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Affordability of Laptops and its Impact on BSCS Freshman Students Learning

Janseen Rey B. Resnera[1], Rhyan James M. Labola[2], Jessica Rose E, Fernandez[3]
BSCS Students, College of Computing and Information Sciences
Surigao Del Norte State University, Surigao City, Philippines[1'2]
Faculty, College of Computing and Information Sciences
Surigao Del Norte State University, Surigao City, Philippines[3]
janseenresnera2007@gmail.com rhyanlabola@gmail.com jfernandez@ssct.edu.ph

Abstract: *This study examined the affordability of laptops and its impact on the learning of Bachelor of Science in Computer Science (BSCS) freshman students. The research aimed to determine how access to affordable laptops influences students' academic performance, digital literacy, and overall learning experiences. Specifically, the study focused on the availability of affordable laptop options and financial support as factors affecting students' ability to acquire laptops for academic use.*
A descriptive quantitative research design was used in the study. Data were gathered through survey questionnaires distributed to 37 selected BSCS freshman students using simple random sampling. The responses were analyzed using frequency, percentage, weighted mean, and Pearson correlation to determine the relationship between laptop affordability and learning outcomes.

Keywords: Affordability of laptops and its impact on BSCS freshman students learning

I. INTRODUCTION

Access to technology is increasingly essential for university students, yet disparities in access persist. The new "Used Laptops for BScs Students Program" was initiated to address this gap by selling used laptops to students at Surigao del Norte State University (SNSU) at low cost. This thesis shared the program's development, the challenges encountered, and the insights gained, offering valuable understanding on the impact of this program on students and guidance for institutions looking to implement similar initiatives.

This is an impact for the computer science students because not everyone can afford a laptop and this impact students to lack on practice programming and make power point presentations to make reports. Also, it enhances our problem-solving skills and programming skill

Despite program implementation challenges, such as laptop issues and late advertising, the program has proven effective in making technology more accessible. It also provides a model for other institutions seeking to implement similar initiatives. Future research focused on improving survey response rates and expanding the program's reach to better understand its broader impact on student success.

Objective of the study

The objectives of this study were:

1. To Analyze the Impact of Laptop Affordability on Learning Outcomes
2. To Identify Barriers to Laptop Access
3. To Compare Affordability and Impact Across Different Demographics
4. To Evaluate the Long-Term Effects of Laptop Affordability on Career Prospects
5. To Provide Recommendations for Educational Institutions and Policymakers

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II. RELATED LITERATURE

Review of related studies

Information and Communications Technology can impact the learning of students. As per the latest research we found that when educators are digitally literate and trained to use digital devices for teaching can lead to higher order thinking skills, it provides creative and personalized options for students to express their understanding, and leave students better prepared to manage ongoing technical change in the world and the workplace. For this revolution in education India needs cost effective and innovative educational devices. Technology played an important role in STEM education. We designed a low cost educational laptop for schools, students and educators. This educational laptop had good connectivity, processing power, and ease of use. Features of physical computing boosted the creativity and programming skills of the young scholars.

Research Gap

Previous studies have shown how important technology is in education and the role of digital tools in improving student learning. Some research has looked at access to computers and internet connectivity in general academic settings. However, few studies focus specifically on the affordability of personal laptops and how it directly affects the learning experience of Computer Science students, especially in developing or resource-limited educational institutions.

Synthesis

Research shows that digital divides and inequalities are related to lower socioeconomic status and detrimental to social and economic capital acquisition. Other studies show that use of information and communication technologies in the classroom can lead to worse academic performance.

Affordable laptops are especially important because computer science courses require continuous practice in programming and software development. Students often use applications such as coding environments, compilers, and database systems that demand devices with moderate specifications. However, many freshmen come from families with limited financial resources, making it difficult to purchase high-performance laptops. This financial challenge may reduce students' ability to participate fully in laboratory activities, complete projects efficiently, and improve their programming skills

III. METHODOLOGY

This chapter presents the research methodology used in the study entitled "Affordability of Laptops and Its Impact on BSCS Freshman Students' Learning." It discusses the research design, conceptual framework, respondents of the study, sampling techniques, research instrument, data gathering procedure, statistical tools used, and ethical considerations. The purpose of this chapter is to explain the methods and procedures used by the researchers in gathering and analyzing the data needed for the study.

Conceptual Framework

The conceptual framework illustrated how the affordability of laptops influenced the learning experience of BSCS students.

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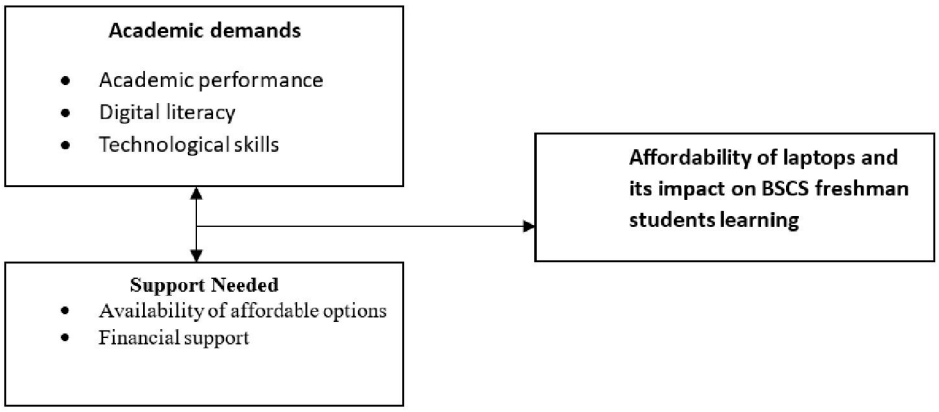

Fig. 1 Conceptual Framework of the Study

This conceptual framework illustrates how two interrelated factors academic demands and the support needed to meet them converge to influence the central issue of laptop affordability and its impact on BSCS freshman students' learning. On one side, academic demands encompass the performance expectations placed on students, along with the digital literacy and technological skills required to succeed in a computer science program. These demands inherently require access to adequate technology, since BSCS coursework typically involves programming, software development, and other computer-intensive tasks.

On the other hand, support needed represents the resources that help students meet those demands, specifically the availability of affordable laptop options and financial support mechanisms (such as subsidies, payment plans, or institutional assistance programs).

The bidirectional arrow between these two boxes indicates a reciprocal relationship: academic demands create the need for support, while the level of support available shapes whether students can actually meet those academic demands. For instance, if academic performance requires strong digital literacy, but a student lacks financial support to acquire a suitable laptop, their ability to develop that literacy and meet performance standards is compromised. Conversely, the type and intensity of academic demands determine what kind of support (and how much) is necessary.

Both factors then feed into the central focus of the study: how the affordability of laptops affects BSCS freshman students' learning. This suggests the researchers are positioning affordability not as an isolated variable, but as something shaped by the interplay between what students are expected to do academically and what resources are available to help them do it. The framework implies that addressing learning outcomes related to technology access requires looking at both sides of this equation, raising support (financial aid, affordable options) while being mindful of the academic skills and performance students are expected to demonstrate.

This type of framework is useful for guiding research questions, such as examining whether students with laptop access perform better academically, whether financial constraints correlate with lower digital literacy, or whether institutional support programs effectively bridge the affordability gap for incoming CS students.

Research Design

According to Creswell and Creswell (2018), quantitative research is a method used to test objective theories by examining the relationship among variables. The descriptive quantitative research design was appropriate for this study because it allowed the researchers to gather measurable data regarding laptop affordability and its impact on students' learning.

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Similarly, Calderon and Gonzales (2019) explained that descriptive research is commonly used to describe existing conditions and determine relationships among variables. In this study, the researchers described the experiences of BSCS freshman students in relation to laptop affordability and academic learning.

Respondents of the Study

The respondents of this study were selected BSCS freshman students from the college department. The respondents were chosen because they are directly affected by the issue of laptop affordability in their academic activities.

The researchers targeted freshman students because they are still adjusting to the technological demands of the BSCS program. Their responses provided relevant information regarding the importance of laptops in their learning experiences.

Part I – Demographic Profile

This section gathered information such as:

- Age
- Gender
- Monthly family income
- Laptop ownership status

Part II – Research Questions

This section contained statements related to:

- Laptop affordability
- Financial support
- Academic performance
- Learning experiences

The researchers used a Likert Scale to measure the respondents' level of agreement with each statement.

Likert Scale

The study used the 4-point Likert Scale developed by Rensis Likert to measure attitudes and opinions.

Scale	Verbal Interpretation
4	Strongly Agree
3	Agree
2	Disagree
1	Strongly Disagree

The Likert Scale was used because it allows respondents to express their perceptions and experiences regarding laptop affordability and learning.

Data Gathering Procedure

The researchers followed the following procedures in gathering the data:

- The researchers prepared a formal letter requesting permission to conduct the study.
- After approval, the survey questionnaires were distributed to the selected BSCS freshman students.
- The respondents were informed about the purpose of the study and were asked to answer honestly.
- The researchers collected the completed questionnaires and organized the responses for analysis.
- The gathered data were tabulated and interpreted using statistical tools.

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Statistical Tools Used

This study utilized frequency and percentage to describe the demographic profile of the respondents, including their age, gender, and laptop ownership status. The percentage was computed using the formula $P = (f/N) \times 100$, where P represents the percentage, f represents the frequency of responses, and N represents the total number of respondents. In addition, the weighted mean was employed to determine the average responses of the participants regarding the affordability of laptops and its impact on their learning, allowing the researcher to assess the overall level of agreement or perception among respondents on each item in the survey.

Interpretation of Weighted Mean

Weighted Mean Range	Verbal Interpretation
3.26 – 4.00	Strongly Agree
2.51 – 3.25	Agree
1.76 – 2.50	Disagree
1.00 – 1.75	Strongly Disagree

These interpretations served as the basis for analyzing the responses of the participants regarding the affordability of laptops and its effects on their academic learning and experiences. determine the overall perception of students regarding the study variables.

IV. RESULTS AND DISCUSSIONS

This chapter presents the data gathered from the respondents, the analysis of the results, and the interpretation of the findings regarding the affordability of laptops and its impact on the learning of BSCS freshman students.

Profile of the Respondents

The profile of the respondents is presented in terms of age, gender, and section, as shown in the tables below.

Table 1 presents the distribution of respondents according to age.

Age	Frequency	Percentage
18	17	45.95%
19	13	35.14%
20	3	8.11%
22	3	8.11%
29	1	2.70%
Total	37	100%

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Table 1 shows the age distribution of the respondents. The data reveals that the majority of the respondents are 18 years old, accounting for 45.95% of the total population. This is followed by 19-year-olds at 35.14%. This indicates that the respondents are within the typical age bracket for first-year college students.

Table 2. Distribution of Respondents according to Gender

Gender	Frequency	Percentage
Male	22	59.46%
Female	14	37.84%
Others	1	2.70%
Total	37	100%

Table 2 presents the gender of the respondents. Out of 37 respondents, 22 are male (59.46%), while 14 are female (37.84%). One respondent preferred not to specify a standard gender category (2.70%). This shows that the BSCS freshman population in this study is predominantly male.

Availability of Affordable Options

This section discusses the impact of affordable laptop options on students' academic performance and digital literacy.

Table 3. Impact of Availability of Affordable Options on Student Learning

Indicators	Mean	Interpretation
Academic Performance		
1. I have access to an affordable laptop.	3.22	Agree
2. Personal laptop makes it easier for me to complete virtual lab simulations.	3.38	Agree
3. Sharing or borrowing a laptop improves my performance and skills during lab activities.	3.05	Agree
Subscale Mean	3.22	Agree
Digital Literacy and Technological Skills		

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Indicators	Mean	Interpretation
4. It enhances my academic grades than those without.	3.19	Agree
5. The performance of my activity enhances my academic grades in programming-related subjects with a proper laptop.	3.35	Agree
6. My overall academic performance improves when I have regular access to a laptop.	3.39	Agree
Subscale Mean	3.31	Agree

Table 3 shows the mean scores for the availability of affordable options. The subscale mean for Academic Performance is 3.22, while Digital Literacy and Technological Skills obtained a subscale mean of 3.31, both interpreted as "Agree". This implies that students recognize a direct link between having an affordable laptop and their ability to perform well in programming and laboratory tasks.

Financial Support

This section highlights how financial aid influences the students' ability to acquire necessary technology.

Table 4. Impact of Financial Support on Student Learning

Indicators	Mean	Interpretation
Academic Performance		
1. Helps me afford laptops.	3.43	Agree
2. Helps student acquire laptop.	3.41	Agree
3. Improve student access to laptop.	3.38	Agree
Subscale Mean	3.41	Agree
Digital Literacy and Technological Skills		
4. Access to financial assistance for laptop purchases positively affects students'	3.41	Agree

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Indicators	Mean	Interpretation
performance.		
5. Financial support programs improve students' participation in academic activities.	3.32	Agree
6. Helps students acquire laptops for better technological abilities.	3.43	Agree
Subscale Mean	3.39	Agree

Table 4 presents the data regarding financial support. The Academic Performance subscale mean is 3.41, and the Digital Literacy subscale mean is 3.39. Both results fall under the "Agree" interpretation. This suggests that students view financial assistance as a crucial factor in acquiring laptops, which in turn enhances their participation and skills in academic activities.

Relationship Between Variables

This section presents the statistical analysis used to determine if a significant relationship exists between the affordability of laptops and the learning outcomes of BSCS freshman students. The Null Hypothesis (H_0) states that there is no significant relationship between these variables.

Table 5. Correlation Matrix: Laptop Affordability vs. Student Learning

Independent Variable	Pearson r	p-value	Interpretation	Decision
Availability of Affordable Options	0.792	< .001	Significant	Reject H_0
Financial Support	0.814	< .001	Significant	Reject H_0

Based on the statistical analysis, all p-values are less than the 0.05 level of significance. Therefore, the Null Hypothesis (H_0) is REJECTED. This indicates that there is a significant relationship between laptop affordability factors (availability and financial support) and the learning impact on BSCS students. The strong r values suggest that as the accessibility and financial feasibility of acquiring a laptop improve, the students' academic performance and digital literacy also increase significantly.

The results imply that for BSCS freshman students, the presence of affordable hardware and the availability of financial assistance programs are critical drivers for their success in programming and technical laboratory simulations. As these factors improve, students are better equipped to meet the technical demands of the curriculum.

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V. CONCLUSION AND RECOMMENDATIONS

Conclusion

This study focused on the affordability of laptops and its impact on the learning of BSCS freshman students. Based on the gathered data and analysis presented in Chapter 4, the researchers concluded that laptop affordability plays a significant role in the academic performance, digital literacy, and overall learning experience of students in the Bachelor of Science in Computer Science program.

The findings revealed that most respondents agreed that having access to affordable laptops improves their ability to complete programming activities, laboratory simulations, research tasks, and other academic requirements. Students with regular access to laptops were able to participate more actively in learning activities and showed better confidence in using technology-related applications. The results also showed that laptop ownership positively affects students' digital literacy and technological skills, which are essential in the BSCS program.

Furthermore, the study found that financial support greatly helps students acquire laptops and improve their participation in academic tasks. Financial assistance programs, affordable laptop options, and support from institutions contribute significantly to students' academic success. The correlation analysis also confirmed that there is a significant relationship between laptop affordability and student learning outcomes. This means that when students have better access to affordable laptops and financial support, their academic performance and technological skills also improve.

The researchers therefore conclude that laptop affordability is an important factor in enhancing the quality of learning among BSCS freshman students. Lack of access to laptops may create difficulties in completing academic requirements, reduce opportunities for programming practice, and negatively affect students' performance in computer-related subjects.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. Educational institutions should implement laptop assistance programs.
2. Schools and universities may provide affordable installment plans, laptop loan programs, or scholarship assistance to help financially challenged students acquire laptops for academic use.
3. The institution should improve computer laboratory accessibility.
4. Since not all students can immediately afford laptops, schools should enhance laboratory facilities and extend laboratory hours to provide students with enough time to complete programming activities and assignments.
5. Government agencies and private organizations should provide financial support.
6. Financial aid programs, subsidies, and sponsorships for educational technology should be strengthened to help students access essential digital learning tools.
7. Students should maximize available learning resources.
8. Students are encouraged to utilize free educational software, open-source programming tools, and online learning platforms to improve their technical skills despite financial limitations.
9. Future studies may include larger populations, other academic programs, and additional variables such as internet accessibility, device specifications, and online learning experiences to gain deeper understanding of technology affordability in education.
10. Parents and guardians should support students' technological needs whenever possible.
11. Providing students with access to laptops or other digital devices can greatly help them perform better academically and develop their technological competencies.

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