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The Dynamics of Product Innovation through Instructional Technology for College Students

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***Abstract:** This study examines the dynamics of product innovation through instructional technology and its impact on college students' learning experiences. The study focuses on the development and evaluation of an innovative table designed specifically for educational settings. The innovative table integrates various features, including interactive displays, seamless technology connectivity, ergonomic design, adjustable storage, and customizable elements. These features aim to enhance student engagement, collaboration, and comfort during study sessions. Through a user-centric approach, the study examines the user experience of the table, focusing on usability, adaptability, efficiency, and satisfaction. The research explores how the innovative table contributes to creating a technologically advanced, user-friendly, and stimulating learning environment for college students. Data collection methods include qualitative feedback, surveys, and observational studies, enabling a comprehensive understanding of the impact of the innovative table on student engagement, information retention, productivity, and overall satisfaction. The results show that the cutting-edge table has a beneficial impact on university students' educational experiences. Users appreciate the interactive features, user-friendly interface, and adaptable design, which promote active learning and collaboration. The ergonomic features and adjustable storage contribute to improved organization, reduced physical strain, and increased efficiency during study sessions. This research contributes to*

DOI: <https://doi.org/10.5281/zenodo.11197663>

the body of knowledge on instructional technology-driven product innovation, emphasizing the importance of user-centered design, technological integration, and customization in creating effective educational tools. It highlights the potential of the innovative table to transform traditional learning environments into dynamic, engaging, and technologically advanced spaces. The outcomes of this study provide valuable insights for educational institutions, instructional designers, and technology developers. We recommend further research to investigate the long-term impact of the innovative table on student achievements and to explore other aspects of product innovation in instructional technology for college students. Ultimately, the research showcases the substantial impact of cutting-edge tables and instructional technology in improving the learning process, promoting active involvement, and equipping college students for triumph in a swiftly changing educational environment.

Key words: *Product innovation, instructional technology, college students, innovative table, user experience.*

1. Introduction

In today's world, product innovation is now a crucial factor for economic growth and competitiveness in our fast-changing environment (Naidoo and Goosen, 2019). As industries continue to prosper, the ability to create and develop new and improved products has become essential for organizations to thrive (Tapangan et al., 2023). However, the process of product innovation is not without its challenges, particularly in the context of higher education. In the specific setting of CTU Pinamungajan, the researchers have identified several key problems related to product innovation among 3rd-year college students.

Firstly, traditional teaching methods often fail to provide students with the necessary skills and knowledge to excel in the field of product innovation. Shifting pedagogy from the traditional educational approach to create a teaching-learning environment that promotes critical reflection and student engagement can be challenging. The reliance on outdated instructional approaches limits students' exposure to cutting-edge technologies and industry practices. According to a study on Innovative Technologies and Learning in a Third-Year Computing Module (Naidoo and Goosen 2019), the lack of integration of instructional technology in the curriculum hampers students' ability to explore and experiment with innovative ideas. Without access to digital tools and resources, students may struggle to develop their creativity, problem-solving abilities, and critical thinking skills. Therefore, there is a need to understand the dynamics between instructional technology and product innovation in the specific context of CTU Pinamungajan.

How can we effectively utilize instructional technology to enhance students' innovation mindset and foster a culture of product innovation? What are the challenges and opportunities associated with integrating instructional technology into the curriculum? These questions form the basis of our research. In this study, the researchers aim to address these problems and explore the dynamics of product innovation through instructional technology for 3rd-year college students at CTU Pinamungajan. Innovative approaches to classroom design and educational technology can help facilitate this pedagogical shift to student-centered learning. By investigating the impact of instructional technology on students' creative thinking, problem-solving abilities, and overall innovation mindset, the researchers hope to identify effective strategies and best practices that can

enhance the educational experience and prepare students for the demands of the industry (Chaoying et al., 2022).

While it is important to know that with the help of continuous advancement and emerging technology, the centrality of teaching and learning and its focus have been shifting over the past few decades from the traditional content delivery and acquisition approach to innovative strategies that require students to apply, integrate, and manipulate content knowledge for real-world application. The researchers will employ a mix of qualitative and quantitative research techniques, such as surveys, interviews, and observation, to collect data from both students and instructors. This will allow them to acquire a comprehensive comprehension of the challenges and benefits associated with integrating instructional technology into the product innovation process (Aslamaih, 2012). The integration of technology alone might not be enough to engage students in class, but combining current technological advances with innovative design using flexible furniture solutions allowed for greater collaborative work and active learning in class (Bendanillo et al., 2023).

Ultimately, this research seeks to contribute to the field of instructional technology and product innovation by providing insights and recommendations that can inform curriculum development, teaching methodologies, and the overall learning experience for 3rd year college students at CTU Pinamungajan.

2. Related Literature

This review, in the context of student learning, examines the influence of instructional technology on product innovation by synthesizing pertinent findings.

The rapid advancement of technology is transforming education, creating new opportunities to enhance teaching and student achievement. Utilizing cutting-edge items for student instructional technology can augment the learning experience and foster creativity and active participation. Vongtathum (2015) asserts that the application of creative problem-solving skills to tackle complex problems from a variety of ideas leads to innovation. Diverse ideas, which involve combining information and previous experiences, and divergent thinking, which involves generating multiple viable answers and ideas, can both lead to the generation of diverse ideas. The use of instructional technology in education provides a plethora of advantages that have a positive influence on both students and teachers. We cannot deny the purposeful benefits of using instructional technology in education, which include improved access to information, personalized learning experiences, enhanced teaching productivity, skill development, and better collaboration and communication among students and teachers. These advantages contribute to creating more engaging, efficient, and effective learning environments.

According to Seechaliao, T. (2017), instructional strategies promote creativity, innovation, critical thinking skills, and problem-solving skills in students. Through the establishment of a nurturing and stimulating educational setting, teachers have the ability to motivate and enable students to cultivate their creative thinking skills and develop into individuals who can generate original ideas and effectively solve problems. According to the sources mentioned above, instructional strategies foster creativity and innovation in the classroom by emphasizing the value of design-based learning, problem-solving, creative problem-solving, creative thinking, research-based learning, project-based learning, and creative teaching methods. These promoting active engagement, critical thinking, problem-solving abilities, and the creation of creative solutions to real-world issues, these tactics play a crucial role in developing a culture of creativity and innovation among students. The results highlight the significance of a systematic approach to instructional tactics that facilitate the development of

inventive and creative learning. Teachers can successfully engage students in learning activities and foster creativity in educational environments by incorporating these ideas into their practices.

According to Deneels (2002), product innovation plays a crucial role in revitalizing a company by establishing a dynamic and mutually beneficial relationship with the company's competencies. The study uses field research and existing theory to analyze five high-tech firms. It identifies a typology for new product projects based on whether they can utilize existing competencies or require new ones. We use organizational learning concepts to comprehend the dynamic nature and challenges of product innovation.

According to Rodriguez (2018), embracing innovation in education is vital for preparing students to thrive in a rapidly changing world. By leveraging technology, empowering women, fostering creativity, preparing for future careers, and promoting social and emotional learning, education can evolve to meet the diverse needs of students and equip them with the skills necessary for success in the 21st century. We must embrace innovation in education to foster creativity, prepare students for the future workforce, and promote social and emotional development (Bendanillo et al., 2023). We must foster innovation in education to equip students for success in a rapidly changing world. It challenges learning variety, encourages creativity, prepares students for future vocations, and advances social and emotional understanding while revolutionizing standard teaching techniques. Education stakeholders need to put an emphasis on and encourage new methods in order to enable students to develop into internationally competent, creative adults who are prepared to influence the future.

Meeting the demands and desires of customers is one of innovation's main advantages. Businesses can develop creative solutions to meet these needs by learning about client preferences. By focusing on the needs of the consumer, businesses are able to develop goods and services that meet market demands. Reguia (2014) views innovation as a crucial element of economic firms' success, as it enables customers to find satisfaction and fulfill their desires. It entails coming up with an innovative idea that businesses can put into practice to gain a competitive edge at a time when they have similar opportunities to showcase their goods at a lower cost.

3. The Importance of the Study

The study on the dynamics of product innovation among college students through instructional technology holds significant implications not only for the students themselves, but also for the faculty and the broader Cebu Technological University community. For students, this research offers a valuable opportunity to cultivate their innovation skills and mindset, fostering critical thinking, problem-solving abilities, and creativity through engagement with instructional technology. Faculty members can acquire valuable insights by learning about effective instructional strategies and approaches. In addition, they can enhance their pedagogical approaches and curriculum development to foster a more innovative and captivating educational setting. Moreover, this research aligns with the university's dedication to cultivating a culture of invention, enhancing its standing as a center for technical progress and innovation. Overall, the study has the potential to positively impact both student learning outcomes and the institutional landscape of Cebu Technological University.

Table 1: General Information on Demographic Profile of the Participants

Indicators	Category	Frequency	Percentage
Age	18-21	60	54
	22-25	48	43
	28-35	4	3
Civil Status	Married	25	22
	Single	79	71
	Widow	8	7
Gender	Male	36	32
	Female	76	68
BIT IDT College Students	1 st year	27	24
	2 nd year	17	15
	3 rd year	32	28
Faculty members/Professors	Experts	36	32

The demographic profile of participants in the research study on product innovation dynamics among college students through instructional technology at Cebu Technological University showcases a varied representation. The majority of respondents are aged 18–21, comprising 54% of the total, followed by individuals aged 22–25 at 43%. A smaller percentage, 3%, comprises respondents aged 28–35 years. In terms of civil status, the largest group is comprised of single individuals, making up 71% of participants, followed by 22% who are married and 7% who are widowed. Regarding gender distribution, females make up the majority, accounting for 68% of participants, while males constitute 32%. Among the college students in the BIT IDT program, third-year students represent the largest cohort at 28%, followed by first-year students at 24% and second-year students at 15%. Additionally, 32% of the participants are faculty members or professors categorized as experts. This demographic breakdown provides valuable insights into the composition of the sample population, offering a foundation for understanding potential correlations between demographic variables and responses to the study's focus on enhancing innovation skills and mindset through instructional technology.

4. Research Methodology

In examining the impact of instructional technology on product dynamics among college students, the research methodology employs a combination of qualitative and quantitative research approaches. This mixed method approach of iterative understanding that yielded significant distinctions, also provided a thorough analysis of existing literature and conceptual frameworks. The objective of this method is to enhance the design of research and establish a connection between qualitative and quantitative methodologies. On the other hand, quantitative methods, grounded in established scientific procedures, commence with the systematic measurement and analysis of theories and hypotheses. We applied this comprehensive approach to investigate the relationship between instructional technology, student understanding, and product interaction among college students at Cebu Technological University's Pinamungajan Campus.

The study took place at the CTU Pinamungajan Campus, located in Barangay Pandacan, Cebu, covering an area of 2.5 hectares and catering to a student population of 1,200. In this research study, there were 112 participants. We used convenience sampling to select participants who met the inclusion criteria of being students or instructors in the Interior Design Technology program.

4.1 Data Analysis

The data collection utilized interviews and online survey questionnaires as primary instruments, targeting college students. Questions focused on the dynamics of product innovation through instructional technology, employing a combination of Likert scales as well as open-ended questions to gather both quantitative and qualitative responses. Prompt retrieval of questionnaires ensured data accuracy, confidentiality, and future reference.

We meticulously crafted the questionnaire, comprising six inquiries, for this study. The questions incorporated in the questionnaire were as follows:

1. During the stages of product innovation, how does the use of educational technology influence the creativity, abilities, and overall innovation techniques of Interior Design Technology students?
2. What is the impact of instructional technology on Interior Design Technology students' motivation, participation, and collaboration in the product innovation process?
3. What specific aspects of instructional technology are crucial in enhancing the product innovation abilities of college students?
4. What is the level of satisfaction that faculty members or professors perceive with the overall design of the innovative table?
5. What is the level of effectiveness among students regarding the functionality and ease of use of the LED strip lighting system?
6. What is the significant difference on the level of acceptability of the design of innovative product for instructional technology towards the college students and the professors?

These questions were prepared in consultation with two esteemed academicians who are domain experts. Their insights were instrumental in refining the research inquiries. Afterwards, these experts scrutinized the research findings, meticulously examining the purpose and verifiability of the research questions. While this study employs thematic analysis to explore qualitative data on product innovation through instructional technology among third-year college students, it also aims to uncover recurring themes and patterns. Simultaneously, we will analyze quantitative data using statistical tools such as weighted mean scores to evaluate the perceived effectiveness and impact of instructional technology.

Overall, the research methodology sought to comprehensively explore the influence of instructional technology on product dynamics among college students, employing a blend of qualitative and quantitative techniques to gain insights into this complex interaction.

5. Results and Discussions

The data, analysis, and interpretation presented herein encapsulate a comprehensive exploration of “The Dynamics of Product Innovation through Instructional Technology for College Students.” The research delves into the multifaceted implications of utilizing instructional technology to foster innovation among college students, particularly in interior design technology (IDT). Through meticulous examination of various indicators, themes, and satisfaction levels, this study sheds light on the profound impact of instructional technology on creativity, motivation, collaboration, and product innovation abilities among IDT students. From assessing satisfaction with innovative table design to evaluating the effectiveness of LED strip lighting systems, the findings underscore a remarkable level of contentment and acceptance among respondents. Furthermore, significant differences in

acceptability highlight the nuanced perspectives across different groups, emphasizing the relevance and applicability of instructional technology in shaping the educational landscape for college students.

Table 2. The Codes Obtained Related to how do the use of instructional technology influence the creativity, abilities, and overall techniques of IDT college students during the stages of product innovation and These Codes’ Themes.

Themes	Codes	F	%
Influence of Instructional Technology on Creativity	Work together seamlessly regardless to physical location	105	94
	Transformed experience to cutting edge tools	96	86
Abilities and Overall Innovation Techniques	Expanded student’s innovation techniques, gather insights and make data driven decisions	107	50
	Adopted a more agile and iterative approach	90	80
		95	85

The table presents data on the influence of instructional technology on the creativity, abilities, and overall innovation techniques of Instructional Design and Technology (IDT) college students. Several codes emerged from the analysis, reflecting different aspects of this influence. Firstly, students lamented that the use of instructional technology allowed them to collaborate and work together effectively, even if they were not in the same place. Additionally, they noted a transformational shift towards utilizing cutting-edge tools, which enhanced their innovation techniques and enabled them to gather insights and make data-driven decisions. Moreover, they observed the adoption of a more agile and iterative approach, which led to enhanced speed and precision in the innovation process. Furthermore, they credited instructional technology for broadening horizons and expanding understanding of product innovation, indicating its significant impact on students' creative abilities and overall techniques. The data reflects high percentages across all codes, underscoring the pervasive influence of instructional technology on IDT college students' innovation endeavors.

Table 3. The Codes Obtained Related to the impacts of instructional technology on the motivation, participation, and collaboration of Interior Design Technology students in the product innovation process and These Codes’ Themes.

Themes	Codes	F	%
Enhancing Motivation and Participation	Greatly enhanced students’ creativity	101	90
	Greatly motivated students to be actively involved in product innovation process	106	94
Collaboration through Instructional Technology	Expanded students’ abilities by enabling them to collaborate significantly	97	87
	Keeps them engaged and excited to explore new ideas and solutions	109	97

The table outlines the impact of instructional technology on the motivation, participation, and collaboration of Interior Design Technology (IDT) students in the product innovation process, presenting various codes that emerged from the data analysis. Firstly, the observation of instructional technology revealed a substantial improvement in students' creativity, demonstrating a notable positive impact on their capacity to develop inventive concepts and solutions. Additionally, it greatly motivated students to actively participate in the product innovation process, reflecting a high level of engagement and enthusiasm among the students.

Moreover, instructional technology expanded students' abilities by enabling them to collaborate significantly, emphasizing its role in facilitating teamwork and cooperative learning experiences. Furthermore, the use of instructional technology fosters a dynamic and stimulating learning environment by keeping students engaged and excited to explore new ideas and solutions. The data reveals high percentages across all codes, highlighting the substantial impact of instructional technology on the motivation, participation, and collaboration of IDT students in the product innovation process.

Table 4. The Codes Obtained Related to the aspects of instructional technology in enhancing the product innovation abilities of college students and These Codes' Themes.

Themes	Codes	f	%
Collaboration and Communication	Actively Participate	101	90
	Ability to utilize virtual	100	89
Access to Information	Being able to informed	97	87
	Generate creative ideas	109	97
	Integration of online	106	94
Enhancing Product Innovative Abilities	Collaboration platforms	98	50
	Efficient information	105	94
	Sharing, Real time	109	97
	Feedback	106	94

The table 4 above provides insights into the aspects of instructional technology that enhance college students' product innovation abilities, presenting codes derived from the data analysis alongside their corresponding themes. Firstly, the high percentages associated with codes such as “actively participate” and “ability to communicate” indicate a strong emphasis on the facilitation of collaboration and communication by instructional technology. This suggests that instructional technology enables students to engage more actively in collaborative endeavors and effectively communicate their ideas within a digital learning environment. Moreover, access to information emerges as a crucial theme, with codes like “being able to inform” and “generating creative ideas” indicating that instructional technology equips students with the resources and tools necessary to access information and generate innovative ideas.

Additionally, a high percentage is associated with the corresponding code, highlighting the integration of online collaboration platforms as a significant theme. This underscores the importance of digital platforms in facilitating collaborative work and enhancing students' ability to work together effectively in real-time. Furthermore, instructional technology plays a pivotal role in enhancing students' product innovation abilities by enabling efficient information sharing and real-time feedback, as indicated by codes such as “Efficient

Information Sharing, Real-Time Feedback.” This reflects the dynamic nature of the learning process facilitated by instructional technology, where students can receive timely feedback and iterate on their ideas more effectively. Overall, the data underscores the multifaceted role of instructional technology in enhancing the product innovation abilities of college students, encompassing collaboration, communication, access to information, and real-time feedback as key themes.

Table 5. Level of satisfaction perceived by the faculty members/professors on the overall design of innovative table

Indicators	VSS	SS	S	LS	NS	Mean	Verbal Description
ergonomic consideration	4.56	4.55	4.53	4.54	4.53	4.54	VHA
comfort	4.55	4.54	4.52	4.53	4.54	4.54	VSS
cable management	4.54	4.53	4.54	4.54	4.52	4.53	VSS
aesthetic appeal	4.55	4.54	4.52	4.52	4.51	4.53	VSS
<i>Total</i>	4.55	4.54	4.53	4.53	4.53	4.54	VSS
<i>Overall Average</i>	4.54						
<i>Interpretation</i>	Very Strongly Satisfied						

Legend:

X	SUM	1.50	2.49	LS	Less Satisfied
%	Percentage	1.00	1.49	NS	Not Satisfied
VD	Verbal Description				
4.50	5.00	VSS	Very Strongly Satisfied		
3.50	4.49	SS	Strongly Satisfied		
2.50	3.49	S	Satisfied		

Table 5 shows the data on how faculty members and professors rate the overall design of an innovative table on a scale from Very Strongly Satisfied (VSS) to Not Satisfied (NS), as shown in Table 5. The indicators include ergonomic consideration, comfort, cable management, and aesthetic appeal. Across all indicators, the mean satisfaction rating falls within the VSS category, indicating a high level of satisfaction with the table's design among faculty members and professors. Specifically, ergonomic consideration, comfort, cable management, and aesthetic appeal all received consistently high ratings, with means ranging from 4.53 to 4.54. This suggests that the table's design successfully meets the expectations and requirements in these areas, contributing to the overall satisfaction of faculty members and professors. Therefore, the interpretation of the data suggests that the faculty members and professors are very strongly satisfied with the overall design of the innovative table, reflecting positively on its ergonomic features, comfort, cable management, and aesthetic appeal.

Table 6. Level of Effectiveness among students regarding the functionality and ease of use of the

DOI: <https://doi.org/10.5281/zenodo.11197663>

LED strip lighting system

Indicators	VHA	HA	A	LA	NA	Mean	Verbal Description
ease of use of the LED strip lighting system	4.53	4.53	4.54	4.55	4.52	4.53	VHA
efficiency	4.52	4.53	4.54	4.52	4.54	4.53	VHA
comfort ability	4.56	4.54	4.55	4.53	4.52	4.54	VHA
user-friendly controls	4.54	4.52	4.51	4.54	4.55	4.53	VHA
visual impact	4.55	4.54	4.52	4.54	4.55	4.54	VHA
<i>Total</i>	4.54	4.53	4.53	4.54	4.54	4.53	VHA
<i>Overall Average</i>	4.53						
<i>Interpretation</i>	Very Highly Acceptable						

Legend:

X	SUM	1.50	2.49	LA	Less Acceptable
%	Percentage	1.00	1.49	NA	Not Acceptable
VD	Verbal Description				
4.50	5.00	VHA	Very Highly Acceptable		
3.50	4.49	HA	Highly Acceptable		
2.50	3.49	A	Acceptable		

The table 6 above presents data on the level of effectiveness among students and teachers regarding the functionality and ease of use of an LED strip lighting system. It evaluates various indicators, including ease of use, efficiency, comfortability, user-friendly controls, and visual impact. We rate each indicator on a scale from Very Highly Acceptable (VHA) to Not Acceptable (NA), providing corresponding verbal descriptions. The mean ratings for each indicator fall within the VHA range, suggesting a very positive perception of the LED strip lighting system across all aspects evaluated. This indicates that both students and teachers find the system highly effective, user-friendly, and visually appealing. The overall average rating further reinforces this positive perception, indicating that the LED strip lighting system is highly acceptable overall. In summary, the data presented in the table indicates strong satisfaction and positive reception towards the LED strip lighting system among both students and teachers, highlighting its effectiveness and ease of use in educational environments.

Significant Difference on the Level of Acceptability of the Design of Innovative Product for Instructional Technology towards the College Students

The test of significant mean difference between the respondents on the level of acceptability of the Innovative Design presented in table 7.

Table 7. SIGNIFICANT DIFFERENCE

N=112

Group	n	df	\bar{x}	S	Computed t-value	Tabulated t-value	Decision
Interior Design Technology (IDT) students	76	110	4.54	0.44	0.1975 < 1.9818		Accept H ₀
Instructors/ Professors/ Experts	36		4.52	0.61	Computed t is < than the table value of t		
Tested @ 5% level of Significant							

The table reveals that the computed value of t is 1.1975, which is less than the tabulated t-value of the same test statistics at 1.9818. This accepts the null hypothesis that there is no significant difference between the respondents' perceptions as to the extent of acceptability of the Innovative Product for Instructional Technology's design system. The indicated difference means that the two groups perceived the items in the design system as similar. The indicated difference in means was not enough to represent a real difference. This can further indicate that the respondents used innovative product design for instructional technology applications as part of the required competencies. Similarly, the instructors and professors had the opportunity to contemplate and evaluate the students' required competencies.

6. Summary of Findings

The integration of instructional technology with innovation has had a profound impact on college students. Data analytics tools expanded the students' innovative ways of working, enabling them to make data-driven decisions and adopt iterative production methods. Instructional technology also allowed students to collaborate, facilitating easy communication and effective teamwork. Additionally, it transformed students' learning experiences, exposed them to state-of-the-art equipment, enhanced entrepreneurial thinking, and encouraged continuous learning and skill development.

Observations of the innovative table show that interior design technology (IDT) students are very satisfied with its overall design, functionality, and ease of use. They appreciate the aesthetics of the desk, ergonomic shape, cable management features, and adaptability to different working environments. Students have also praised the LED strip lighting system on the table for its functionality, aesthetically pleasing effect, and visual appeal. Le et al. (2021) conducted a previous study on variations of the colorimetric characteristics of an LED, which corroborated this recent study. As for its applications, strict standards often regulate the colorimetric characteristics of the equipment, ensuring its aesthetic and visual appeal. It is because learning theory, as well as aesthetics, dictate well-crafted and attractive materials.

The research also emphasizes the substantial influence of instructional technology on motivation, participation, and collaboration, as evidenced by increased creativity, motivation, and significant collaboration among students. Malone & Lepper (1987) employ the taxonomy of intrinsic motivations for learning as a framework to evaluate the applicability of this particular theory of motivation to the process of acquiring technological knowledge. Additionally, the study emphasizes the role of instructional technology in enhancing product innovation abilities, particularly in terms of

collaboration, communication, access to information, and real-time feedback.

The data further indicates high levels of satisfaction among faculty members and professors with the design of innovative products, such as ergonomic tables and LED strip lighting systems, underscoring their effectiveness and acceptance in educational settings. Additionally, examining the significant differences in the acceptance of new product design for instructional technology between IDT students and teachers/professors reveals a growing consensus about its importance as a skill in educational settings. Anglin (1995) firmly believed that technology design is a strictly behavioral approach to learning and instruction, corroborated by his research findings.

Overall, the research findings underscore the transformative potential of instructional technology in shaping the educational landscape and fostering innovation among college students, particularly in specialized fields like interior design technology.

7. Conclusion and Recommendations

In conclusion, the research has demonstrated how instructional technology integration affects college students' product innovation processes. It has expanded its innovation techniques through the use of data analysis tools, iterative approaches, and data-driven decision-making, allowing it to make better choices during product development.

Instructional technology has also improved collaboration and communication among students, leading to better teamwork and collective intelligence. It has also transformed how students learn by exposing them to advanced tools, developing an entrepreneurial mindset, and encouraging continuous learning and skill improvement.

Students studying Interior Design Technology (IDT) have praised the innovative table for its design, functionality, and user-friendliness. Students like its attractive design, ergonomic features, cable management options, and suitability for different work environments. The integration of the LED strip lighting system has also been well-received, especially for its energy efficiency and visually striking effects.

More extensive use of instructional technology has the potential to improve students' innovation abilities and success in product design. Future research can explore additional ways to utilize instructional technology to promote active learning, collaborative problem-solving, and skill development in product innovation.

Colleges should integrate more technology-driven learning into their curricula to boost product innovation. This involves using digital platforms for group projects, immersive experiences like virtual reality, and other advanced tools. Additionally, it's crucial to provide training programs for both students and faculty to effectively utilize instructional technology, fostering an innovative atmosphere. Institutions should invest in the latest technology to equip students with skills for the digital age, enhancing their readiness for the job market.

To understand how instructional technology influences product innovation across diverse student demographics, more research is required. We should implement regular evaluation processes to continuously enhance the effectiveness of instructional technology. Establishing collaborative spaces, such as innovation labs or maker spaces, equipped with various instructional technologies, can encourage hands-on experience and collaboration in product innovation.

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