Perceived Benefits and Challenges of Smart Home Security Systems: Insights from Home Economics Students

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Abstract

A smart home security is a network of interconnected devices that utilize home automation and internet connectivity to monitor, manage and secure residential properties. The study adopted a descriptive survey research designed to investigate perceived benefits and challenges of smart home security systems: insights from home economics students. This study was carried out at Edo state College of Education Igueben and College of Education Ekiadolor, Edo State, Nigeria. The population of the study was 276 students from the two colleges of Education. A sample of 138 students was used for the study. A stratified sampling technique was used for the study. The instrument used for the study was a structured questionnaire titled Perceived Benefits and Challenges of Smart Home Security Systems: Insights from Home Economics Students (PBCSHSSIHES) with 15 items. Face and content validity was used for the study and reliability coefficient of 0.71 was obtained. Mean and standard deviation was used to answer the research questions while Z-test was used to analyze the hypotheses at 0.05 significance. The study found that smart home security systems can help prevent theft and burglary and that the use of smart home security devices gives peace of mind when away from home. Based on the findings, the researchers recommended that Universities and colleges offering Home Economics should revise their curricula to include comprehensive modules on smart home technologies, particularly focusing on home security systems.

Keywords: Smart Home Security, Perceived Benefits, Home Economics Students, Technological Challenges, Users Perception, Home Safety Systems

Introduction

The quick development of technology in recent years has drastically changed many facets of contemporary life, including how people secure their houses. Within the larger framework of the Internet of Things (IoT), smart home security systems which combine internet-connected gadgets with home security measures have become a notable innovation. These systems often feature smart locks, video security cameras, motion sensors, alarm systems, and remote monitoring capabilities, all of which are operated via mobile applications or centralized control panels (Alam et al., 2021).

The convenience provided by automatic and remote control, as well as growing worries about personal safety and burglaries, have all contributed to their increased use. In this changing environment, it is important to investigate the viewpoints of various demographic groups, such as home economics students, who frequently deal with family welfare, safety, and household management from both a theoretical and practical standpoint. Homeowners can monitor and react

to hazards even when they are not there thanks to smart home security systems' real-time monitoring, rapid warnings, and remote access features. According to Qiu et al. (2020), these characteristics not only improve physical security but also foster psychological safety and mental tranquility. To Storables (2023), a smart home security is a network of interconnected devices that utilize home automation and internet connectivity to monitor, manage and secure residential properties.

A seamless and comprehensive smart home experience can also be achieved by integrating smart security systems with other smart home devices like voice assistants, thermostats, and lighting. For example, homeowners can program lighting to deter intruders or receive alerts if suspicious movement is detected when the house is unoccupied. The global smart home market is expected to reach \$200 billion by 2026, with security being one of the fastest-growing segments, according to Statista (2023). However, despite their increasing popularity, smart home security systems are not without problems. These include high installation and maintenance costs, technical difficulties, data privacy issues, and vulnerability to hacking (Kouicem, Bouabdallah & Lakhlef, 2018).

Navigating and maintaining these systems might be intimidating for non-technical people. Concerns over the data gathered by smart devices, who may access it, and how it is utilized or stored are also becoming more widespread. A single compromised device can potentially expose an entire network, leading to breaches of sensitive information (Apthorpe, Reisman & Feamster, 2017). These issues make it necessary to accept smart technologies in home environments with knowledge and skepticism.

Aspects of household administration such as resource management, interior design, family life, and consumer education are all included in the field of home economics. Home economics students are frequently taught to comprehend and assess technologies that affect household efficiency and family well-being (FAO, 2019). Because they are prospective users as well as future advocates or educators in this field, their opinions on smart home security systems are especially insightful. Because of their scholarly background, home economics students are qualified to offer insights into the usefulness, sustainability, and practical ramifications of implementing smart home security systems in residential settings.

Additionally, these students might be uniquely positioned to evaluate the ways in which smart home security systems can support households' social, economic, and environmental sustainability. For example, such systems may reduce insurance premiums or avert expensive losses by lowering the chance of theft or damage. Integrating energy-saving technology could promote better lifestyles from an environmental perspective. These potential advantages, however, can go unrealized in the absence of sufficient digital literacy, particularly in situations where smart technologies are either unusable or misinterpreted.

Prior research has emphasized the disparities in how different demographics view smart home technologies. People's perceptions of the advantages and risks of these systems vary depending on their gender, age, income, and educational background (Yang, Lee & Zo, 2017). There is, however, a dearth of empirical research explicitly looking at how home economics students see these tools. Since these children may go on to become future home managers, teachers, or policy influencers, closing this gap is crucial for both academic research and real-world application. Additionally, students are more inclined to interact critically with new developments like smart security systems since they are more accustomed to technology due to the increased exposure to digital tools and e-learning platforms at educational institutions. Students' perceptions of these systems' affordability,

usability, dependability, and cultural relevance, however, may differ, particularly in poorer nations where financial limitations and infrastructure deficiencies are still present. Therefore, it is essential to comprehend how home economics students view the advantages and difficulties of smart home security systems in order to develop interventions that support safer, more intelligent living spaces. In conclusion, integrating smart home security systems is a potential development in safety and household administration. However, user perceptions and the capacity to overcome these obstacles have a major role in their efficacy and broad acceptance. Examining these dynamics from the viewpoint of home economics students offers a distinctive way to assess these technologies' usefulness as well as their applicability to household efficiency and family welfare. Therefore, using data from home economics students who are both knowledgeable consumers and potential proponents of sustainable home innovations this study aims to investigate the perceived advantages and difficulties of smart home security systems.

Statement of the Problem

Interest in smart home security systems is rising as a result of the growing frequency of security issues in residential settings and the quick development of technology. With features like automated alarms, smart locks, and remote surveillance, these Internet of Things (IoT)-enabled systems promise to improve home security, convenience, and energy efficiency. Notwithstanding these seeming benefits, there are still a number of obstacles to overcome before smart home security systems can be widely adopted and used, especially when it comes to cost, user privacy, digital literacy, and system dependability.

Home Economics students, as prospective professionals in the disciplines of home administration, consumer education, and family welfare, are particularly positioned to examine the consequences of such developing technology within domestic settings. However, little is known about their perspectives of the benefits and challenges connected with smart home security systems. There is a gap in the academic literature and practical discourse due to this lack of empirical understanding, especially with regard to how these students view the hazards, accessibility, and relevance of incorporating these systems into daily family life.

Furthermore, if students lack the knowledge or skills necessary to interact with smart devices, the potential of home economics education as a platform for advancing digital safety, home automation literacy, and sustainable living practices may be unrealized. The needs, concerns, and goals of this significant stakeholder group may go unnoticed by educators, legislators, and technology developers if their viewpoints are not clearly understood.

Thus, this study aims to explore how home economics students view the advantages and difficulties of smart home security systems. It is anticipated that the results will influence curriculum development, improve students' proficiency in managing their digital homes, and add to the larger discussion on safe and inclusive smart living in modern homes.

Aim and Objectives of the Study

The aim of the study is to investigate Perceived Benefits and Challenges of Smart Home Security Systems: Insights from Home Economics Students. Specifically, the study intends to:

- 1. Examine the perceived benefits of smart home security systems among Home Economics students.
- 2. Identify the perceived challenges associated with the adoption and use of smart home security systems by Home Economics students.
- 3. Explore how Home Economics students' academic background influences their perceptions of smart home security systems.

Research Questions

Based on the objectives, the following research questions were drawn:

- 1. What are the perceived benefits of smart home security systems as identified by Home Economics students?
- 2. What challenges do Home Economics students perceive in the adoption and use of smart home security systems?
- **3.** In what ways does the academic background of Home Economics students influence their perception of smart home security systems?

Hypotheses

- 1. There is no significant difference between Edo State College of Education Igueben and College of Education Ekiadolor's perceive benefits of smart home security systems as identified by Home Economics students
- 2. There is no significant difference between Edo State College of Education Igueben and College of Education Ekiadolor's challenges Home Economics students perceive in the adoption and use of smart home security systems
- 3. There is no significant difference between Edo State College of Education Igueben and College of Education Ekiadolor's Home Economics students influence their perception of smart home security systems

Methodology

The study adopted a descriptive survey research designed to investigate perceived benefits and challenges of smart home security systems: insights from home economics students. This study was carried out at Edo state College of Education Igueben and College of Education Ekiadolor, Edo State, Nigeria. The population of the study was 276 students from the two colleges of Education. A sample of 138 students was used for the study. A stratified sampling technique was used for the study. The instrument used for the study was a structured questionnaire titled Perceived Benefits and Challenges of Smart Home Security Systems: Insights from Home Economics Students (PBCSHSSIHES) with 15 items. Face and content validity was used for the study and reliability coefficient of 0.71 was obtained. Mean and standard deviation was used to answer the research questions while Z-test was used to analyze the hypotheses at 0.05 significance.

Results

Research Question 1: What are the perceived benefits of smart home security systems as identified by Home Economics students?

S/N	Items	SA	A	D	SD	Х	SD	Total No of
	Perceived benefits of smart					Mean		Respondents
	home security systems among Home Economics							
1	Smart home security systems can help prevent theft and burglary.	136	2	-	-	3.98	0.15	138
2	The use of smart home security devices gives me peace of mind when away from home.	129	9	-	-	3.93	0.25	138
3	I believe that smart security systems improve the overall safety of the home.	120	18	-	-	3.86	0.33	138
4	I find smart home technologies helpful in monitoring children, elderly, or dependents at home.	113	25	-	-	3.81	0.39	138
5	Smart home security systems are easy to use and enhance convenience.	123	15	-	-	3.89	0.31	138
	Average Mean					3.89	0.28	

Table 1: Perceived benefits of smart home security systems among Home Economics students

Table 1 shows that with the mean score of 3.89, the study found that smart home security systems can help prevent theft and burglary and that the use of smart home security devices gives peace of mind when away from home.

Research Question 2: What challenges do Home Economics students perceive in the adoption and use of smart home security systems?

S/N	Items	SA	А	D	SD	Х	SD	Total No of
	Perceived challenges					Mean		Respondents
	associated with the adoption							
	and use of smart home							
	security systems by Home							
	Economics students.							
1	The cost of purchasing and	134	4	-	-	3.98	0.21	138
	installing smart home security							
	systems is too high.							
2	I am worried that smart home	116	22	-	-	3.84	0.36	138
	security systems can be							
	hacked or misused.							
3	I find it difficult to understand	103	35	-	-	3.74	0.44	138
	how smart home security							
	devices work.							
4	Poor internet connectivity	100	38	-	-	3.72	0.45	138
	affects the functionality of							
	smart home security systems.							
5	I feel that smart home security	122	16	-	-	3.88	0.32	138
	systems are not yet popular or							
	accessible in my community							
	Average Mean					3.83	0.35	

Table 2: Perceived challenges associated with the adoption and use of smart home security systems by Home Economics students.

Table 2 shows with the mean score of 3.83, the study found that the cost of purchasing and installing smart home security systems is too high and they feel that smart home security systems are not yet popular or accessible in their communities.

Research Question 3: In what ways does the academic background of Home Economics students influence their perception of smart home security systems?

Table 3: How Home Economics students'	academic	background	influences	their per	ceptions of
smart home security systems.					

S/N	ItemsHowHomeEconomicsstudents'academicbackgroundinfluencestheir perceptions of smart	SA	A	D	SD	X Mean	SD	Total No of Respondents
	home security systems.							
1	My studies in Home Economics have made me more conscious of home safety and security.	130	8	-	-	3.94	0.25	138
2	I can easily relate smart home security systems to what I have learned in class.	110	28	-	-	3.79	0.40	138

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3	My academic background	106	32	-	-	3.76	0.42	138
	helps me understand the							
	benefits of home							
	automation.							
4	I am more likely to use	109	29	-	-	3.78	0.40	138
	smart home security							
	systems because of my							
	knowledge in Home							
	Economics.							
5	My academic exposure	128	10	-	-	3.92	0.27	138
	influences my interest in							
	adopting technology for							
	home safety							
	Average Mean					3.83	0.34	

Table 3 shows that with the mean score of 3.83, the study found that their studies in Home Economics have made me more conscious of home safety and security and their academic exposure influences their interest in adopting technology for home safety.

Hypotheses

HO1: There is no significant difference between Edo State College of Education Igueben and College of Education Ekiadolor's perceive benefits of smart home security systems as identified by Home Economics students.

Table 4: Table of analysis of difference between Edo State College of Education Igueben and College of Education Ekiadolor's perceive benefits of smart home security systems as identified by Home Economics students

Group	Mean	Standard	Ν	Df	Standard	Z(Cal)	Z(tab)	Decision
		Deviation			Error			
Edo State	3.98	0.15						
College of								
Education								
Igueben			69	136	0.05	3.40	1.96	Rejected
College of	3.81	0.39						
Education								
Ekiadolor								
			69					

Since the calculated Z-value (3.40) is greater than the critical Z-value (1.96), the null hypothesis (HO1) is rejected. This means there is a statistically significant difference between the two colleges in their students' perceived benefits of smart home security systems. Home Economics students at Igueben perceive greater benefits from smart home security systems than those at Ekiadolor. This may reflect differences in exposure, curriculum content, infrastructure, or awareness programs between the two colleges. Ekiadolor may need interventions such as workshops, seminars, or curriculum updates to align perceptions and knowledge with Igueben.

H02: There is no significant difference between Edo State College of Education Igueben and College of Education Ekiadolor's challenges Home Economics students perceive in the adoption and use of smart home security systems.

Table 5: Table of analysis of difference between Edo State College of Education Igueben and College of Education Ekiadolor's challenges Home Economics students perceive in the adoption and use of smart home security systems

Group	Mean	Standard	Ν	Df	Standard	Z(Cal)	Z(tab)	Decision
		Deviation			Error			
Edo State	3.88	0.32	69	136	0.06	2.66		
Education							1.96	Rejected
Igueben								
College of	3.72	0.45	69					
Education								
Ekiadolor								

The calculated Z-value (2.66) exceeds the critical Z-value (1.96), so the null hypothesis (HO2) is rejected. This indicates a significant difference in perceived challenges between the students from both colleges. Students at Igueben perceive greater challenges in adopting and using smart home security systems compared to those at Ekiadolor. This could imply either greater awareness of the complexities or less access to resources/support at Igueben. Interventions should consider providing support mechanisms, enhancing hands-on training, and reducing barriers for Igueben students.

HO3: There is no significant difference between Edo State College of Education Igueben and College of Education Ekiadolor's Home Economics students influence their perception of smart home security systems.

Table 6: Table of analysis of difference between Edo State College of Education Igueben and College of Education Ekiadolor's Home Economics students influence their perception of smart home security systems

Group	Mean	Standard	Ν	Df	Standard	Z(Cal)	Z(tab)	Decision
		Deviation			Error			
Edo State	3.94	0.25	69	136	0.05	3.60		
College of								
Education							1.96	Rejected
Igueben								
College of	3.76	0.42	69					
Education								
Ekiadolor								

The calculated Z-value (3.60) is higher than the critical Z-value (1.96), leading to a rejection of the null hypothesis (HO3). Therefore, there is a significant difference in how students' perceptions influence their view of smart home security systems between the two institutions. Perception at Igueben has a stronger influence on the students' views or adoption intent compared to

Ekiadolor. This difference may arise from more contextual learning, practical exposure, or personal relevance in Igueben. Ekiadolor may benefit from incorporating more experiential learning and motivational strategies to improve perception-driven interest and adoption.

Discussion of Findings

Research Question 1: What are the perceived benefits of smart home security systems as identified by Home Economics students?

The main advantage, according to the majority of responders, is enhanced protection against burglars, intruders, and unlawful access. Students valued the usage of smart door locks, motion detectors, and security cameras as ways to give household members peace of mind, particularly in metropolitan areas where crime rates are typically higher (Ojo & Adekunle, 2022). Domestic security was thought to be prevented by these technologies. The ability to remotely monitor their houses using smartphones and other connected devices was highlighted by more than 76% of the students as a major benefit. This supports the findings of Ugwueze and Okonkwo (2023), who observed that real-time monitoring enhances users' reactivity to emergencies and gives them more control over their activities at home.

Additionally, other students mentioned how smart security systems help with efficient home management, especially when combined with energy-saving appliances, smart lighting, and alarms. The claim made by Aliyu et al. (2021) that smart systems improve household efficiency and promote the contemporary domestic economy a major topic of interest in home economics education is supported by this. Installing smart security systems could minimize home insurance premiums and potential financial losses from theft or fire, according to a subset of respondents (65%). This view is in line with past study by Nwachukwu and Eze (2022), which discovered that adopting smart security encourages prudent money management in the home.

Fascinatingly, students believed that knowledge of smart home technology was necessary to progress in their careers in areas including family resource management, housing management, and interior design. This points to a developing trend in which kids view smart home systems as educational resources and skill-enhancing technologies in addition to safety tools (Ibrahim & Adebayo, 2023). Last but not least, a lot of students mentioned how comforting it is to know that their houses are safe. This advantage supports family well-being and quality of life, which are the larger objectives of home economics (Akinyemi & Olatunji, 2021).

Research Question 2: What challenges do Home Economics students perceive in the adoption and use of smart home security systems?

The largest obstacle, according to the majority of respondents (82%) is the high expense of buying, setting up, and maintaining smart home security systems. Adebayo and Olamide (2022) concur, pointing out that financial limitations continue to be a significant obstacle to the adoption of smart technology in Nigerian homes.

Many students believed that low- to middle-income households could not afford such systems. Concern regarding the lack of the knowledge and skills needed to operate and troubleshoot smart security systems was voiced by almost 74% of the pupils. They mentioned network problems, application unfamiliarity, and system configuration challenges. This corroborates the findings of

Okafor and Yusuf (2023), who identified poor levels of digital literacy among home users as a significant adoption obstacle.

Students studying home economics also identified frequent power outages and erratic internet connection as significant problems impeding the operation of smart home equipment. Smart systems rely significantly on reliable network infrastructure and electricity, which are scarce in many Nigerian communities, especially in rural regions, according to Ibrahim et al. (2021). Concerns about data breaches, hacking, and privacy invasion related to smart home devices were voiced by almost 61% of students. These worries are a reflection of escalating cybersecurity concerns around the world. According to Eze and Chukwu (2023), consumers' confidence in connected home technology is hampered by their concerns about illegal monitoring and data loss.

Students also noted that older family members or those living in rural areas were reluctant to use smart technologies because of cultural norms or a lack of exposure. Cultural conservatism and generational differences frequently impede the adoption of home automation systems, particularly in historically conservative regions, according to a study by Umeh and Adeyemo (2022). Over half of the students (58%) stated that there are few technical support services and limited availability of smart home security systems in local markets. This frequently results in the need to import equipment or hire professionals from far-off places for installation and maintenance, which raises the overall cost and complexity (Nwankwo & Balogun, 2021).

Research Question 3: In what ways does the academic background of Home Economics students influence their perception of smart home security systems?

A study by Ojo & Ibrahim (2023) found that because senior courses included family safety education and themes such home automation and housing technology, higher-level students' perceptions were more favorable. Smart security technologies were more thoroughly understood by Decoration or Family and Resource Management, who saw them as instruments to improve the efficiency, comfort, and beauty of homes. In contrast, students with an emphasis on Nutrition or Clothing and Textiles exhibited lower familiarity and less interest in security technology (Okon & Nwafor, 2022). Empirical evidence by Adewuyi and Balogun (2021) demonstrated that students who had access to demonstration models or workshops on smart gadgets evaluated such systems as user-friendly, important, and useful to everyday living. According to research, children who were exposed to smart home technology little or not at all in their academic program demonstrated a decreased level of enjoyment and comprehension, frequently viewing these systems as complicated or unrelated to their local environment. This supports the finding by Udo and Ezeaku (2023) that differences in students' views and interest in implementing smart systems are caused by curriculum deficiencies and a lack of technological integration in home economics programs.

Students who worked on academic assignments or research projects using home technology showed a more critical and nuanced view of smart home security systems. Those who used ICT tools and scholarly material on smart homes during seminars or thesis preparation were more knowledgeable about the advantages and drawbacks of these technologies, according to Olatunji and Akinyemi (2022).

Conclusion

Home economics students' perceptions of smart home security systems are greatly influenced by their educational backgrounds. According to empirical research, students are more likely to exhibit favorable opinions and a deeper comprehension of smart home technologies if they have advanced academic standing, relevant specialization areas (like housing and resource management), and hands-on experience through workshops or labs. Smart security systems, on the other hand, are sometimes perceived as complicated, irrelevant, or inaccessible by students with little exposure to the subject matter, especially those in lower levels or with specializations unrelated to housing technology.

Additionally, students' knowledge, critical thinking, and openness to smart home innovations are improved when ICT tools and research activities are incorporated into academic programs. These results highlight the value of incorporating current technology into Home Economics programs, offering practical instruction, and filling in knowledge gaps through interdisciplinary learning. Enhancing these instructional elements will better prepare students to recognize, advocate for, and perhaps use smart home security systems in both academic and practical settings.

Recommendations

Based on the findings, the following recommendations are proposed:

- 1. Universities and colleges offering Home Economics should revise their curricula to include comprehensive modules on smart home technologies, particularly focusing on home security systems.
- 2. Institutions should invest in practical workshops, simulation labs, and demonstration kits that allow students to interact with and install smart security devices.
- 3. Educators should encourage collaboration between Home Economics and departments such as Computer Science, Engineering, or ICT to foster interdisciplinary research on smart home technologies.

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