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To cite this article: Watson Moffat Manduna (2014) Access–usage qualities of information technology in higher education setting, Journal of Psychology in Africa, 24:2, 200-202, DOI: [10.1080/14330237.2014.903073](https://doi.org/10.1080/14330237.2014.903073)

To link to this article: <https://doi.org/10.1080/14330237.2014.903073>



Published online: 11 Sep 2014.



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BRIEF REPORT

Access–usage qualities of information technology in higher education setting

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This study examined access and usage qualities as perceived by students of Information Communication Technologies (ICT) at a South African technology university. Participants were 40 randomly selected first-year ($n = 20$) and second-year ($n = 20$) students with an average age of 23 years. There were 13 female first year students and 12 female second year students. They responded to a brief survey on aspects of ICT availability and utilisation on campus. The data were descriptively analysed. Findings suggest ICT access to be influenced by cost, ownership and usage by individual interest.

Keywords: accessibility, availability, Information Communication Technology, evaluative learning, resources

Information and communication technologies (ICT) have revolutionised instructions in higher education to the extent that they are available, accessible and universally accessible to users. ICT refers to computers and their interfaces, including the information itself, and how it is created, collected, represented, stored, transferred, and used (Ssewanyana, 2007; Riley, 2012).

Accessibility ensures that services and or products (SoPs) are obtainable to and usable by the widest possible audience. Focus is on how access and ownership (Warschauer, 2002) is obtained and how designers, developers and service providers embed assistive devices on the SoPs. Universal access makes sure that SoPs and environments are designed to be usable by all people, to the ‘greatest extent possible, without the need for adaptation or specialized design’ (Mace, 2008). ICT enhanced learning can conveniently be used by students to repeat the topics that they did not understand the first time. Furthermore, computer simulations software can help explain certain concepts which are difficult or impossible to explain verbally or in writing (Murphy & Greenwood, 1998). Videos, television, and multimedia, e-learning, blended-learning, www, social media, Computer Aided Learning (CAL), Computer Assisted Instruction (CAI) applications and adaptive technology are vital ICT tools. They provide students with challenging and authentic content that motivates them in the learning process (Murphy & Greenwood, 1998; Tinio, 2003). Availability of (SoPs) involves the degree to which a system, subsystem, or service is operable and in a committable state at the start, during and end of a mission (Xin, 2007; Fuchs & Horak, 2008).

Availability and accessibility may be different from user groupings (Fuchs & Horak, 2008), and this may create a digital divide which may exclude would be users. In the context of higher education learning and teaching, ICT has an added advantage in facilitating efficiency of learning and teaching (Apkan, 2002; Bork, 2002; Hong & Ridzuan, 2003). For instance, ICT is important for students’ active, evaluative, integrative, creative and collaborative learning skills (Murphy & Greenwood, 1998; Apkan, 2002; Bork,

2002; McNair & Galanoui, 2002; Hong & Ridzuan, 2003; Tinio, 2003). ICT-enhanced learning bridges the artificial separation between different disciplines and between theory and practice that characterises the traditional classroom approach (Richards, 2005).

Through tele-collaborative projects, students are able to distribute and share information through tele- and web-based collaboration tools such as e-mail, listservs, discussion groups or forums, message boards, real-time chat, wikis, and software such as Module and Blackboard (Tinio, 2003; Carnoy, 2005). With ICT access and usage, students are both consumers of and producers of information (De Corte, 2002). They are empowered to explore and discover (Haddad & Drexler, 2002). However access and usage issues remain understudied although they would be important for initiatives to roll out ICT where it presents strategic education provision advantage.

Usage is about gaining admittance to physical artifacts, content, skills, and social support. (Warschauer, 2002). ICTs access is based on ownership of or availability of a device/service (Warschauer, 2002). It breaks down the isolation of individuals (Gillwald & Stork, 2010) as it enables them to engage with others and contribute positively to their personal and community development. Like usage, it is limited by income, literacy, education, gender (Gillwald & Stork, 2010) and other socio-economic variables. Availability data was gathered from their perceptions on ICTs’ reliability, maintainability, serviceability, and security measures. Access -usage is about how information itself, and how it is created, collected, represented, stored, transferred, and used.

This study examined ICT access and usage qualities as perceived by undergraduate students attending a technology university. The following question guided the study. (1) What is the ICT access and usage features important to supporting students in their learning in the context of a higher education environment?

Method

Participants and setting

Participants were a sample of 40 under-graduate students (females = 25, average age of 23. They were randomly selected from the class list of 176 beginning (first year: $n = 20$) and continuing (second year: $n = 20$) computer science education students.

Data collection/measures

Students responded to a semi-structured survey on their perceptions on accessibility and availability usage of ICT at the university and within their department. The survey questions on access qualities focused on varied physical and socio-economic factors. Examples of the questions on access included: do have your own ICT tool (computer) and how frequent do you use a computer at these places: at university? Home? Other places? Those on usage qualities focused on ICTs' reliability, maintainability, serviceability and security measures. Examples of such questions include: the computers in our computer laboratory have all the necessary software, yes or no? Our laboratory is equipped with fast computers with good bandwidth, yes or no?

Procedures

Permission for the study was granted by the Head of the Computer Science Department. The participants individually consented in writing. Data were collected during normal class time.

Data analysis

The numeric data were descriptively analysed using graphpad. The qualitative data were thematically analysed and reported on to supplement the quantitative data.

Results

Accessibility based findings

The research findings suggest ICT access by students to be constrained by simple lack of availability and/or administrative restrictions. For instance, access to basic ICT such as printers was reported at a mere four percent; photocopying at one percent, and the intranet at five percent. Students reported lack of usage of video-conferencing.

About 78% of the students indicated that there is constricted access to the computer laboratory. A participant observed that the laboratory was constantly occupied by others (#40). Similarly 73% of the students reported access overload for the library computer facility. An overwhelming 91% of the students reported access restrictions from computer laboratory lunch time and after hours closures by staff.

Usage

Figure 1 summarises key usage influences as perceived by the students.

Students reported the absence of certain computer software that they felt could enhance their learning capabilities. For example, 87% argued that there was no multimedia software, which according to participant number 50, a second year student, could have been effectively used for micro teaching to receive proper feedback and analyse the strengths and weaknesses of their delivered lessons. About 89.3% of the students indicated that they did not use images, graphics, videos, charts and graphs to present, demonstrate, drill, practice, interact and collaborate with colleagues. About 98.8% of the respondents noted that there is inadequate bandwidth. A participant remarked that it was 'difficult to access useful academic video files, or download and/or upload large files' (#17). Access to application software such as word processors, spreadsheets and presentation software was limited with 65% students not using the word processor, spread sheet and presentation applications. Few of the students reported being able to independently create multimedia applications (15%) and web pages (13.8%).

Discussion

The lack of access to and the unavailability of ICTs reported imply that ICT is being under-utilised by students at this university. The fact that the students never or rarely use word processors, desktop publishers, spreadsheets and databases limits their integrative learning competence (see also Richmond, 2012; Tinio, 2003). For example, respondent 21, a second year student felt that multimedia kits or a simple webcam with a television set and DVD player could have been vital for their micro-teaching lessons.

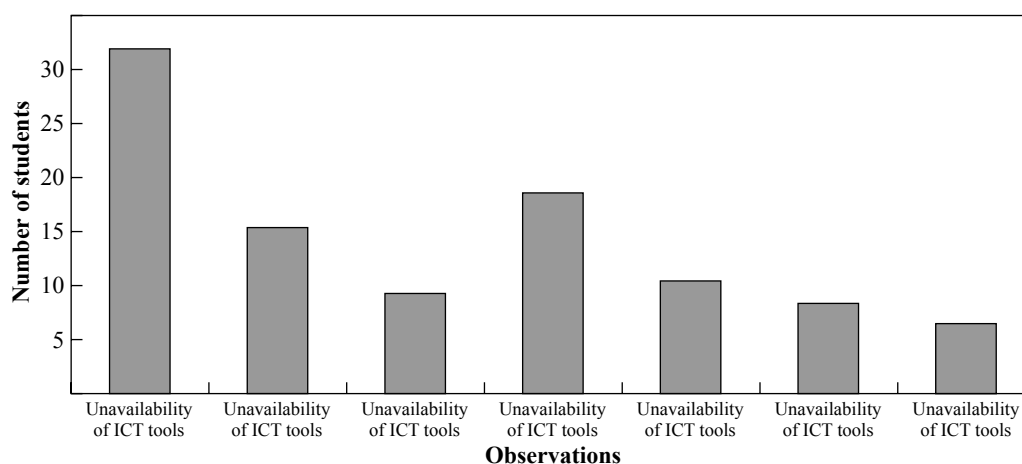


Figure 1. Students perceived observations on the availability of ICTs.

Computers alone cannot be sufficient in harnessing the potential of ICT in learning (Samad, 1997), as it also depends on the integration of the technology with activities. We therefore advocate that the effectiveness of ICT usage mainly depends on the willingness of mentors, lecturers, teachers and students to engage with computers and how ICT is integrated in meaningful learning activities (Demetriadis, 2003). As noted by the results, a continued reliance on the traditional teaching/learning methods by the lecturers and students respectively means less or no integrative learning.

Limited access-usage by the students may also be from their lack in training in ICT. Kessy, Kaemba, & Gachoka (2006) noted that some people might have computer infrastructure in place to support the use of ICT in education, but may not use it because of ignorance on how it can be used in the learning environment. The present investigation suggests that the unavailability of these ICT tools might cripple the students' potential in evaluative learning.

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