Web-Based Learning As An Important Bridge In Information Divide In Contemporary Practice Of Pathology In The Developing World: Findings From Nigeria

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Citation
I Bassey, I Ekanem, B Olasode, G Jombo. Web-Based Learning As An Important Bridge In Information Divide In Contemporary Practice Of Pathology In The Developing World: Findings From Nigeria. The Internet Journal of Third World Medicine. 2008 Volume 8 Number 2.

Abstract

Aim To assess the degree of adoption of web-based and modern information and communication technology (ICT) facilities in the practice of Pathologists in Nigeria.

Methods Structured questionnaires were either posted or e-mailed to Pathologists in Nigeria. Information such as computer literacy/ownership, internet accessibility and frequency, and a self assessment of web-based learning were obtained. Data obtained was analysed using simple descriptive methods.

Results About 83.7% of the respondents used internet for literature reviews, 67.6% for tutorials and 19% for chats. Also 40.5% of the respondents assessed their computer skills to be good, similar to those who considered their skills to be fair while 13.5% considered their skills to be excellent. Those who had computers at both office and home were 67.6%, home alone 18.9%, office alone 5.4% while 8.1% had no computer anywhere. Those who accessed internet services at home were 27%, similar to those who used cyber café; 37.8% used office while 8.1% had internet services both at home and office. Some of the barriers to unhindered access to internet services as obtained from the respondents include: lack of technological know how, too much monthly subscription cost, software/hardware incompatibility, poor/irregular network signals and high bandwidth among others.

Conclusion Pathologists in the developing world need to confront head on the myriad of challenges associated with adoption of modern ICT in the course of their practice. This would properly position them to continue making meaningful contributions to modern day Medicine.

INTRODUCTION

The advent of modern information and communication technology (ICT) has no doubt transformed the entire practice of Medicine in the new millennium. Though apparently a new innovation with its usual challenges, its benefits to humanity already far outweigh whatever technical hitches presently associated with the application of this information super highway in various disciplines of medical practice.

In Hongzhou China for example, it was observed that, it was possible to build on demand e-Science system for Traditional Chinese Medicine (TCM) based on existing semantic and knowledge-based techniques. Also in California USA, a computer integrated pharmacy profile was found to provide an up to date list of medications at each visit, thus helping clinicians to avoid duplications and prescriptions that would cause potential drug interactions. Similarly in Stockholm Sweden, web-based simulation of patients (Web-sp) was initiated in order to facilitate the use of realistic and interactive virtual patients in Medicine and Healthcare education. On implementation, the programme was found to be very useful in the training of students in Medicine, Dentistry and Pharmacy in several Universities in that country.

The rapidly increasing rate of scientific advances in the field of pathology, taking place in developed countries is fast widening the already wide gap that exists between them and their developing counterparts. Pathologists in developing countries desperately need to confront these challenges posed by scientific advances in order to offer the best quality of healthcare services both locally and internationally. This would enable them to communicate effectively and efficiently with their colleagues from other parts of the globe in the sharing of ideas, experiences as well as blending of synergistic expertise in the diagnosis of complex clinical ailments.

Because scientific bases of diseases are universal, there is a
well defined common international standard of knowledge and skill required. Since medical knowledge is expanding at a rapid rate, to attain this ‘global standard’ there has to be a correspondingly rapid transfer of knowledge and diagnostic skills. This requires an instructional method which can meet the need for quick and efficient dissemination of new information.

The internet has proved to be one of the most powerful instruments for dissemination of information and democratization of knowledge and offers unprecedented opportunities to confront these challenges. In fact web-based education resources have been predicted to be ‘The Future of Pathology Education’. This paper evaluates the utility and acceptance of web-based pathology learning amongst Nigerian pathologists and tries to identify barriers to optimal utilization of this highly beneficial tool. It focuses on their ‘technological habits’, perceptions and self assessment of effectiveness of web-based learning in improving their skills.

**METHODOLOGY**

Structured questionnaires were e-mailed to different pathologists across Nigeria and telephone calls as well as text message contacts were made to ensure that pathologists who did not visit their mail box regularly, would do so.

Using limited number of answer choices, questions were asked regarding their ‘technological habits’ such as computer literacy/use, ownership of computers, internet access, level of usage and self assessment of effectiveness of web-based learning. There were also free text questions regarding perceptions, barriers/challenges, knowledge of pathology related websites. Demographic data such as location, institution, age group and years of experience were also obtained.

All surveys were anonymous in the sense that at point of collation of responses, identity of the person was not taken into consideration. Data obtained was analysed using simple descriptive methods.

**RESULTS**

Of the 60 questionnaires administered country-wide to pathologists, 37 (62%) responded appropriately. Those who have been practicing Pathology for over ten years were 51% (n=19), 46% (n=17) were below 41 years of age and 8% (n=3) were above 50 years. All the respondents interviewed lived in urban or semi-urban areas of Nigeria and worked primarily in tertiary health institutions.

A review of the various purposes for internet accessibility among pathologists in Nigeria showed that: 83.7% (n=31) of them used it for literature reviews, 67.6% (n=25) used internet for tutorials and 19% (n=7) used it for chats. Those who used for audio and video conferences were 10.8% (n=4) and 8.1% (n=3) for audio and video conferences respectively, (Figure 1).

Information on self assessment on computer skills and literacy by the respondents showed that: those who considered their skills to be excellent were 13.5%(n=5), good and fair were both 40.5% (n=15), while 5.4% (n=2) had no response, (Figure 2).

Concerning the pattern of computer ownership and usage among the respondents, it was found out that: those who have computer both at home and office were 67.6% (n=25), home alone 18.9% (n=7), office alone 5.4% (n=2) while 8.1% (n=3) had no computer, (Figure 3).

A review of the modes of accessibility to internet services among the respondents showed that: 37.8% (n=14) accessed internet at office, 27% (n=10) each at home and public cyber while 8.1% (n=3) had internet services both at home and office, (Figure 4).

Web-based learning was found to have improved the quality of practice of pathology among 92% (n=36) of the respondents particularly in the area of Research, and Clinical skills, 73% (n=27), while 49% (n=18) said their diagnostic skills had improved. The level of improvement was self-rated as moderate among 59% (n=24) of the respondents, 27% (n=10) as major and 3% (n=1) as minimal.

Web-based learning methods were found to be easier among 81% (n=30) of the respondents compared to the traditional methods; 11% (n=4) found web-based learning more tedious, while 3% (n=1) found no difference.

Common complaints/barriers/limitations were those concerning lack of convenient online payment method for what they wanted, lack of technological know-how, too high monthly subscription cost, 15,000 Naira ($100), Software/Hardware incompatibility, Poor/Irregular network signals, high bandwidth requirements, far location of nearest internet café, lack of supporting equipment e.g. a webcam for video conferencing, Epileptic power supply, lack of time, Lack of Internet service provider in the area, slow connectivity and slow download.
Figure 1
Figure 1. Various purposes for internet accessibility among Pathologists in Nigeria.

Figure 2
Figure 2. Analysis of self-assessment on computer skills and literacy by Pathologists in Nigeria.

Figure 3
Figure 3. Pattern of computer ownership and usage among Pathologists in Nigeria.

Figure 4
Figure 4. Modes of accessibility to internet services among Pathologists in Nigeria.

DISCUSSION
Studies shown that, the World Wide Web technology has favorably influenced performance and quality of medical care. Pathology, being an image-based discipline is one of the greatest beneficiaries. As is the case with most learning methods, learner’s perception as well as comfort with the technology influences its use. This is reflected in the claims by 97% of respondents that the internet had improved their practice of pathology. 92% of them had computers (home, office or both). 92% of them used it often with computer skills ranging from fair to good in 80% of cases, and 78% had private access (home or office). When considering ‘access’ it...
is important to note that ‘access’ is beyond accessibility. It includes issues of availability, affordability and continuity. Therefore cost and even convenience cannot be overlooked as majority of frequent internet users accessed it from their offices where payments were subsidized by their institutions, and standby power generators were available. This is so because most pathologists work in tertiary health institutions located in urban/semi urban areas which are better funded than their secondary counterparts. Those without this privilege found it either too costly to embark on or even unavailable and cited an average monthly subscription costs of about 15,000 Naira ($100).

Technological limitations in terms of appropriate technology can be a major limiting factor. Most respondents benefited more from a quantitative increase (acquisition of facts) rather than a more qualitative increase (exchange of ideas and sharing of points of view) in information. Usage of literature reviews and tutorials was more (81%) than audio/video conferencing and chats (19%) because it had less demand on bandwidth and speed of connectivity, more chances of free access and less chances of software/hardware incompatibility. Qualitative learning is more interactive in nature. We need to ask: IS MORE INFORMATION = MORE KNOWLEDGE???

Interaction often utilizes a delivery method that requires delivery of sound, video and graphics – a method often limited by higher and consequently more expensive bandwidth requirements. This limitation is reflected in the number of people (68%) who said they would have loved to participate in audio/video conferencing but could not.

Web-based Learning no doubt presents enormous possibilities; however, in order to derive maximum benefits from it in the developing world, several challenges need to be overcome. These could basically be grouped into three: Learner centered, Technology centered and Political. Interventions should best be directed at these three among others:

The Learner: Most useful Web-based Learning methods are interactive. This requires digital literacy, self directed effort and time (a commodity in short supply- lack of which can be aggravated by poor access). Learner must therefore be an active learner and not one who is passive or resistant to change.

The Technology: Technology limitations such as software/hardware incompatibility, poor connectivity and lack of support personnel as well as online payment options which do not accommodate the peculiar nature of the local banking systems have to be overcome.

The Politics: Healthcare administrators and managers at the level of policy making and financing should mobilize funds towards relevant equipment and infrastructure such as telecommunication, reliable power supply (No access to energy = No access to internet). Privatization of power generating sector could be beneficial and may eliminate inefficient and bureaucratic practices. Policies that enhance affordability (as per telecommunication tariffs and bandwidth charges) would help, because the wrong policies can easily make the best of technology fail to produce the intended results.

In conclusion therefore, Pathologists practicing in the developing world need to make conscientious efforts to confront these challenges head on so as to integrate the new technology into their practice in order to enhance efficiency as well as uplift the quality of their practice. This would no doubt bring the practice of Pathology from this part of the world into the centre of the global wind of technological advancement and ensure a uniform global acceptance of this all important scientific breakthrough for the overall benefit of the world health.

ACKNOWLEDGMENTS

We wish to thank all the Pathologists that willingly participated in this study. Our gratitude goes specifically to: Dr Dupe Samaila, Dr Clement Okolo and Dr Anunobi for assisting with the administration of the questionnaires. Special thanks to Dr Patrick Aleka for his input on our study design.

References


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