



Implications for Distance Learning: Does Demographics Impact Students' Self-Perceived Proficiency in Information Technology?

Jarrett Landor-Ngemi
Southern University A & M College

ABSTRACT

The purpose of this study is to investigate the impact of demographics on students' self-perceived proficiency in information technology and its implication for distance learning. Data for this study were collected from students in both undergraduate and graduate programs. Even though research suggests that demographics have an impact on users of information technology, this study, however, reveals no statistically significant relationship exists between demographics and students' self-perceived proficiency in information technology. The study however shows that most rated themselves as proficient in using spreadsheets, PowerPoint, conducting online research, using chat/thread discussions, and word processing while most students described themselves as below proficient in computer programming and Webpage design. This study also highlights the implications of the findings to distance learning.

Keywords: Distance Learning, Demographics, Self-Perceived, Proficiency, Information Technology

INTRODUCTION

Problem Statement

With recent expansions in internet-based instruction and with the integration of technology in teaching, proficiency in the use of information technology is very important. Distance learning has seen an increase in the past decade, especially in the past two years with the COVID-19 pandemic (Elizabeth et al, 2020; Rizaldi & Fatimah, 2020; M Paula, 2021). Distance learning also known as online learning or distance education is a form of education where the teaching and learning process occurs in a virtual or online environment with the teacher and student(s) being physically separated from each other (Boot et al, 2015; Mehran et al, 2016). Distance education systems are web-based software systems for managing, distributing, and tracking courses over the internet. With these systems, the implementation involves the use of technology to facilitate two-way communication between teachers and students. Teachers use it to direct, design, and deliver course materials over the internet while students use it to receive course materials, lectures, and take tests. It provides convenient ways to achieve learning through the use of features like chatrooms, discussion forums, polls, collaborative sharing, interactive graphics, etc. There are seven important skills needed for distance learning a) IT skills b) File management skills c) Database access skills d) PowerPoint/presentation skills e) Spreadsheet skills g) word processing skills (Mukhtar et al, 2020). A disadvantage of distance learning is that when students lack motivation, they can be lost and consequently withdraw from the course (Aithal & Aithal, 2016; Gautam & Tiwari, 2016; Axmedova & Kenjayeva, 2021). A study conducted by Barrot et al in 2021 agrees with this as their study

found that the learning environment at home can impact students' concentration or cause distractions to their learning motivation. Distance learning has been praised for its flexibility which provides learners with flexible ways of taking classes and provides equal access to information for students regardless of students' physical location, ethnic group, race, or age (Radu et al, 2011; Arkorful & Abaidoo, 2015; Mukhtar et al, 2020; Alaa-Zuhir et al, 2021). Research however shows that in developing countries where student lack reliable internet access, students have a hard time with distance learning thereby restricting their learning experience. This reveals that physical location has an impact on distance learning. In this paper, the author looks at students' self-perceived proficiency in information technology and how it is impacted by demographics and looks at the implications for distance learning.

METHODOLOGY

Research Question and Instrument

This study seeks to answer the research question: Is there a statistically significant relationship between student demographics and students' self-perceived proficiency with computer technology? The research questions used to collect data needed for this study were constructed by the researcher. The questions are divided into two sections.

1. Demographic characteristics (questions #1-10).
2. Computer proficiency (question #11 a-h).

Table 1: Internal Consistency

Variable	Questions	Cronbach's alpha
Demographic characteristics	1-10	-
Proficiency in use of Computer Technology	11 a-11 h	0.79

Research Participants

The population for this study consists of nine universities located in Louisiana, Mississippi, Alabama, Tennessee, and Maryland. The sample for this study was made up of 37 Males and 63 Females, 23 of the students were between 18-25 years, 37 of them were between 26-35 years old, 14 of them were between 36-45 years, 21 of them were between 56-75 years old while 5 of them were between 56-75 years of age. 41 of them majored in Education, 4 of them in English, 13 of them in science while 42 selected "Other" as major.

Research Design and Analysis

This study employed a quantitative research design. A multiple linear regression tested the hypothesis that there is a statistically significant relationship between the independent variable student demographics (gender, age, major course of study) and student proficiency (dependent variable) in the use of computer/information technology such as spreadsheets, word processing, slideshows, statistical programs, chat, programming, online course design, and threaded discussion. Multilinear regression commonly referred to as multiple regression is a statistical technique used in estimating the outcome of a response variable (Nikolaos, 2016).

Table 2: Mean and Standard Deviations for student computer/technical skills		
Variable	Mean	SD
Word processing	4.07	0.8
Spreadsheet	3.32	1.0
PowerPoint	4.13	0.7
Online research	4.07	0.8
Chat/thread discussion	4.20	1.2
Statistics programs	3.73	1.0
Programming	4.47	1.1
Webpage design	4.40	0.9

Note: The scale is as follows: 1 being unskilled, 2 being somewhat skilled, 3 being average, 4 being above average, and 5 being outstanding skills

RESULTS AND CONCLUSION

Students were asked to describe their computer skills based on a 5-part Likert type scale, 1 being unskilled, 2 being somewhat skilled, 3 being average, 4 being above average, and 5 being outstanding skills. Most students rated themselves as proficient in using spreadsheets, PowerPoint, conducting online research, using chat/thread discussions, and word processing; however, most students described themselves as below proficient in computer programming and Webpage design.

The results from the multiple linear regression revealed no statistically significant relationship between student demographics and computer technological skills. These demographics included age, gender, and major course of study. Therefore, when computer software designers design computer instructional interfaces, designers may not need to focus on making such platforms demographic-specific and should focus on other factors. This is an area that warrants further research and was beyond the scope of the current study. University administrators should invest in computer instructional technologies regardless of student major, age, or gender. The reality is since this is the era of web-based technology, students can greatly benefit from using this technology for learning. For example, previous studies (Isaeva et al, 2020), have found that students would rather click a link to do further research on a specific topic in their studies than go to the library. Regardless of how much students are encouraged by their professors to use the library; most students will not do so. They would rather "click and read," a phenomenon some have described as encouraging laziness on the part of the students. The researcher strongly holds to the philosophy that students must be given the freedom to learn in line with the current times and not insist that learning must be done as it was in previous decades when the only option was paper-based learning.

The implication of no statistically significant differences between males and females regarding their perceptions of quality instruction suggests that universities should seek alternatives to investing in gender-sensitive technology. In addition, the computer technology industry should cease allocating millions of dollars each year to marketing technology that is specifically catered to women if further research continues to prove that there are no differences between males

70 and females' perceptions of quality instruction using synchronous online instruction, asynchronous online instruction, and face-to-face instruction (Habiba & Ahmed, 2020). Implications for Post-Secondary Education As was mentioned previously in the results and discussion sections, respondents had an overall appreciation for web-based instruction—whether synchronous or asynchronous. This has additional implications for post-secondary education. University departments and state education policymakers who are involved in the Web-based instruction movement should initiate communications and begin working to shape web-based instruction practices. Such communication will assist educational policy leaders in understanding the unique dimensions of web-based instruction and foster professional learning communities. Such learning communities are an excellent medium where state education representatives can come together to create a dialogue with university and other state educational leaders concerned with top-to-bottom articulation of Web-based instructional policy and practitioners. Universities, state education agencies, and the U.S. Department of Education should collaborate on the fostering of a scientific research agenda related to the use of Web-based instruction for professional development and learning with students in a university online environment.

References

- Barrot JS, Llenares II, Del Rosario LS. *Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines*. Educ Inf Technol (Dordr). 2021;26(6):7321-7338. DOI: 10.1007/s10639-021-10589-x. Epub 2021 May 28. PMID: 34075300; PMCID: PMC8162157.
- Boot WR, Charness N, Czaja SJ, Sharit J, Rogers WA, Fisk AD, Mitzner T, Lee CC, Nair S. *Computer proficiency questionnaire: assessing low and high computer proficient seniors*. Gerontologist. 2015 Jun;55(3):404-11. DOI: 10.1093/geront/gnt117. Epub 2013 Oct 9. PMID: 24107443; PMCID: PMC4542703.
- DuFrene, Debbie D.; Clipson, Timothy W.; and Wilson, S. Ann, "An Examination of College Students' Computer Self-Efficacy as Related to Various Demographic Characteristics" (2011). Faculty Publications. 431.
- Mehran Farajollahi Mohamadreza Sarmadi², Bahman Zandi³, Mohsen Keshavarz. *Investigating The Effect of Distance Education System on The Computer Literacy of Ma Students In Tehran University*. The Online Journal of Distance Education and e-Learning, January 2016 Volume 4, Issue 1.
- Habiba, U. and Ahmed, S.M.Z. (2020), "Demographics and perceived computer skill levels as predictors of faculty awareness and use of electronic information resources", Digital Library Perspectives, Vol. 36 No. 3, pp. 281-301. <https://doi.org/10.1108/DLP-04-2020-0019>.
- Elizabeth Armstrong-Mensah, Kim Ramsey-White, Barbara Yankey & Shannon Self-Brown. COVID-19 and Distance Learning: *Effects on Georgia State University School of Public Health Students*. Front. Public Health, 25 September 2020. Sec. Public Health Education and Promotion <https://doi.org/10.3389/fpubh.2020.576227>
- M Paula Cacault, Christian Hildebrand, Jérémy Laurent-Lucchetti, Michele Pellizzari, *Distance Learning in Higher Education: Evidence from a Randomized Experiment*, Journal of the European Economic Association, Volume 19, Issue 4, August 2021, Pages 2322–2372, <https://doi.org/10.1093/jeea/jvaa060>
- Mukhtar K, Javed K, Arooj M, Sethi A. *Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era*. Pak J Med Sci. 2020 May;36(COVID19-S4):S27-S31. DOI: 10.12669/pjms.36.COVID19-S4.2785. PMID: 32582310; PMCID: PMC7306967.
- Alaa Zuhir Al Rawashdeh, Enaam Youssef Mohammed, Asma Rebhi Al Arab, Mahmoud Alara & Butheyna Al-Rawashdeh (2021). *Advantages and Disadvantages of Using e-Learning in University Education: Analyzing Students' Perspectives*. www.ejel.com
- Aithal, P. S., and Aithal, S., 2016. *Impact of online education on the higher education system*. International Journal of Engineering Research and Modern Education (IJERME), 1(1), pp. 225-235.

Arkorful, V., and Abaidoo, N., 2015. *The role of e-learning, advantages, and disadvantages of its adoption in higher education*. *International Journal of Instructional Technology and Distance Learning*, 12(1), pp. 29-42.

Barrot JS, Llenares II, Del Rosario LS. *Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines*. *Educ Inf Technol (Dordr)*. 2021;26(6):7321-7338. doi: 10.1007/s10639-021-10589-x. Epub 2021 May 28. PMID: 34075300; PMCID: PMC8162157.

Gautam, S. S., and Tiwari, M. K., 2016. *Components and benefits of e-learning system*. *International Research Journal of Computer Science (IRJCS)*, 3(1), pp. 14-17.

Radu, F., Radu, V., and Croitoru, G., 2011, February. The advantage of the new technologies in learning. In: 10th international conference on artificial intelligence, knowledge engineering and databases (pp. 150-155)

Axmedova T.B, & Kenjayeva N.D. (2021). *Advantages And Disadvantages of Online Learning*. *Eurasian Journal of Humanities and Social Sciences*, 3, 48–50. Retrieved from <https://geniusjournals.org/index.php/ejhss/article/view/240>

Rizaldi, D. R., & Fatimah, Z. (2020). *How Distance Learning can be a Solution during the Covid-19 Pandemic*. *International Journal of Asian Education*, 1(3), 117–124. <https://doi.org/10.46966/ijae.v1i3.42>

Nikolaos Pandis. *Multiple linear regression analysis*. *STATISTICS AND RESEARCH DESIGN*| VOLUME 149, ISSUE 4, P581, APRIL 01, 2016. DOI:<https://doi.org/10.1016/j.ajodo.2016.01.012>

Razia Isaeva, Eve Eisenschmidt, Katlin Vanari & Kaija Kumpas-Lenk (2020). *Students' views on dialogue: improving student engagement in the quality assurance process* <https://doi.org/10.1080/13538322.2020.1729307>