

## **Enhancing Access and Usability of Information Resources: Mobile vs. Desktop Access and Usability of Information Resources among Users at Kaduna State University**

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### **Abstract**

*This study investigated the comparative access and usability of information resources across mobile and desktop platforms. As mobile device usage for information access continues to grow, understanding the differences in user experience between these platforms is important for effective information dissemination. This empirical research examined user performance, task completion time, and satisfaction when accessing a specific online information resource on both mobile and desktop devices. A qualitative approach has been adopted in gathering data. The study revealed the challenges and advantages associated with each platform. Recommendations have been provided, given an insight into optimizing interface design and information architecture for both mobile and desktop environments, ultimately enhancing the overall usability and effectiveness of information resources for diverse user needs.*

**Keywords:** Information Resources, User Experience

### **Introduction**

In the digital age, access to information resources has become a cornerstone of modern life, shaping how we learn, work, and communicate. Two primary devices (computers and mobile phones) have emerged as the most widely used tools for accessing and utilizing these resources. While both devices serve similar purposes, they differ significantly in terms of accessibility, usability, and functionality. Computers, with their larger screens, robust processing power, and versatile software, have long been the go-to choice for tasks requiring detailed analysis, multitasking, and content creation. On the other hand, mobile phones, with their portability, convenience, and ever-expanding capabilities, have revolutionized how we access information on the go, making them indispensable in our daily lives. This discussion explores the strengths and limitations of computers and mobile phones in accessing and utilizing information resources, highlighting how each device caters to different user needs and contexts. By examining their respective roles, we can better understand these

technologies complement each other in the evolving landscape of information access and usability.

Apart from physical hardcopies of information resources stored in libraries, computers as well as mobile phones are the commonly means of accessing and using information resources. According to Aladeniyi & Owokole (2018) Information sources in electronic forms and other media, are the most widely used in university libraries Textbooks, journals, handbooks, newspapers, periodicals, dictionaries, encyclopedias, the internet, computers, abstracts, and audio-visual materials are all examples of these. Libraries' main core aim and objective has been to choose, gather, organize, and make information more accessible and usable. The library's aim may not have been met until these resources reach their maximum capacity of access and usage by clients (Onye, 2016). The proliferation of access and use of computers and mobile devices had introduced a wide range of computer-based and mobile-based instructional methods including computer-based and mobile-based testing and assessment through platforms like telegram, WhatsApp, Facebook, and others.

Computer-based testing and assessment offer several advantages to both instructors and students. In the first place, instructors can take advantage of real-time feedback, automated score processing and analysis, improved security, cost and time reduction (Terzis and Economides, 2011). Whereas, students experience a positive impact on their learning attitudes, motivation and performance (Authors, 2016). Moreover, mobile-based testing and assessment can be implemented anytime and anywhere, eliminate the need for specialized computer labs, facilitate formative, self- and peer- assessment and offer extended capabilities such as personalization, context-awareness and ubiquity (Authors, 2017). Mobile devices can be used alternatively to desktop computers in testing and assessment, minimizing seating time and associative costs in the context of Bring-Your Own Devices (BYOD). Another critical factor for its successful implementation is its adoption by users. According to the Technology Acceptance Model (TAM) (Davis, 1989), an information system can be adopted by users (behavioral intention to use) when the system is considered easy to use (high perceived ease of use) and useful (high perceived usefulness). This concerns of mobile-based testing and assessment in education is developing rather slowly due to barriers such as technical infrastructure, content and curriculum, professional development, organization and leadership (Lucas, 2018; Deutsch et al., 2012). Usability is “the extent to which a system, product or service can be used by specified users to achieve specified goals with

effectiveness, efficiency and satisfaction in a specified context of use” (ISO 9241-11:2018, 2018). User experience is “a person’s perceptions and responses that result from the use of a product, system, or service” (ISO 9241-210:2010, 2010).

## **Literature Review**

The usability of information resources across mobile and desktop platforms has been a critical area of research, driven by the distinct technical, contextual, and user-centric challenges each platform presents. Mobile usability is inherently tied to dynamic, on-the-go contexts, where users interact with devices while navigating distractions, variable connectivity, and physical mobility. In contrast, desktop environments are typically static, allowing users to focus on complex tasks without environmental interruptions. For example, mobile users often prioritize short, simple interactions due to divided attention, whereas desktop users engage in prolonged, multi-step workflows. Studies also emphasize that mobile contexts amplify challenges like screen glare, posture adjustments, and interruptions, which are less prevalent in desktop setting.

Mobile devices face limitations in screen real estate, necessitating simplified layouts, prioritized content, and adaptive designs to avoid cognitive overload. Desktop interfaces, with larger screens, can accommodate dense information and multi-window workflows. While in the mobile devices, input errors (example, accidental clicks) are more frequent, demanding robust error-handling mechanisms. In term of satisfaction, mobile users value speed and simplicity, while desktop users prioritize feature richness and customization. Mobile applications must account for intermittent connectivity and limited processing power, which can degrade performance like, slow load times and disrupt user workflows. Desktop systems, with stable internet and higher computational resources, support data-heavy applications more effectively, like video editing.

From the other side, usability evaluation of mobile learning applications is an active area of research (Kumar and Mohite, 2018) and it is strongly associated with educational effectiveness and institutional adoption (Vavoula and Sharples, 2009). However, most studies focus on hardware and operating systems characteristics or single specialized apps (Coursaris and Kim, 2011). Moreover, there is still little comparative research focusing on computer and mobile based assessment usability and user experience metrics, with more studies to provide mostly qualitative results.

In another study, students were highly motivated and enjoyed using a mobile application for testing compared to web-based assessment systems (Romero, Ventura and DeBra, 2008). However, studies have reported numerous limitations when designing content for mobile devices (e.g. screen size, scrolling, typing or entering inputs) compared with desktop computers (Guler, Kilic, and Cavus, 2014). These limitations have an impact on system usability and mobile user experience. For example, studies have reported a significant effect of screen size on usability metrics (effectiveness and efficiency) and perceived usability (Raptis, Tselios, Kjeldskov, and Skov, 2013). Also, users of desktop computer exhibited different web search behavior (search strategies, information seeking, saving results tasks, viewing and clicking) compared to mobile users (Ong, Jarvelin, Sanderson and Scholer, 2017). Web searching and reading may be more difficult to mobile devices comparing to desktop computers (Findlater and McGrenere, 2008).

However, other studies suggested that mobile characteristics negatively affect users' satisfaction only when the task complexity increases (Chae and Kim, 2004). For example, e-books for mobile phones were highly welcomed by the learners (Bidaki, Sanati, and Ghannad, 2013). Gaming with smartphones is preferred due to their touchscreen and portability (Adepu and Adler, 2016). Students who used mobile devices in collaborative environments vs. desktops self-reported a more positive effect in their flow experience than the students that used desktops (Abrantes and Gouveia, 2010). Recent studies have shown that applications on smartphones were judged to be more usable than applications on other platforms (Kortum, and Sorber, 2015). The portability and ease of use mobile characteristics highly influence smartphone usage over desktop computers (Adepu and Adler, 2016).

### **Research Questions**

1. Is there any difference in the overall usability between desktop computers and mobile devices in the context of enhancing usability of information resources?
2. Is there any difference in the user experience between desktop computers and mobile-devices in the context of enhancing access to information resources?

### **Objectives of the study**

This paper aims to explore computer and mobile devices on enhancing access and usability of information resources.

1. To examine how computer and mobile devices are enhancing access of information resources.

2. To explore how computer and mobile devices are enhancing usability of information resources.

### **Significance of the study**

Essentially, research in this area makes sure information is available, accessible, and usable by the widest possible audience, leading to better engagement, increased efficiency, and ultimately, greater success.

### **Methodology**

This study adopted a qualitative research method. According to Musa (2013) qualitative research methodology refers to the method of inquiry employed to gather an in depth understanding of phenomenon and human behavior especially feelings, perceptions or opinions, and the reason that governs behaviour. Phenomenological research design is seen to be best suited for this study. Therefore, people's experiences were gathered and analyzed in the research. According to Giorgi, A. (2009) a phenomenological study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, of people's experiences. Qualitative research methodology, according to Denzin and Lincoln (2003), involves an interpretive, naturalistic approach to its subject matter; it attempts to make sense of, or, to interpret, phenomena in terms of the meaning people bring to them. Qualitative research is suitable for this study because it provides deeper understanding of human information behavior in social phenomena (Mohammed, et al 2014). Purposive sampling was adopted for the study. In purposive sampling, few participants are deliberately selected to reflect particular features of community within the population (Mohammed, et al 2014). Population of the study comprised of seven (7) participants for the study and were selected using purposive sampling methods in Kaduna State University. Users were briefed and interviewed about the objectives of the study.

### **Method of data analysis**

With the consent of the participants, interviews were audio taped and the records were transcribed verbatim using phenomenological analysis to explore and describe the lived experiences of individual respondents. According to Mohammed, et al (2014), phenomenological analysis is describing the existential aspects of human existence and the ways in which individuals relate to their world.

Based on the research questions, first respondent explained to have “used computer for higher education studies due to the size of the screen, but prefer to use mobile phone for personal purpose, because of the easy mobility of the mobile devices”. Second respondent said, “I enjoyed using my mobile phone in a lecture hall and library with Wi-Fi support, because of the comfortability of the device’ Third respondent gave his interview version as, “I prefer using computer for its visual, as well as auditory advantages, for effective learning experiences”. Fourth respondent mentioned that, “access to the vast amount of information and information visualization techniques are two experiences that derived my interest in preferring using computer for searching information resources”. Fifth respondent had given account as follows, “I found the use of mobile devices for the assessment more attractive, enjoyable and pleasing”. The sixth respondent said, “It is easy to get familiar to, understand and use mobile phone than computer, because of its complexity”. Seventh respondent narrated that, “I found computer to have great advantage over mobile phone, because different tasks could be performed at the same time”. Above are the interview transcriptions as sourced from the seven (7) respondents who keenly participated in the study.

### **Discussion of the findings**

From the research findings, it was discovered that, (i) used computer for higher education studies due to the size of the screen, but prefer to use mobile phone for personal purpose, because of the easy mobility of the mobile devices. The results agree with previous research on usability ratings between mobile and computer methods (Proaps et al., 2014). The similar scores in overall usability for the desktop computers and mobile devices may suggest an interchangeable use of these devices in certain assessment tasks. (ii) I enjoyed using my mobile phone in a lecture hall and library with Wi-Fi support, because of the comfortability of the device. Comfortability may mean easy to be move around with the device, which mobile phone has an advantage over computer device. This may lead to minimize computer seat time (and the associated costs) since on-line assessments can be implemented in regular lecture rooms with Wi-Fi support, instead of dedicated computer rooms.

This is also in-line with the emerging Bring Your Own Device (BYOD) policies (Johnson et al., 2016). (iii) I prefer using computer for its visual, as well as auditory advantages, for effective learning experiences. Virtual and audio advantages lead to effective learning experiences in the context of access and usability of information resources. Taking also into



consideration the learnability, the most audible device is the mobile phone, where one can move around comfortably and be listening without distraction. The findings agree with previous research that provided evidence for the positive student attitudes towards the use of mobile devices in assessments (Authors, 2018). (iv) access to the vast amount of information and information visualization techniques are two experiences that derived my interest in preferring using computer for searching information resources. As previous research suggests, not all tasks may benefit from larger screen displays (Raptis et. al., 2013). Students felt in control of the interaction and felt confident when working with the computers. (v) I found the use of mobile devices for the assessment more attractive, enjoyable and pleasing. It worth noted that, even no significant differences existed; stimulation was higher for the mobile-based assessment. (vi) It is easy to get familiar to, understand and use mobile phone than computer, because of its complexity.

Therefore, from the usability and user experience perspectives, empirical evidence that mobile devices can possibly replace or complement desktop computers for on-line summative assessments in higher education (Bangor, et. al. 2008). (vii) I found computer to have great advantage over mobile phone, because different tasks could be performed at the same time. There is great difference between mobile and computer devices in term of access and usability of information resources is multi-tasking approach of computer over mobile phone (Brooke, 1996).

## **Conclusion**

The study was conducted investigating which among mobile phone vs computer desktop has advantages over another in enhancing access and usability of information resources. The study revealed that, computer is more used in education setting rather than personal use (used computer for higher education studies due to the size of the screen, but prefer to use mobile phone for personal purpose, because of the easy mobility of the mobile devices). Mobile phone is movable thereby so comfortable anywhere (I enjoyed using my mobile phone in a lecture hall and library with Wi-Fi support, because of the comfortability of the device). Learning experiences derived users' emotion towards a device (I prefer using computer for its visual, as well as auditory advantages, for effective learning experiences). Users preferred computer over mobile phone because of access to vast information resources ('access to the vast amount of information and information visualization techniques are two experiences that derived my interest in preferring using computer for searching information resources). In

making assessment, mobile phone is more preferred over computer (I found the use of mobile devices for the assessment more attractive, enjoyable and pleasing). Understanding and familiarity of use of mobile phone makes it easier than computer (It is easy to get familiar to, understand and use mobile phone than computer, because of its complexity). Different tasks could be performed at once when using computer (I found computer to have great advantage over mobile phone, because different tasks could be performed at the same time).

## **Recommendations**

With the proliferation of computers as well as mobile phones, it is very important to give regard to all that would enhance access and usability of information resources to the users. Therefore, it is recommended that efforts should be geared towards optimizing interface design and information architecture for both mobile and desktop environments, ultimately enhancing the overall usability and effectiveness of information resources for diverse user needs. Computers were judged in this study to be more usable than smartphones. Hence it is recommended that more platforms like WhatsApp, Facebook, skype, Instagram, telegram, linkedin, slack, etc. are to be engaged in accessing and usability of information resources.

## **REFERENCES**

- Abrantes, S., & Gouveia, L. B. (2010). A study on the usage of mobile devices in collaborative environments vs desktops: An approach based on flow experience. *International Conference on e-Business (ICE-B)*, Athens, 1–4.
- Adepu, S., & Adler, R. F. (2016). A comparison of performance and preference on mobile devices vs. desktop computers. *IEEE 7th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON)*, New York, NY, 1–7.
- Aladeniyi, F. R., & Owokole, T. S. (2018). Utilization of library information resources by undergraduate students of University of Medical Science Ondo, Ondo State, Nigeria. *American Contemporary International Research Journal*, 8(4), 92–99. <https://doi.org/10.30845/aijcr.v8n4p9>
- Bangor, A., Kortum, P. T., & Miller, J. T. (2008). An empirical evaluation of the system usability scale. *International Journal of Human-Computer Interaction*, 24(6), 574–594.
- Bidaki, M. Z., Sanati, A. R., & Ghannad, F. R. (2013). Producing and introducing mobile books as a new model of providing learning content in medical sciences. *Procedia – Social and Behavioral Sciences*, 83, 99–102.



- Brooke, J. (1996). SUS: A 'quick and dirty' usability scale. In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland (Eds.), *Usability evaluation in industry* (pp. 189–194). London, UK: Taylor and Francis.
- Chae, M., & Kim, J. (2004). Do size and structure matter to mobile users? An empirical study of the effects of screen size, information structure, and task complexity on user activities with standard web phones. *Behaviour and Information Technology*, 23(3), 165–181.
- Coursaris, C. K., & Kim, D. J. (2011). A meta-analytical review of empirical mobile usability studies. *Journal of Usability Studies*, 6, 117–171.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Economides, A. A., & Grousopoulou, A. (2010). Mobiles in education: Students' usage, preferences and desires. *International Journal of Mobile Learning and Organisation*, 4(3), 235–252.
- Denzin, N. K., & Lincoln, Y. S. (2003). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The landscape of qualitative research: Theories and issues* (pp. 1–45). Thousand Oaks: Sage Publications.
- Findlater, L., & McGrenere, J. (2008). Impact of screen size on performance, awareness, and user satisfaction with adaptive graphical user interfaces. In *Proceedings of CHI 2008* (pp. 1247–1256). ACM Press.
- Giorgi, A. (2009). *The descriptive phenomenological method in psychology: A modified Husserlian approach*. Duquesne University Press.
- Guler, C., Kilic, E., & Cavus, H. (2014). A comparison of difficulties in instructional design processes: Mobile vs. desktop. *Computers in Human Behavior*, 39, 128–135.
- ISO. (2018). Ergonomics of human-system interaction, Part 11: Usability: Definitions and concepts (ISO 9241-11:2018). <https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-2:v1:en>
- ISO. (2010). Ergonomics of human-system interaction, Part 210: Human-centred design for interactive systems (ISO 9241-210:2010). <https://www.iso.org/obp/ui/#iso:std:iso:9241:-210:ed-1:v1:en>
- Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC horizon report: 2016 higher education edition*. The New Media Consortium.
- Kortum, P., & Sorber, M. (2015). Measuring the usability of mobile applications for phones and tablets. *International Journal of Human-Computer Interaction*, 31(8), 518–529.
- Kumar, B. A., & Mohite, P. (2018). Usability of mobile learning applications: A systematic literature review. *Journal of Computer Education*, 5(1), 1–17.
- Lucas, M. (2018). External barriers affecting the successful implementation of mobile educational interventions. *Computers in Human Behavior*, 1–7.

- Mohammed, B., & Abule, M. (2014). An examination of health information service provision at Federal Medical Center, Katsina. *Qualitative and Quantitative Methods*, 2, 503–508.
- Musa, I. A. (2013). *Resistance to polio immunization in Kano State, Nigeria*.
- Ong, K., Jarvelin, K., Sanderson, M., & Scholer, F. (2017). Using information scent to understand mobile and desktop web search behaviour. *Proceedings of SIGIR'17*, Shinjuku, Tokyo, Japan.
- Onye, U. U. (2016). Availability, accessibility and utilization of library information resources by students of the Federal University of Technology, Owerri (FUTO). *Information and Knowledge Management*, 6(10), 20–24.
- Proaps, A. B., Landers, R. N., Reddock, C. M., Cavanaugh, K. J., & Kantrowitz, T. M. (2014). Mobile and computer-based talent assessments: Implications of workload and usability. *Computer-Human Interaction*, ACM.
- Raptis, D., Tselios, N., Kjeldskov, J., & Skov, M. (2013). Does size matter? Investigating the impact of mobile phone screen size on users' perceived usability, effectiveness, and efficiency. In *Proceedings of the 15th international conference on Human computer interaction with mobile devices and services* (pp. 127–136). Munich, Germany.
- Romero, C., Ventura, S., & De Bra, P. (2009). Using mobile and web-based computerized tests to evaluate university students. *Computer Applications in Engineering Education*, 17(4), 435–447.
- Terzis, V., & Economides, A. A. (2011). The acceptance and use of computer-based assessment. *Computers & Education*, 56(4), 1032–1044.
- Vavoula, G., & Sharples, M. (2009). Meeting the challenges in evaluating mobile learning: A 3-level evaluation framework. *International Journal of Mobile and Blended Learning*, 1(2), 54–75.