

Enhancing Computer Literacy of Grade 11 Students through Digital Learning Resource – Project Basics (Beginners’ Aid from School that Imparts Computer Skills)

Clarissa A. Dabu¹, Leo Brian H. Maranan, Gilbert R. Escala,³
clarissa.dabu@deped.gov.ph

¹ National Teachers College, Department of Education - Bigaa Integrated National High School

² Department of Education - Bigaa Integrated National High School

³ Department of Education - Bigaa Integrated National High School
Philippines

DOI: <https://doi.org/10.54476/apjaet/87229>

Abstract

A plethora of literature and studies recognized the positive impact of computer literacy on learners' academic performance. It is considered a backbone of sound academic performance. As one of the skills required in the 21st century, every learner should have equal access to resources and skills development. Thus, this study aimed to provide equal opportunity to learners to access digital learning resources and skills development relevant to computer literacy. Thirty students participated in the conduct of Project BASICS – Beginners' Aid from School that Imparts Computer Skills. However, only 28 were recognized as subjects in this experimental study through simple random sampling, while the remaining two were considered blind respondents. To determine the effect of the computer literacy program, the computer knowledge application was diagnosed, and a pretest and posttest were administered before and after the implementation. McNemar test results determine the difference in the computer knowledge application of students before and after the conduct of the program. Paired samples T-test rules out the difference in the pretest and post-test scores of the subjects. The significant difference in the computer knowledge applications before and after became notable. Moreover, the pretest and posttest scores differed significantly at an alpha value of $<.001$. Thus, the aim of enhancing the computer literacy of grade 11 students was attained. Using BASICS is highly recommended across grade levels to develop further students' computer literacy, which can leverage their academic performance.

Keywords: Computer Literacy, Academic Performance, 21st Century Skills

Introduction

The digital revolution has brought immense changes in all facets of life across both developed and developing countries transforming information gathering, communication processes, and learning styles of children and young adults (Proctorio, 2019). Alongside with digital revolution, digital literacy is becoming an important skill set to thrive in an ever-growing digital world. It requires individuals with skills and capabilities to be fully functional, effective, and efficient in using digital technologies (Business Mirror, 2022). Further, digital literacy refers to the capability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic and social life. It comprises various skills such as computer literacy, ICT literacy, information literacy, and media literacy (Law et.al, 2018).

Antoninis and Montoya (2018) acknowledge the relevance of digital literacy to attain the Sustainable Development Goal (SDG) target 4.4, which focuses on important skills, particularly technical and vocational skills for employment, decent jobs, and entrepreneurship. In particular, the Global Framework Reference of Digital Literacy Skills identified competence areas which are: (0) fundamentals of hardware and software, (1) information and data literacy, (2) communication and collaboration, (3) digital content creation, (4) safety, (5) problem-solving, and (6) career-related competencies (Law et.al, 2018). Each competence area has a corresponding competency that identifies the level of digital literacy attainment. Failure to possess the prerequisite area can affect the actualization of becoming a responsible digital citizen. Consistent with the attainment of digital literacy as one of the indicators of SDG 4.4, the K to 12 curricula envision Filipino learners to be equipped with digital literacy competence as they progress in the ladders of education. Grades 4 -6 pupils should be adept in using productivity tools. The 7th graders should be knowledgeable of basic programming language. Grades 8-10 students must develop their skills in multimedia. And 11th to 12th graders shall be in pursuit of the acquisition of their vocational skills.

Grade 11 and 12 students engage themselves in research-oriented courses that require ability in reading, writing, numeracy, and digital literacy skills. Four senior high school courses require students to conduct research namely, Pagbasa at Pagsusuri ng Iba't ibang Teksto tungo sa Pananaliksik, Practical Research 1, Practical Research 2, and Inquiry, Investigation, and Immersion. Researching requires an individual to possess digital skills to find relevant information from many sources (Potomac.edu, 2022). However lacking the competence of prerequisite skills can impede success in research courses and even put an individual at a disadvantage. Moreover, two other senior high school courses require digital literacy skills which greatly focus on performances that exhibit digital competence specifically the Empowerment Technology and Media and Information Literacy.

Several studies found that digital skills have a positive impact on a student's academic performance (Abbas et al., 2019; Cadiz-Gabejan & Takenaka, 2021; Pagani et al., 2016). Moreover, it is also one of the essential requirements for employment (Grant, Malloy, & Murphy, 2009). A pressing need to equip each learner with digital skills becomes a necessity along with reading, writing, and arithmetic.

Computer literacy, as one of the foundational digital skills, is increasingly vital to perform tasks easier and more conveniently. Dincer (2016), as cited by Orozco (2022), acknowledges that computer literacy is the variation of an individual's knowledge and skills in using a computer. Further, they consider it the ability to have an in-depth understanding of computer applications to accomplish tasks. Tarannum and Parikshit (2021) recognize computer literacy as the ability of an individual to use a computer. Also, even in this innovative world, some still do not know how to use computers. The 21st century has brought the world to a high level of technological advancement and is unprecedented in the history of mankind. Unfortunately, many people are still behind the trend. Even the 21st-century learners who are digital natives lack the competence to use computers in a productive way e.g. doing research. Results of the International Computer and Information Literacy study reported that only 2% of learners attained the highest levels to achieve a digital native standing, and only 19% of the 42,000 learners evaluated in 14 countries and educational institutions could independently perform computer-related tasks (Staruss, 2019). The importance of truly honing computer skills seemed to be imperative in a computer-dominated world. Hence, Indiwara et al. (2022) /acknowledge the importance of possessing computer knowledge and skills that can be used for a lifetime. Thus, improving computer literacy alongside reading, writing, and arithmetic is imperative. Although several programs that empower reading and numeracy skills are initiated in various schools in the country to meet the standards advocacy that enhances digital literacy is minimal. Even though there are competencies under the Technology and Livelihood Education subject aligned to the development of digital literacy they are partially polished among learners to attain mastery of skills because of some

factors like the ratio of computers in school to the number of learners, several competencies from various subject areas to be mastered all at once, and socioeconomic status of family among others.

Practical Research teachers in Bigaa Senior High observed that some students are unwilling to perform tasks using desktop computers because they do not have basic knowledge of hardware and productivity tools such as word processing, spreadsheets, and presentations. This response proves the inability to perform basic computer applications. According to Writer (2018), learners who lack age-appropriate computer skills, e.g. typing, online research, and discerning internet usage may be left behind and impact academic performance negatively. Cadiz-Gabejan and Takenaka (2021) point out that those who performed better in academic activities are more knowledgeable about using computers than those who do not know how to.

Data have shown that 43 learners (54%) out of 79 grade 11 students of Bigaa Integrated National High School who took the computer literacy scale test developed by Sengpiel and Jochems (2015) identified themselves as seldom to never experiencing computers, particularly in using word processing, spreadsheet, and presentation. In addition, these students scored low in assigning symbols and terms relevant to the use of electronic equipment and computers. This group of learners was the participants of modular distance learning during the pandemic. Their apprehension when faced with computer performance tasks only proves the existence of learning and skills gaps. The discrepancy between what they had learned to the expected competencies that they should possess draws a vivid picture of learning loss during the pandemic. However, the existence of this phenomenon should not be solely blamed on the learning modality they opted for during the COVID crisis. Data have shown that most of the grade 11 students for the school year 2022-2023 belonged to the below poverty line which accounts for 54.7%. The unavailability of devices to enhance learning can also be considered a barrier, especially with the kind of learners at present who have various learning preferences. Some are already satisfied with reading materials, but others are in a visual and auditory inclination.

Objectives of the Study

The direction of education is heading toward normality, it is high time to go back to the mastery of basics to address the circumstances. Thus, this study aimed to enhance the computer literacy of grade 11 students through a digital learning resource. It specifically pursued to answer the following research objectives;

- 1) determine the computer knowledge applications of the subjects before and after the computer literacy program
- 2) evaluate the computer literacy scores of the subjects in the pretest and post-test
- 3) determine the significant difference between the computer knowledge application before and after the computer program
- 4) analyze the significant difference between the pretest and post-test scores

The computer program initiative was conceptualized to bridge the gap by utilizing BASICS, which stands for Beginners' Aid from School that Imparts Computer Skills. Project BASICS envisions developing foundational digital skills and providing equitable access to computer education to SHS students to be productive in their research courses and to improve their academic performance further.

Methodology

This study was designed on a quantitative research framework particularly experimental shaped by a one-group pretest and post-test design. In this design, the dependent variable was measured before the implementation of the computer literacy program and tested once again after the implementation.

Among the forty-three expected beneficiaries, some did not continue to the second semester and others were working students. Their working time conflicted with the implementation time which was usually after class and sometimes during Saturdays. Thus, only thirty students (70%) were involved. Among these, only twenty-eight (28) were considered as subjects of the experimental study with the use of a simple random sampling, and the remaining two were considered as blind respondents.

Research instruments utilized in this study were the Computer Literacy Scale developed by Sengpiel and Jochems (2015), the teacher-made list of computer knowledge applications, and the teacher-made pretest and posttest. The teacher-made tools and the BASICS digital learning resources underwent rigorous validation by the school learning resource quality assurance team.

The procedure of this research started with the identification of grade 11 students who strongly need computer skills enhancement training through the administration of an initial assessment which was the computer literacy scale developed by Sengpiel and Jochems (2015). Informed consent of students and parents was secured. Consent to implement the study was sought from the office of the school head. Upon issuance of the notice to proceed from the division office the computer literacy program started. It took a month to deliver the content of the entire program along with various assessments to determine the effect on students' computer literacy. Confidentiality of responses and scores was assured to the subjects of this experimental study.

Results and Discussion

To identify the capability of the subject to perform computer knowledge applications, a one-on-one assessment was conducted before and after the program's implementation. Results are shown in Table 1.

1. McNemar Test Results on the Capability of the Subjects in Performing Computer Knowledge Applications

Table 1

McNemar Test Results on the Capability of the Subjects in Performing Computer Knowledge Applications Before and After the Conduct of the Computer Literacy Program

No.	Basic Computer Application	Can Perform Before Project BASICS	Can Perform After Project BASICS	X ²	p
1	Identify basic computer hardware and their functions such as monitor, CPU, mouse, keyboard	8	25	17.0	<.001
2	Enumerate basic software and understand its purpose	5	20	15.0	<.001
3	Efficiently use operating system and necessary applications	4	18	14.0	<.001
4	Can locate and use keyboard keys like typing, navigation, control, and numeric keys easily	10	26	16.0	<.001
5	Can type sentences and paragraphs with appropriate capitalization and punctuation using word processing with confidence	14	27	13.0	<.001
6	Use basic shortcuts on the keyboard when performing tasks	3	22	17.2	<.001
7	Can save as file faster	14	25	11.0	<.001
8	Able to print documents instantly	3	26	23.0	<.001
9	Capable of creating tables with the application of basic formula in Excel	3	25	22.0	<.001
10	Can create a presentation using PowerPoint with theme and consideration of font size and style	6	26	20.0	<.001
11	Send and receive messages via email with ease	15	25	10.0	0.002
12	Forward messages and reply to the sender	10	22	12.0	<.001
13	Attach files to an email	3	26	23.0	<.001
14	Edit documents on Google Drive instantly	3	26	23.0	<.001
15	Can upload and download file from Google Drive	3	26	23.0	<.001

Table 1 reports the positive effect of Project BASICS that enhanced the computer literacy of students. McNemar was used to justify the difference in the computer knowledge applications of the subjects before and after the administration of Project BASICS occurred. The results revealed that students' computer knowledge applications improved significantly.

These results substantiate the idea that emphasizes the favorable consequence of providing quality and genuine learning support to students in enhancing their capability to perform challenging tasks. Moreover, Allington (2013), as cited by Young et al. (2020) highly considered the importance of detecting learners who need necessary intervention, and providing them with guided and appropriate learning materials would yield a positive effect.

2. Computer Literacy Scores of the Subjects in Pretest and Posttest

Table 2
Paired Sample T-Test Results Using Posttest and Pretest Scores of the Subjects

			statistic	df	p	Mean difference	SE difference
Posttest	Pretest	Student's t	28.3	27.0	< .001	15.1	0.532

Note. $H_a \mu_{\text{Measure 1}} - \mu_{\text{Measure 2}} \neq 0$

The key objective of this study is to judge the effectiveness of Project BASICS on students' computer literacy using a digital learning resource through a series of hands-on activities designed by teacher researchers. Computer literacy was measured using a 35-item teacher-made test. Results of the tests were subjected to the Shapiro-Wilk test of normality, which revealed that the assumption was not violated, $W = 0.95$, $p = 0.18$.

The result of the paired samples t-test as shown in Table 2 reveals that significant difference between the subjects' computer literacy before ($M = 8.82$, $SD = 5.22$) and after ($M = 23.89$, $SD = 5.86$) the administration of Project BASICS, $t(28) = 28.3$, $p < .001$. As stated by Brooks et.al (2021), considering the level of students, providing sufficient support to learners, and administering well-planned interventions create positive and lasting effects on learners' achievement.

Conclusion

This study focused on the effect of the Beginners' Aid from School that Imparts Computer Skills in enhancing the computer literacy of Grade 11 students. To conclude, the significant difference in the computer knowledge application of students before the conduct of Project BASICS and after became highly evident. Moreover, a significant difference was also apparent in the pretest and post-test scores, confirming the positive effect of Project BASICS in enhancing the foundational digital skills of students. Therefore, the null hypothesis of no significant difference is rejected. The knowledge and skills in computer applications can leverage the students to perform better in their academics. As cited in the literature and studies that served as a springboard for this research, computer literacy positively impacts academic performance. Thus, this initiative to enhance foundational digital skills can benefit the students in their basic education and the performance of their future jobs.

Recommendations

In light of the preceding conclusion, the researchers recommend the following:

1. Utilization of Project BASICS across grade levels should be considered to enhance the foundational digital skills of students.
2. Lengthening the administration period is highly recommended to give ample time for the mastery of skills.
3. Teachers should design performance tasks demonstrating the acquired knowledge and skills in computer application.
4. Future researchers should investigate the effect of Project BASICS on the compliance and performance of student beneficiaries in their ICT and research courses.

References

- Abbas, Q., Hussain, S., & Rasool, S. (2019). Digital literacy effect on the academic performance of students at higher education level in Pakistan. *Global Social Sciences Review*, IV(I), 108–116. [https://doi.org/10.31703/gssr.2019\(IV-I\).14](https://doi.org/10.31703/gssr.2019(IV-I).14)
- Antoninis, M., & Montoya, S. (2018, March 19). *A global framework to measure digital literacy*. Global Education Monitoring Report. <https://uis.unesco.org/en/blog/global-framework-measure-digital-literacy>
- Brooks, G., Clenton, J., & Fraser, S. (2021). Exploring the importance of vocabulary for English as an additional language learners' reading comprehension. *Studies in Second Language Learning and Teaching*, 11(3), 351–376. <https://doi.org/10.14746/ssllt.2021.11.3.3>
- Cadiz-Gabejan, A. M., & Takenaka, M. J. C. (2021). Students' computer literacy and academic performance. *Journal of World Englishes and Educational Practices*, 3(6), 29–42. <https://doi.org/10.32996/jweep.2021.3.6.4>
- Indiwara, R., Istiyono, E., & Widihastuti, W. (2022). *Validating perceived ICT literacy scale for senior high school*. <https://doi.org/10.2991/assehr.k.220402.018>
- Law, N., Woo, D., & Wong, G. (2018). *A global framework of reference on digital literacy skills for indicator 4.4.2*. <http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf>
- M. Grant, D., D. Malloy, A., & C. Murphy, M. (2009). A comparison of student perceptions of their computer skills to their actual abilities. *Journal of Information Technology Education: Research*, 8, 141–160. <https://doi.org/10.28945/164>
- Najhat Tarannum, & Parikshit Mondal Dr. (2021). Assessing the computer literacy among the below poverty line (BPL) Community of Malda District. *Library Philosophy and Practice - Electronic Journal*. <https://digitalcommons.unl.edu/libphilprac/5996/>
- Orozco, J. L. (2022). Digerati: Assessment of students' computer literacy. *The International Journal of Humanities & Social Studies*, 10(4). <https://doi.org/10.24940/theijhss/2022/v10/i4/HS2204-041>

- Pagani, L., Argentin, G., Gui, M., & Stanca, L. (2016). The impact of digital skills on educational outcomes: evidence from performance tests. *Educational Studies*, 42(2), 137–162. <https://doi.org/10.1080/03055698.2016.1148588>
- Proctorio. (2019, October 18). *The 4th industrial revolution and its impact on education*. Oeb.Global. <https://oeb.global/oeb-insights/the-4th-industrial-revolution-and-its-impact-on-education/>
- Sengpiel, M., & Jochems, N. (2015). *Validation of the computer literacy scale (CLS)* (pp. 365–375). https://doi.org/10.1007/978-3-319-20892-3_36
- Staff Writer. (2018, July 28). *The danger of computer illiteracy in an increasingly digital world*. <https://www.mathgenie.com/blog/the-danger-of-computer-illiteracy-in-an-increasingly-digital-world>
- Staruss, V. (2019, November 16). *Today's Kids might be digital natives - but a new study shows the aren't close being computer literate*. <https://oeb.global/oeb-insights/the-4th-industrial-revolution-and-its-impact-on-education/>
- What is digital literacy and why is it important?* (2022, October 26). <https://potomac.edu/what-is-digital-literacy/#:~:text=It%20ensures%20users%20protect%20their,your%20digital%20literacy%2C%20read%20on.>
- Young, C., Lagrone, S., & McCauley, J. (2020). Read like me: An intervention for struggling readers. *Education Sciences*, 10(3), 57. <https://doi.org/10.3390/educsci10030057>

Copyrights

Copyright of this article is retained by the author/s, with first publication rights granted to APJAET. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution-Noncommercial 4.0 International License (<http://creativecommons.org/licenses/by/4>)