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**ACCESSING ELECTRONIC DATABASES FOR CURRICULUM
DELIVERY IN SCHOOLS: IMPLICATION FOR SCHOOL LIBRARY
MEDIA SPECIALISTS**

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Abstract

This paper discussed the role of electronic databases in education with emphasis on the means of accessing the electronic databases. The paper further highlighted the various types and categories of electronic databases which the schools can explore in the process of teaching and learning as well as the techniques of searching. The implication of electronic databases on the role of the School Library Media Centres and School Media Specialists was also discussed. A list of electronic databases that schools can explore for effective teaching and learning were also presented.

Introduction

Education is at the core of the knowledge economy and learning society. Correspondingly, the role of Information and Communication Technology (ICT) in schools is shifting dramatically from that of being a minor curricula subject, sometimes called informatics, computer literacy or keyboarding (Larson, 2000). Alternatively, it has been used as instructional aid to help student learn other subjects, such as math or science. However, in some countries, ICT is now at the centre of education reform efforts that involve its use in coordination with changes in curriculum, teacher training, pedagogy and assessment. Throughout the

world, many countries have introduced ICT into schools via different courses of action just as their use is underlined by the necessity for improving quality in teaching and learning (Gulbahar and Guvan, 2008). A major advancement that the advent of Information and Communication Technologies (ICTs) has brought to the education sector is the development of electronic databases to support teaching, learning and research.

Also, schools in developed countries are making huge investments in electronic resources and facilities in the hope of attaining the goal of improving the quality of education through enriching the learning environment with the help of educational software and technologies, including electronic databases. Access to electronic resources is only the most obvious problem. According to Kozma, Pelagrum, Owtson, Vogtz and MgGhee (2000) developing countries are faced with the challenges of using ICT to improve and reform education as well as challenges relating to teacher preparation, curriculum, pedagogy, and assessment.

The increasing demands made by users for access to electronic resources, continuous migration from print to online resources and the overall proliferation of electronic content have forced libraries and other information centers to re-examine their traditional operations and workflows. Efficient electronic resources management remains crucial in helping school libraries to fulfill their roles of meeting the information needs of their users. The use of electronic resources enables teachers and pupils to effectively and efficiently access digital information to assist with investigating issues, solving problems, making decision, produce creative solutions to support learning, develop new understanding in areas of learning and teaching. It also helps in developing new thinking and learning skills to support learning (UNESCO/IFIP, 2000). With the use of electronic resources teachers have access to up-to-date information on subjects while students are better able prepared to achieve curriculum outcomes.

According to Watson (2007) electronic databases could facilitate qualitative teaching and learning in classrooms. He further emphasized that databases provide access to teaching and learning resources, in diverse forms, for the use of both teachers and pupils. Adeoye (2003) defined electronic databases as consisting mainly of materials and services in electronic format transmitted over networks. As information is increasingly

recorded in digital format and electronic databases are continually becoming more complex, information storage and retrieval processes have profoundly changed.

Over the past two decades three major migrations have occurred in library services, from printed resources to online electronic databases; from online databases to bibliographic and full-text CD-ROM databases; and from CD-ROM databases to online Internet access to bibliographic and full-text/full-image databases. Various studies have been conducted on the impact of electronic databases on library printed resources as well as CD-ROM technology on online databases.

Moreover, a variety of electronic resources exist today for use in schools. These resources are generally in the form of online services/databases and/or CD-ROM. Teachers and Instructors use these electronic resources to satisfy their teaching, learning and research needs in a manner that allows access to enormous information. The use of online databases has a place and a value in the school curriculum, as a source of current information for students and teachers (Morris, 2004). Through ICTs, a user is able to access information, both bibliographic and full text, in several million documents over a long distance. A user can access the information required once there is a match between a search term and the document descriptors used for describing the documents needed.

The main purpose of establishing online access to electronic databases is to expand both teachers' and students' perception of their information world and to create a means to locate useful documents beyond those collected at building level within the library (Tella and Adu, 2009). Electronic databases should be considered an important extension of offline print, media and electronic resources such as CD-ROM.

The Concept of Electronic Databases

Various authors have presented their opinion on the concept of electronic databases. Watson (2007) defined electronic database an organized collection of information that is made up of related records. Ansari (2003) sees an electronic database as an organized list of published information sources either giving directions (a citation) to where you can find the full information i.e Bibliographic database or containing the

information itself i.e. full text database. Databases do not function the same way but the same skill and knowledge are required to use most databases just as they are often arranged in such a way as to make it easy to obtain specific pieces of information (Mutula and Ojedokun, 2008). While most databases are in electronic format some exist in hard copy form and some are in both. A phone book is an example of a hard copy database though it can also exist in an electronic format.

According to Lafferiere (2002) the collection of electronic databases are regularly updated and organized such that a computer can quickly access requested data. Thus, electronic databases can be seen as a large, regularly updated files of digitised information related to a specific subject or field consisting of records of uniform format, organized for ease and speed of search and retrieval and managed with the aid of a Database Management System/Software. It usually consists of collection of data arranged in a systematic way to make the search easy and fast. In other words, it is a computer-based collection or listing of information, usually organized with searchable elements of fields. Just like a traditional file cabinet, an electronic database is organized by fields, records and fields. You should be familiar with these fields, records or information for effective search and retrieval of information. Electronic databases most often offer users the possibilities of searching many information sources at the same time. Some databases offer full text while some offer bibliographic information.

Electronic databases are available in a number of ways, on the Web, on CD-ROM or on a Library network However, of recent, most electronic databases are web-based and can be accessed only through the Internet, unlike before when they are majorly on CD-ROM format. Thus, the Internet facilities have expanded access to various electronic databases while with the use of CD format; one is limited to the information on the CD-ROM.

It should be noted that electronic databases are different from Internet search engines. The Internet search engines search the World Wide Web, whereas electronic databases search print and electronic sources that are not necessarily available on the World Wide Web but available through institutions or organizations portal or network. Most times, Institutions/

libraries pay subscription to have access to these databases. However, this is not to say that there are no free access electronic databases.

Electronic Databases and Curriculum Delivery

There is evidence from research that electronic databases can help pupils to learn and teachers to teach more effectively. Jamalipour (2000) emphasized that there is not a simple message in such evidence that electronic databases would only make a difference simply by being used. He emphasized that even the fixture of even one computer in the classroom can have a profound effect on the way students learn and the way the classroom operates. Teachers integrating computer use into the curriculum soon modify their classrooms to reflect the changes in student learning behavior that inevitably emerge. Creating space in the classroom for computers and peripherals such as a printer, network connection and large monitor initiates a rethinking process by the teacher, leading to re-evaluating how classroom activities and learning experiences work best. The anytime, anywhere access to information sources, and “ubiquitous” computing enables students to engage directly with expert sources when they are needed; and the *sight, sound, touch* experience becomes a powerful motivator in learning. Convergent technologies now allow experts, peers and collaborators to join the student’s world, enriching learning experiences.”

What is the ideal Classroom?

According to Cradler and Bridforth (2002) an ideal classroom needs Internet access for teaching and learning, distributed multimedia curriculum, on line access to digital libraries, distance education courses and remote collaborative tools. Information on demand for students also includes video, live video broadcast, desktop and videoconferencing. “The use of voice (for activities such as interviews, speeches, background music, explanations) and Video (for live conferences within and between schools) will change the way schools operate”. Watson (2007) corroborated Cardler and Bridforth (2002) by emphasizing that in terms of configuration, today’s classrooms need changed design involving creating two main areas for student use: grouped and networked computer facilities, and an area designated for group-working space.

Lafferiére (2002) emphasized the characteristics of an ideal future classroom to include:

- i. access to on-line resources which use a powerful combination of video, multimedia, text and graphics. These are prepared by specialists in a centralized resource development facility and delivered to individuals or groups by technology.
- ii. provision for the teacher to teach the whole class or part of the class, assisted by technology as appropriate
- iii. provision for all students to learn the same way or to choose ways which suit their own individual learning styles, assisted by technology as appropriate.
- iv. access to individualized curriculum pathways, managed by technology
- v. Access to individualized diagnostic testing and assessment of progress, managed by technology
- vi. Students moving independently between learning areas as necessary, managed by technology
- vii. Flexible room layout and furnishing, large-screen video display
- viii. Individualized access to network resources – wireless networking; cheap, light-weight notebook computers; continuity of access to network resources away from school

Access to Information in Schools

There are a number of reasons for the use of electronic databases in schools. First and foremost there is the need to respond to a mass of information. To some extent there is a social role in putting learners in touch with other people and their ideas. According to Cradler and Bradforth (2002) the efficiency of bringing information to students and teachers provides an economic rationale. Thus, use of electronic database does not only involve gaining access to information but also involves using computer to process and interpret the information, to make meaning and present information.

Types of Databases

Databases differ in subject matter, in forms of materials included (format), the availability of full text (content) and in the method of accessing (Access method). Some databases can be accessed in more than one way.

CD-ROM databases: They are the early form of databases. This type of database is often only available as stand-alone computers. You have to go to the library computer system there.

Networked database: Networked databases are usually available over Library network. This allows one or more person to search at the same time because the library loads all the information on a Central server. These can be accessed from any library site but require a password to use.

Online databases: They are stored elsewhere in remote servers and the library arranged access to them. Some can be searched over the Internet (using password) others require a dedicated Personal Computer.

Accessing Electronic Databases

Databases can be accessed generally on the World Wide Web, over the Library network, and from Stand alone terminals. Access to electronic databases may be free or through subscription. There is a wide range of electronic databases on the Internet. However, most electronic databases are usually proprietary, hence requires permission to access. Such access is granted usually after payment of subscription.

Free access databases are available on the online for free. Some of the free databases are resources that are in the public domain usually supported by government agencies, museums, grants or other funding sources. Also, companies provide free databases to draw users into a website that also contain paid services. Satisfaction derived from the available free resources can draw users into purchasing. For example some organisations provide abstracts of books or articles free and request users to pay for the full-text if they so wish to have access to the full text. However, Adeoye (2003) reiterated the need to continue to have free access databases to meet the needs of schools that are being faced with the problem of funding.

Techniques of searching Electronic Databases

Searching electronic databases can be done through:

1. **Keyword searching:** This involves typing in a word or two into the search box. It is a free text searching. The success of your search depends on the keywords you use. If you use a very common word, you will retrieve many records. The more keywords you use the fewer records you will retrieve.

Example: If you use “Biology” as your keyword, you will retrieve many records. If you use “Molecular Biology” as your keywords, you will retrieve only few materials on “Molecular Biology”. The search term comprises 2 keywords “Molecular” and “Biology”.

2. **Subject searching:** You can also search through the “subject” by typing in the subject into the search box. It should be noted that there are different subject headings for different databases. Example: Learning Ability Vs Intelligence.

Sometimes a topic may not be popular enough to be given its own subject heading.

3. **Use of Boolean operators such as AND, OR, NOT.** With Boolean operators you can combine multiple terms into one search to get more records or hits. You can do this by using the Boolean operator “OR”. Most databases offer Boolean searching

Example:

- a. If you type in Mammals OR Animals, the search engine will find all the records that have either of these words or both word in them, hence you get a lot of records or hits.
- b. If you type in Mammals AND Animals, the search engine will find only the records that have both words in them, you have few records, but which are more specific to your search. The AND operator is used to reduce the number of records or hits you get.
- c. You can also combine your search terms to try and limit the amount of materials or hits you get or eliminate irrelevant terms with the use of Boolean operator NOT. The NOT operator is used to reduce the number of hits you get e.g. Music NOT Jazz will give records that have the world music but do not have the word Jazz

in them. However, you need to use this with care so that you will not eliminate useful records.

- 4. Phrase searching:** Phrase searching involves typing in a phrase in the search box. This is called proximity searching. Phrase searching allows you to combine words so that you only get records where the words are next to each other in specified order. However not all databases do this.

Example:

If you are looking for records on “Molecular Biology”, you will get more precise results by using the phrase “Molecular Biology” than using Molecular AND Biology. You can also revise your search terms, and add or subtract from them as necessary.

Also, in accessing electronic database, note the following:

The database you are using will affect the effectiveness of your search strategy e.g using an Education database such as ERIC to search for materials on “teaching and learning” will be more productive than searching for same in a Health education database such as “HINNARI”.

You may find your search term too broad, hence be more specific e.g use “Molecular Biology” to search for materials on molecular biology instead of “Biology”

Also some search term might be too specific and will return too few hits e.g. use “Rock music” instead of “Grunge”.

5. Keyword Vs Subject searching

The following activities take place in keyword searching:

- (a) Keyword searches different parts of the record including title and abstract while subject searches only subject heading descriptor field.
- (b) Keyword searches for any word or phrase while subject searches from existing list of subject headings
- (c) Keyword searches may retrieve irrelevant records while subject searches has high degree of relevancy
- (d) Keyword searches is good for obscure topics while subject searches is good for common topics

Therefore, for effective search and accessing of electronic databases, you need to develop an effective search strategy. Effective search strategy involves the following basic steps:

- i. developing a context map for your topic: identify your topic/subject focus e.g. Reproduction in Plants. Identify the key concepts in your question and list them. Identify if there are other ways in which you can express these key concepts.
- ii. Follow common search strategies
- iii. Choose appropriate databases
- iv. Use keywords to create search statements
- v. Use synonyms and different word endings. Think about alternative terms that can be used to describe the same concepts. You should think about synonyms, plural/singular form e.g. Information communication technologies/Information communication technology, spelling variations e.g. favour/favor, acronyms e.g. ICT for Information communication technologies etc. Note that many books, journals, web pages and databases are produced in the U.S, thus consider their spellings in your search term.
- vi. Limit your search results. As with any search, the more you know about your final objective, the better chance you will have of reaching it.

Moreover, successful searching of electronic databases depends on, among other things, an understanding of the topic you are researching about; the development of proper search strategy; possession of computer skills, knowledge of the content and format of the database, and of the search display and output commands; the awareness that the computer only searches for words and phrases and not for interpretations; as well as the ability to break your topic into concepts that are easily searched. According to Adeoye (2003) users of electronic databases must have the full grasp of what they are researching into as well as the required skills in searching electronic databases for them to get the best result.

Categories of Electronic databases

The categories of electronic databases available include:

Free access databases: They are available in the public domain for accessing free of charge e.g. Gale.

Subscription-based/Proprietary databases: Access is granted only after payment of specified amount known as subscription e.g. EBSCO.

Single databases: This category of databases usually focus on specific product or product selling subscriptions to individual database titles e.g. Encyclopaedia of Astronomy and Astrophysics.

Database families: Database families comprise of a wide range of databases. Access granted to a wide range of databases through database families e.g. EBSCO.

Subject specific databases: This category of databases focuses on particular subject area. Electronic databases can be found in every subject areas e.g. Science databases online, Encyclopaedia of science and technology

Benefits of using Electronic databases

Various benefits accrue form the use of electronic databases. Electronic databases allow users to carry out the same tasks as paper-based but with the following advantages;

1. Increase speed. Speed of accessing information is increased with the use of electronic database. Speed of accessing information gives electronic databases edge over the use of traditional print based instructional materials (Carol, 2001).
2. Electronic database is easy to use. It stores very large amount of information thereby offering users opportunities to have access to diverse range of information.
3. It allows the sharing of one set of information amongst many users and therefore reduces duplication.
4. Elimination of duplication prevents the problems of keeping several copies of the same database up to date and in line with each other.
5. It allows for easy searching and selection of information.

Electronic databases Use in Schools: Implications for School Library Media Centre and School Media Specialists

The function of the School Library Media Centre (SLMC) and the role of School Library Media Specialist (SLMS) continue to change as technologies revolutionize information retrieval and use. As more teaching supplements and topical information are made available in electronic format School Library Media Centres (SLMCs) find themselves in a more challenging electronic environment while School Library Media Specialists (SLMSs) look more to online and other electronic sources to meet the information needs of students and teachers. The SLMCs are being transformed into spaces where students can learn and use electronic resources with the support of educators who have such abilities. Thus, according to Craver (2006) access to information, whether by CD-ROM, Internet as well as online databases is overtaking ownership of information as an evaluation benchmark.

Carol (2001) highlighted that the addition of technology into the learning environment enhances information retrieval and offers the school library media specialists a new entrée into the classroom curriculum. Therefore, as schools change from passive learning environment into active ones, the role of SLMSs has to adjust to the new learning environments. The School Library Media Specialists would need to venture from the library to collaborate with teachers and administrators in ensuring the proper integration of relevant electronic databases and other electronic resources into curriculum delivery process. New, more student-centred teaching methods demand the support of information resources and training in their use.

Moreover, the School Library Media Specialists should be knowledgeable in the management of electronic databases. Such databases may need to be loaded onto the Media centre network of computers or access software might need to be installed. The SLMSs/Teacher librarians must be network literate. While the free access electronic databases available in the public domain do not require the SLMS to manage them, teaching users, (i.e. students and teachers) how to access and successfully search the databases is one major role that the School Library Media Specialists should take up. Cradler and Bridforth (2002) emphasized that

the SLMSs should be knowledgeable in the process of selecting electronic resources and evaluating their quality and should be able to pass same across to the teachers and students.

Subscribing to electronic databases is another challenge which the SLMS should take up. This is due to the fact that subscribing to online databases usually gives the SLMC access to an enormous number of electronic resources. There are also an enormous number of free electronic resources that the SLMC can access for use. Subscription-based electronic resources require registration in order to activate online access after the license agreement has been signed, Some Publishers allows subscription agencies such as EBSCO and SWETSWISE to register resources on the librarys' behalf. Most times Publishers require the library to register directly with them and this poses a challenge. The preferred method of access is by Internet Protocol (IP) authentication but some Publishers only offer access via username and password. Some of those who offer access by IP authentication limit the number of IP addresses that the library can include, which restricts access by all users.

The SLMSs should also be ready to develop effective locator tools to make the electronic resources more readily available to users. He should bring value added components and indexing into the enormous number of resources available online. This will facilitate easy access and locating of information by users. The SLMS should also function as an intermediary between the database providers and the users.

The SLMSs should also be able to assist teachers and students to search out their information needs, and critically evaluate the materials to locate and use technological means to sythsesise their finding into new knowledge just as Brown (2002) emphasized the need for SLMSs to be proficient in the use of electronic databases to promote the use and instruct students and teachers in their use. Craver (2006) also emphasized the necessity of teachers and students to use electronic databases and points out that guiding them to select the most appropriate electronic database is a sizeable task that requires concentrated analysis which the SLMSs must be ready to do. Fitting electronic databases into the patterns of information location and application is a task particularly suited to the training and skills of SLMSs.

Free Access Electronic Databases (for Schools)

Intute. available at www.intute.com. This is a database family comprises of single databases on various subjects. The database provides access to online resources on various subjects such sciences, social sciences, arts, and health education, and in various formats e.g. images, videos, e-books etc.

SoftSchools.com. available at www.softschools.com. The database provides interactive online resources especially on mathematics, English language and science. It provides access to free math worksheets, free math games, grammar quizzes and free phonics worksheets and games. Worksheets and games are organized by grades and topics. The grading is from Pre-K to Middle school (Pre Nursery to Junior Secondary School).

Online Biology Book (BioBook). available at www.emc.maricopa.edu. This database provides access to online Biology book.

2020ok. available at www.2020ok.com. It is a directory of free online books on all subjects. Its strength lies in the availability of resources for children between ages 4-12. It also has comics and graphic novels that may attract the attention of children and youths e.g Spiderman, Batman etc

abcteach. available at www.abcteach.com. It provides free access to online resources on science, mathematics and education.

Cell and Molecular Biology online, available at www.cellbio.com. Molecular Biology Notebook online is a comprehensive package for the hands-on teaching of Molecular biology. It provides access to general resources, courses and texts, images and videos, current research findings, online publications among others.

Sparkle box foundation. available at www.sparklebox.co.uk. Provides access to over 1000 free resources for children on alphabets, signs and labels.

Teacherfiles.com. available at www.teacherfiles.com. It provides free teaching resources and teaching aids for classroom.

Junior Reference Collection. available at www.nova.edu. Provides access to the all award winning resources including content based on National Curriculum Standards in major subject areas such as history, literature, science and social studies.

Subscription Based Electronic Resources (for Schools)

Power Library. also known as the Pennsylvania Online World of Electronic Resources, available at www.powerlibrary.net. It provides access to resources on all subjects.

BCR, available at www.bcr.org. The collection offers a great list of online databases at discount prices.

EBSCO. available at www.ebsco.com. This database offers a variety of reference and literary sources. The combination of user friendly interfaces and quality full-text content for popular magazines, education journals, newspapers, pamphlets, reports, primary sources documents, books, biographies, almanacs, dictionaries, encyclopedias, photos, maps, flags and other reference sources make this database a valuable resource in schools.

Facts On File. available at www.factsonfile.com. This is a reference database that is interdisciplinary, interactive and covers subjects such as science, geography, careers, and American history.

Curriculum Resource Centre. Available at www.nsrconline.org/curriculum_resources/index.html. This is a database that provides fast access to thousands of easily reproduced handouts to supplement text and lesson plans. It includes maps, full colour diagrams, images, experiments, timelines and other visual resources. Subjects include history, government, religion, geography, science, maths and health and fitness.

Gale Info Trac. available at www.galegroup.com. This database is one of the largest database family, containing fourteen databases covering topics such as computer technology, business, health and other disciplines. Full text of many articles is available online. The Info Trac Online searches all the databases at once.

Grolier Online. available at www.scholastic_library.com. This education portal provides access to information from many sources, both print and electronic. It consists of seven databases with the foundation being three of the best known encyclopedias: New Book Encyclopaedia, Grolier Multimedia Encyclopaedia and Encyclopaedia Americana.

OCLC First Search. available at www.oclc.org/firstsearch. This databases provides instant online access to more than 72 databases including several

OCLC databases: OCLC WorldCat, First Search Electronic Collection Online, Article First, PAIS International etc

Reader's Guide FullText. available at www.hwwilson.com. This database is a comprehensive index to popular literature covering all subjects such as education, politics, history, science, sports etc

Science Online. available at www.scienceonline.org. All the content on this database is divided into science curriculum content established by the National Science Education Standards. It enables teachers to access diagrams, definitions, biographies and essays in a specific subject area of science discipline. Content of the essays and diagrams is organized by the National Science Content Standards and Benchmarks for grades six through twelve.

SIRS, available at ww.sirs.com. SIRS knowledge source is a comprehensive database portal, updated daily. It provides information on social issues, science, history, government, the arts and humanities. It contains full-text articles and Internet resources

ERIC. available at www.eric.com is a public access database of journal and non-journal education resource. It is sponsored by IES, the US Department of Education, Institute of Education Sciences and its website contains more than 12 million citations dated between 1966 and the present.

Conclusion

Electronic resources are valuable resources for schools as it ensure access to up to date and relevant information. These resources have brought a change on the educational systems all over the World, including Nigeria. Access to information has greatly improved. In fact there has been a change in the traditional method of lesson delivery. Teachers in the developed world now rely more on the use of electronic resources in their statutory duties. This same process should be adopted in Nigeria. The SLMSs should provide the gateway for these facilities. These reforms in the education sector require a significant commitment on behalf of the SLMCs and SLMSs, especially when there are conflicting needs for limited resources.

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