ICT in Medical education

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Information & computer technology (ICT) is one field that has seen advancements in leaps and bounds unlike any other thus rendering the practical uses and implementations of information technology (IT) innumerable. Therefore it comes as no surprise that it stands to play a vital role in education, and when concerning the field of medicine, medical education. The availability and accessibility of information in this day and age has been made so simple due to the advent of IT that sometimes when one dives in, drowning in the expanse is a possibility unless one knows where and how to look and how to utilize the available resources appropriately. Hopefully this article will give you some insight as to how to navigate and utilize IT.

The cornerstone of learning has always been textbooks; they play an integral role and since the advent of printing they have revolutionized the way information is stored and spread. As medical students all of us are familiar with the infamous "Book List", a pre-requisite in the process of medical education. What most of us fail to realize is that even publishers, authors and scholars have understood the importance of easy accessibility of information rather than having to carry around cumbersome books that when combined might weigh a considerable amount. The inner-front cover of new editions by most reputed publishers always carry a web address together with an alpha-numeric key code which after a simple process of registration grants the owner availability of the same material over the internet. An easily browsable format, searchable by keyword within the whole book is thus made available to the reader and some may grant the possibility of making personal notes and annotations. The authors of this article respects copyright law and intellectual property and in no instance promote or condone piracy, but it is a known fact that the same is also available in offline format. These materials may be accessed and opened by a variety of applications depending on the file formats in which they are found.

For the eager learner the internet broadens the horizons; degrees once attained only at Colleges/Universities now can be easily acquired from the comfort of your own home via online degree programmes. The Postgraduate Institute of Medicine, Colombo (PGIM) is one institute of many that provides such facilities. The internet also offers access to an abundance of data, so much so that the accuracy and validity of it is of great concern. Thus when searching for data online one has to ensure the sources he or she refers comes from sites which ensure quality, standards and scientific validity. The number of such sites far exceeds the scope of this article; however certain websites are worthy of mention. Eg. www.emedicine.medscape.com, www.gpnotebook co.uk, which are accessible free-of-charge and www.uptodate.com which requires paid registration. These sites offer comprehensive information which can be easily navigated, classified according to sub-specialties and are periodically updated and maintained. The wealth of information available is meant to target the full spectrum from students to specialists. It must be mentioned that certain sites (their number far exceeds that of well recognized sites) even though mostly accurate, cannot be used as a source of reference (eg: Wikipedia) because in the world of science validity is one thing that can never be compromised. One should remember the saying by George Bernard Shaw, "Beware of false knowledge; it is more dangerous than ignorance".

The importance of research is undisputed, and nowadays more or less everyone is involved in it, and if you aren't you may be soon. To carry out research having prior knowledge on what has been done on the selected topic is a prerequisite and this is known as a literature survey. Searching for articles and abstracts has now been made a simple

task. The utilization of Google search engine in scholar mode or Pubmed (www.ncbi.nlm.nih.gov/pubmed) fulfils most needs. But at times abstracts alone are inadequate and full articles may be required and only a handful of sites provide articles for free while most require pay-per-view schemes or monthly/annual subscription, which students from the developing world would find unaffordable. To circumvent this the World Health Organization (WHO) implemented the HINARI programme. This initiative enables countries like ours to gain access to the vast and ever growing collections of health and biomedical literature. Most of the universities have been provided access to the site. The Faculty of Medicine, Colombo & PGIM have also been granted access by this scheme. Thus this site and its abundance of data are accessible from the computer portals available at the libraries at these institutions. But for the enthusiastic researcher who finds even HINARI inadequate he or she may always visit the WHO country office library, where greater access is made available. Other software such Endnote©, Refworks© or Zotero© (A free, easy to use web-browser plug-in) also help simplify research by helping to search for articles via keywords, store databases of selected articles, automatically rearrange references and index and cite articles in documents created by Microsoft-Word© application. These citation methods utilize various standard formats, thus rendering the process of adding and altering references a much simpler task. Applications like SPSS© and STATA© (Data analytical packages) simplify life further by reducing the most complicated statistical analytical tasks to a simple mouse click. However all of these facilities come at a considerable price.

With advancing technology leading to innovations as powerful as desktop computers occupying no more than the palm of your hand, a vast database of knowledge can also be shifted to occupy the same space. For a price there are software specifically designed for these devices, containing information written and edited by renowned professionals in the given field of expertise and updated annually. Eg: UptoDate©, Skyscape©, Lexi-Comp© are to mention a few. These applications allow easy access and navigation with intuitive yet simple layouts with the latest available information, supported research references and summaries of the same. Some may even provide automatic updates resulting in databases that have information that is medically up-to-date. This avenue may not be for everyone as the initial cost of both software and hardware may amount to a considerable sum but there is something for everyone as these applications are classified according to the level of user. Regardless of whether you are a student, internist, a postgraduate or a consultant, if you are a person who wishes to continually update his/her medical education, these will be of immense use.

ICT plays a large role in medical education; both in undergraduate and postgraduate training programs, as well as in continuous medical education for practicing doctors. Many universities have established learning management systems, creating virtual learning environments for teaching medicine. This is known as electronic learning or e-learning. E-Learning is best delivered through a Virtual Learning Environment (VLE). A VLE is a computer-based software system designed to support teaching and learning in an educational setting, i.e. a school or a university. A VLE provides a wide collection of tools such as those for interactive learning, assessment, communication, uploading of content, return of students' work, peer assessment, administration of student groups, collecting and organizing student grades, questionnaires, tracking tools, etc. Originally created for distance education, VLEs are now used most often to supplement face-to-face teaching. VLEs allow instructors/teachers and learners/students to interact in an online community, without being present in the same physical location or time frame. The core of a VLE is a Learning Management System (LMS), which is a collective term used to describe a set of well configured, regularly monitored and centrally managed software tools designed to handle user learning interventions. In Sri Lanka, such VLEs have already been established. The Faculty of Medicine, University of Colombo has a Virtual Learning Environment for teaching and learning medicine, with online lectures and a large resource of educational material. Similar systems are available in other universities.

Practicing clinicians also use ICT in their continuous medical education, and also in accessing the latest information regarding patient care. The internet provides a huge database of medical information, and with the increasing availability of internet access, the modern day clinician is always in touch with the wealth of medical knowledge available.

Clinicians frequently search the internet to find out about the best possible care available for their patients. Many clinicians, even in Sri Lanka, use palm-top devices and smart-phones to search the internet for information while engaging in their practice. Access to medical information was never so easy.

The naysayers may argue that all of these have restrictions such as high initial costs due to hardware and software pre-requirements, constant internet connectivity, and necessity of technical knowhow, but the use of ICT in education is here to stay and will evolve further. Thus it is our prerogative to utilize it to the fullest. All knowledge comes at a price, and an investment in the betterment of one's own education is time and money well spent.