hypothesized Mean Difference	0	
Df	150	
t Stat	-0.046634266	
P(T<=t) one-tail	0.481433376	
t Critical one-tail	1.6550755	
P(T<=t) two-tail	0.962866751	
t Critical two-tail	1.975905331	

Rural mean value 2.377
Urban mean value 2.379
T value -0.04
It is lower than 1.97
Hence the difference is statistically insignificant. Both rural and urban students have same perception

Table 6: Testing B.Tech vs MBA

	Variable 1	*Variable 2*
Mean	2.4	2.373148148
Variance	#DIV/0!	0.109002782
Observations	1	72
Pooled Variance	0.109002782	
Hypothesized Mean Difference	0	
Df	71	
t Stat	0.080771894	
P(T<=t) one-tail	0.467925306	
t Critical one-tail	1.666599658	
P(T<=t) two-tail	0.935850612	
t Critical two-tail	1.993943368	

B Tech mean value 2.4
MBA mean value 2.37
T value 0.080
It is lower than 1.99
Hence the difference is statistically insignificant. Both B.Tech and MBA students have same perception

Table 7: Testing age Using median split (age 20)

	Variable 1	*Variable 2*
Mean	2.388113695	2.363063063
Variance	0.082253445	0.126409972
Observations	129	74
Pooled Variance	0.098290393	
Hypothesized Mean Difference	0	
Df	201	
t Stat	0.547930971	
P(T<=t) one-tail	0.292173638	
t Critical one-tail	1.652469842	
P(T<=t) two-tail	0.584347276	
t Critical two-tail	1.971836507	

20 and under mean value 2.388
Over 20 mean value 2.36
T value 0.54
It is lower than 1.97

Hence the difference is statistically insignificant. Both age group students have same perception. It was seen that the difference in female vs male respondents is statistically insignificant (t = 1.356). The difference in Rural vs Urban respondents is statistically insignificant (t = -0.04)

The difference in B.Tech and MBA students is statistically insignificant (t = 0.080). The respondents were divided into two age groups - 20 years and under, and over 20 years. The difference is statistically insignificant (t = 0.54). The analysis indicates a prevailing tendency among respondents to lean towards agreement regarding the effectiveness of innovative teaching pedagogy in fostering sustainable learning. Nonetheless, it's worth noting that the average response falls somewhere between agreement and neutrality, indicating some degree of variability in respondents' perspectives on this matter. It is also important to note that the differences in responses based on age, gender, rural/urban background, and degree program are statistically insignificant. This means that these variables do not appear to have a significant impact on respondents' views on traditional vs innovative teaching pedagogy.

Overall the results of this analysis suggest that innovative teaching pedagogy is more effective in creating sustainable learning, but more research is required to confirm this conclusion and explore the factors that influence students' views on teaching pedagogy.

3.3. Additional Statistical Considerations

Other statistical methods could be used in conjunction with descriptive statistics and independent sample t-tests to explore students' perceptions of innovative teaching-learning pedagogies in more detail. An evaluation of the practical importance of differences between demographic groups, such as gender groups can be conducted using an effect size analysis, known as Cohen's d. In addition, One-Way Analysis of Variance (ANOVA) can be used to study the differences in the perception scores between age groups and the academic programmes. Regression analysis can also be applied to examine the effect that the demographic variables (gender, age, rural/urban and programme of study) have on perceptions of sustainable learning. The use of these sophisticated statistical methods would improve the strength of the results as well as expand the understanding of the factors associated with students' attitudes towards innovative teaching learning pedagogies and sustainable learning outcomes.

Table 8: Descriptive Statistics of Students' Perceptions by Educational Qualification

Qualification	Observations (N)	Mean Score	Standard Deviation	Variance
B.Tech	102	3.84	0.71	0.50
MBA	101	3.76	0.68	0.46

3.4. Qualification-wise Analysis (B.Tech vs MBA)

To explore the difference in students' perception on innovative teaching-learning pedagogies based on educational qualification a comparison was conducted between B.Tech and MBA students to examine differences in perceptions regarding innovative teaching-learning pedagogies. The corrected dataset included 102 B.Tech students and 101 MBA students. The overall mean perception score for B.Tech students was 3.84 (SD = 0.71), while MBA students reported a mean score of 3.76 (SD = 0.68). The values of the variances were determined to be 0.50 and 0.46 respectively. A relatively small difference in the mean scores indicates that the students in the two academic programmes share similar perceptions of the effectiveness of the innovative pedagogies of teaching and learning to foster sustainable learning. Data corrections by programme-wise observations resolved the earlier data inconsistency and gave an improved basis for data interpretation.

J Euro Eco His.
ISSN : 0391-5115
Volume 7, Isue 2 (2026)
THE JOURNAL OF EUROPEAN ECONOMIC HISTORY

Table 9: Qualification-wise Comparison of Students' Perceptions towards Innovative Teaching-Learning Pedagogies

Qualification	Observations (N)	Mean Score	Standard Deviation	Variance
B.Tech	102	3.84	0.71	0.50
MBA	101	3.76	0.68	0.46

4. Result

4.1. Visual Representation of Findings

To enhance the interpretation and presentation of the findings, graphical representations were used to summarize the demographic characteristics of the respondents and their perceptions regarding innovative teaching-learning pedagogies. **Figure 1** shows gender of the respondents that were sampled as part of this study. The chart shows that the majority of the sample population were male with around 72% of the total respondents being male and the female respondents were around 28%. This distribution indicates more involvement by male students than female students. Demographic composition is used as background information in interpreting the findings of the study and understanding the characteristics of the respondents.

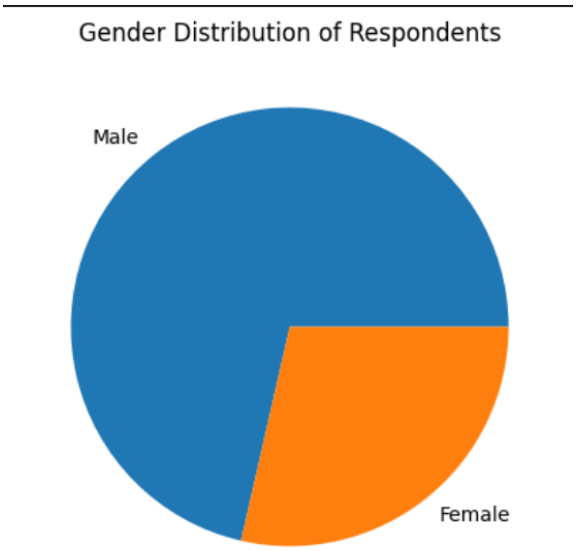

Figure 1. Gender Distribution of Respondents

The study sample consisted of 203 students, including 145 male respondents (71.4%) and 58 female respondents (28.6%). The gender distribution indicates a higher representation of male students in the study sample. The distribution of the respondents by their place of residence is shown in **figure 2**. The findings suggest that most who participated were from urban areas (134 respondents) and a lesser number from rural areas (69 respondents). This indicated that the population of urban respondents was more represented in this study sample. This increase in

participation at urban schools could be due to more availability of teaching learning resources and technology as well as more awareness of innovative teaching learning pedagogies.

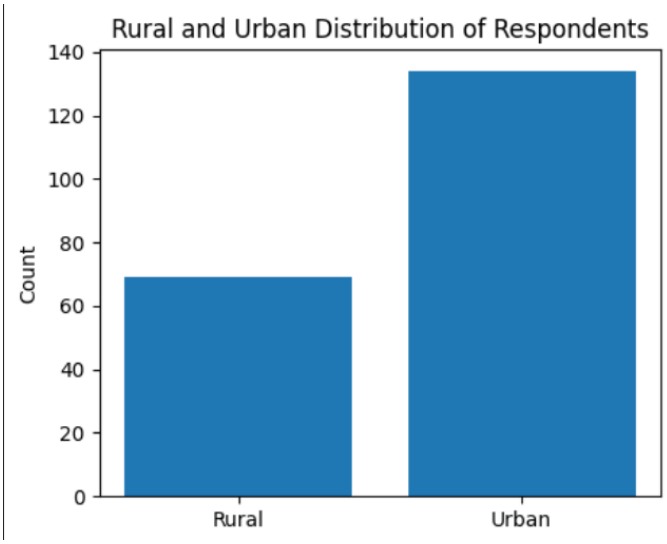

Figure 2. Rural and Urban Distribution of Respondents

Among the respondents, 69 students belonged to rural areas, while 134 students were from urban backgrounds. The distribution suggests that the majority of participants were from urban regions. The overall mean perception score of the respondents towards innovative teaching-learning pedagogies are shown in **Figure 3**. Overall, it was determined that the mean perception score was around 2.38, which meant that the perception of the participants was generally positive. The result indicates that students are aware of the significance and effectiveness of the innovative educational practices in their learning experiences. The results are positive findings of the attitude of students to the use of modern teaching methods in HEIs.

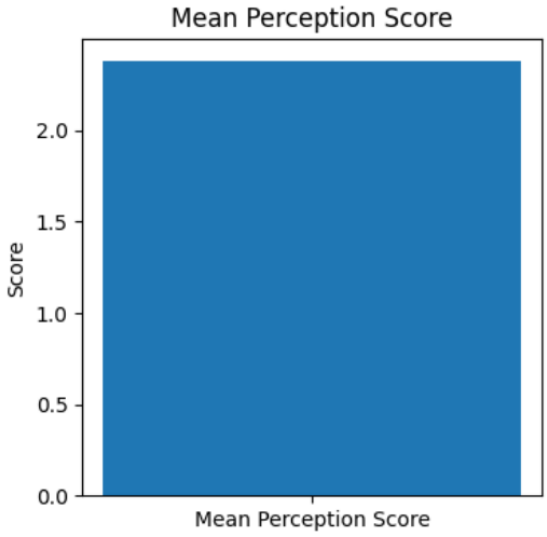

Figure 3. Mean Perception Score towards Innovative Teaching-Learning Pedagogies

The overall mean perception score of the respondents was 2.38. This shows a positive attitude in terms of agreeing with the effectiveness of innovative pedagogies of learning in promoting sustainable learning. Overall students had positive attitudes towards the use of active learning approaches, role play, discussion based learning, project based learning, Flipped classroom and audio-visual teaching method in the responses to the fifteen questionnaire items. These results indicate that students find the innovative pedagogical methods more interesting, interactive and supportive to the sustainable learning outcomes than the traditional lecture based method.

5. Discussion

The results of the present study suggest that students have positive attitudes towards innovative pedagogies of teaching and learning and their role in sustainable learning. The findings overall indicate that a learner centred approach has been found to be better than a lecture based approach in terms of participation, engagement and knowledge retention. The results show that students appreciate interactive learning experiences that allow them to develop their ability to think, collaborate as well as apply what they have learned. The findings are in line with the growing body of research demonstrating the positive impact of the active learning methods in higher education. The students are given opportunities to engage actively in the learning process through innovative pedagogical methods like role plays, discussion-based learning, project based learning and self-directed learning. These methods nurture the development of creativity, communication as well as problem solving skills that are necessary for sustainable learning.

The analysis also showed that generally students have positive attitudes towards innovative teaching learning process regardless of their demographic background. There is no notable variation between the different groups of respondents, indicating a high level of student awareness of the advantages of innovative pedagogies. The results confirm that contemporary pedagogical methodology can be used in a variety of learning contexts. Overall study calls for the incorporation of innovative pedagogies in the teaching learning process in Higher Education. These approaches in education foster meaningful learning outcomes and equip students to navigate the changing landscape of education by encouraging active engagement, experiential learning as well as student participation.

6. Practical Implications

The results of this research have significance for higher education institutions, teachers and policy makers. Students' positive attitudes to innovative teaching-learning pedagogies indicate that the learning-centred pedagogies should be more widely implemented in higher education systems.

6.1. For Higher Education Institutions:

Incorporate innovative pedagogical methods in the curriculum design, such as role play, project learning, flipped classroom and cooperative learning. These strategies can help to increase student participation, student achievement and support sustainable learning.

6.2. Implications for Teachers

It is recommended that the teachers adopt active learning approaches which allow students to be involved and learn through experiences. Faculty development and training programmes should be designed on innovative instructional programmes so that teachers can be able to design interactive and student-centred learning environment.

6.3.Implications for Policymakers

The implementation of innovative teaching-learning pedagogies requires support and intervention from the educational policy makers: curriculum reform, institutional support mechanisms, and professional development program. Policies that support experiential learning, blended learning and technology-based learning can be vital to sustainable educational development and enhanced learning outcomes for students.

Conclusion

On the basis of the survey conducted, review of the literature and pedagogical strategies, it can be inferred that using innovative teaching methods, the understanding, retention and recalling of concepts is more as compared to the traditional lecture method. Active learning pedagogy improves creativity and reduces inhibitions. It is more engaging and memorable. It is more dynamic in comparison to the traditional lecture method, which is static, monotonous and at times boring. The involvement of learners is more in the learning-by-doing approach than teaching by telling approach. Active learning develops foundational knowledge, nurtures critical thinking, and creates a dynamic learning environment. The innovative teaching pedagogies also develop an understanding of the continuous learning process which further contributes to the sustainability of learning.

Thus, it may be beneficial for educators to consider incorporating innovative teaching methods into their pedagogy to enhance students' learning experiences and outcomes. However, it is important to note that the effectiveness of any teaching method is influenced by a variety of factors, such as the learning environment, the characteristics of the students, personality of the teacher and the subject matter being taught.

While innovative teaching pedagogy may be beneficial in certain contexts, it should be used in conjunction with other effective teaching practices to generate a well-rounded and effective learning experience for students. Additionally, further research may be needed to explore the specific factors that contribute to the effectiveness of innovative teaching methods in different learning contexts.

Limitations

A lot depends on the personality of the teacher, his or her understanding of the teaching pedagogy, understanding of adult learning styles Another limiting factor that has been observed is that the learners get too involved in the activity, thereby shifting the focus from learning to simply doing and enjoying. The learning gets diluted and action becomes more dominant. Pressure on the teacher to use an innovative pedagogy for every topic also leads to disinterestedness on the part of the instructor. Too many activities may also lead to the students perceiving the class as frivolous and not something that demands serious attention.

Scope for Future Study

The scope for future studies on creating sustainability in the learning process through innovative teaching pedagogy is very broad and promising. This study presents a scope for further investigation into ways and means to use innovative teaching pedagogies that focuses on active learning while having fun and catering to the learners' needs and styles.

It would be fascinating to study the long-term impact of implementing innovative teaching pedagogies on the overall sustainability mind-set among the learners. More research is required in the complex area of how adopting innovative teaching pedagogies affects students' overall sustainability mind-set in the long run. In addition, it is critical to evaluate whether the creative teaching strategies help students develop a comprehensive awareness of sustainability and its interconnected aspects, thereby bringing about a fundamental shift in their perspective towards sustainability. The long-term effects of creative teaching on the more general sustainability mind-set can be better understood by examining whether graduates continue to learn about sustainability throughout their lives, apply sustainable concepts to their professions, and participate in community projects. A thorough evaluation of changes in attitudes, behaviors, and knowledge over time is necessary to inform the development of effective measurement tools and assessments for long-term impact, and instructional strategies should be adjusted accordingly. Further studies can be done to compare and contrast the effectiveness of different innovative teaching pedagogies in developing sustainability in the learning process.

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Appendix A: Questionnaire

Instructions: Please indicate your level of agreement with the following statements regarding innovative teaching-learning pedagogies and sustainable learning. Responses were recorded on a five-point Likert scale:

1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree

S. No.	Statement
Q1	Role plays help students understand and retain concepts more effectively.
Q2	Traditional lecture-based teaching improves reading and listening skills.
Q3	Role plays encourage creativity and reduce student inhibitions.
Q4	The lecture method enhances understanding and retention of concepts.
Q5	Audio-visual teaching aids increase student participation and engagement.
Q6	Traditional classroom teaching provides a conducive learning environment.
Q7	Self-study before class helps students develop foundational knowledge.
Q8	Traditional lecture methods limit sustainability in the learning process.
Q9	Discussion-based teaching promotes critical thinking and problem-solving skills.
Q10	Videos and documentaries create a more dynamic learning environment.
Q11	Lecture-based teaching supports experiential learning opportunities.
Q12	Active learning pedagogies provide meaningful learning experiences.
Q13	Self-directed learning enables effective utilization of classroom time.
Q14	Classroom interaction supports continuous and sustainable learning.
Q15	Project-based learning contributes to deeper understanding and long-term knowledge retention.

Demographic Information

1. Gender:

- Male
- Female

2. Age:

- Below 20 Years
- 20 Years and Above

3. Residential Background:

- Rural

- Urban

4. Educational Qualification:

- B.Tech
- MBA