Global Advanced Research Journal of Educational Research and Review (ISSN: 2315-5132) Vol. 2(10) pp. 211-217, October 2013.
Available online http://garj.org/garjerr/index.htm

Full Length Research Paper

Useful lessons for distance educational course writers lacking capacity for interactive electronic learning material development for the enhancement of web-based distance learning

Godfred Yeboah Annum

Department of Painting and Sculpture, College of Art and Social Sciences, Kwame Nkrumah University of Science and Technology, Kumasi-Ghana
anngodam@yahoo.co.uk or anngodam@gmail.com ; Tel: 233-206973608, 233244793964

Accepted 22 October, 2013

The print technology has remained the first choice of most course writers of distance educational institutions especially in Ghana for delivering learning materials to students, a situation that has denied such students, the derivation of the full benefit of web-based distance learning, in view of its importance in modern pedagogical practice. The difficulty for course writers to develop and deliver web-based Interactive Electronic Learning Materials is accountable for this situation. This is due to the lack of capacity and the failure of many of the distance learning institutions to equip their course writers with the technical knowhow for achieving this. It is on this score that the writer of this article explored the application tools of Microsoft Office Word 2007 for Interactive Electronic Learning Materials development and employed the descriptive and design-based research methods to demonstrate strategies by which course writers could independently develop and deliver learning materials to facilitate e-learning. The methodological procedures emphasised the use of Frames, Tables and Link application tools.

Keywords: Course Writer; Distance Learning; Interactive Electronic Learning Material; Microsoft Office Word

INTRODUCTION

Distance education is undoubtedly one of the most esteemed educational systems for increasing student enrolment without compounding the problem of overcrowding in tertiary institutions. Quite a number of tertiary institutions in Ghana for example have embraced this system and are currently running various degree programmes through this system. For example, the Institute of Distance Learning (IDL) at KNUST, which is mandated by the university to offer off-campus tertiary education and training, currently runs twenty two (22) programmes; fifteen (15) undergraduate and seven postgraduate from various colleges of KNUST (VC'S Report, 2012). By this system, they are able to avail opportunities for applicants who for various reasons cannot be enrolled through the normal stream of admission to pursue and receive degrees in respective programmes. Unfortunately, like any other system, distance education comes with some challenges, significant of which is in the issue of course material development.

Effective Distance education today lays emphasis not only on the print medium but on several other mediums effectively amalgamated as multimedia system to offer the most appropriate cornerstone for effective flexible learning. In Ghana however, most universities running distance education, predominantly use the print technology for communicating with their students even though its limitations and constraints do not enable maximum access to all the learning elements.

Instruction using technology is the key component of distance education because in this system the instructor and the learner are geographically separated. It is therefore, through reliance on electronic devices and print materials that the communication gap can be bridged (NIL, 2000). In an ever changing and ever increasing technological environment, the need for reliance on immerging technologies is essential. It is because of this that computers and computer-based technology become necessary for the ever-increasing demand for education (Keegan, 1990).

The dream of IDL of KNUST for example to collaborate with CHINASOFT/SINOSOFT as well as the hosting of Indian Software Engineer for one year (VC'S Report 2012) is a laudable move to expand its frontiers of learning opportunities in the virtual realm. Notwithstanding this drive towards embracing the virtual classroom system by 2015 (VC'S Report, 2012), the expertise of course writers to develop learning materials in electronic interactive mode is indubitably vital to IDL's anticipated achievements. The writer who has participated in IDL's collaborative meetings of technical stakeholders to strategise in the development of learning models to facilitate its full migration unto the e-learning platform deems capacity building for KNUST lecturers in the area of IELM development as of paramount importance.

In this paper therefore, the writer employs the Design-based Research method (DBR) (van den Akker, 1999) and Descriptive method (Best, 1981) to explore Microsoft Office Word (MS Word) 2007 application tools for developing IELM, focusing on frames, tables, bookmark and hyperlink functionalities. Since academic content materials vary with respect to specific academic programmes, the methodological procedures are described in generic terms.

Ms Word 2007 Capabilities

MS word is one of the most widely used general-purpose applications software programmes. It is a word processing tool for creating, formatting, editing, saving and printing any type of word-based document such as letters, report, memo, resumes research papers, email message and even web pages (Haag S. et al, 2002 a). Unfortunately, its web page capabilities are unknown to many users of the programme. This was evident at a 2012 IELM development workshop organised by the writer where participants who were introduced to the capabilities of the MS Word programme for IELM, were not aware of its capabilities in this respect.

Indubitably, majority of professional web designers prefer commercial programmes such as iWeb, FrontPage, Adobe Dreamweaver, NetObjects Fusion, Amaya, just to mention a few for creating, editing, and updating web pages and websites (Wales, 2007). Unfortunately, these programmes are not counted among the popular basic programmes for today's computer users. As the most widely used application programme by scholars in academia for text-based documentation a description of MS Word web designing capabilities will obviously equip many course writers especially at KNUST with the necessary capacity for digitizing print documents for IELM development to facilitate e-learning.

Customisation of Ms Word 2007 for Web Page Designing

MS Word 2007 and 2010, come with a new look characterised by three significant features different from the menu-bar of the older versions. These are the Microsoft Office Button, the Quick Access Toolbar and the Ribbon. All the commands (tools for executing tasks) for processing text-based data are stored in these panels. There is the need therefore, to customise the programme to suit specific operational needs

Customizing to Auto Save as HTML Format

For web page designing, the first recommended customisation setting is in respect of format for saving web page HTML files. By customizing, the programme automatically selects the HTML format in the save as dialogue box. To do this;

- Click the Office button, and then click Word Options.
- Click the Save category.
- From the "Choose how document are saved," drop down the "Save files in this format" list box.
- Select conventional Web Page (html). *Not Single file web page (html) nor Web Page Filter (html)*

The Quick Access Tool Bar

By default, the quick access toolbar is located above the top left portion of the ribbon tabs. Each tab opens its respective ribbon panel when it is clicked. Each ribbon is divided into groups of tools for executing specific tasks. The quick access toolbar provides the space for users to pin command tools from the ribbon panel that are to be used frequently. For convenience and easy accessibility,

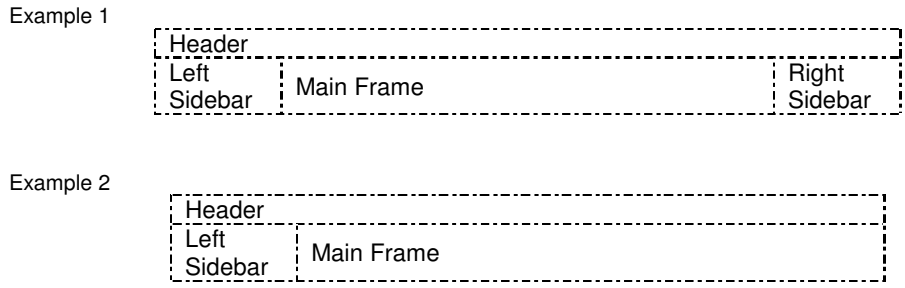

Figure 1 Frame Layout

it is advisable to relocate the quick access tool bar below the ribbon panel by right clicking on the ribbon and selecting that option.

By default, not all commands are displayed on the ribbon. In MS Word 2007, commands, which are not displayed in the ribbons, can be activated from the word options dialogue box under the customised category and pinned to the quick access toolbar. For example, the frame tools, which are of significance in MS Word web page designing, are not displayed in the ribbons.

Pinning Commands or Tools to the Quick Access Toolbar

The following provides a simplified procedure for pinning application tools to the quick access toolbar,

- Click the Office button, and then click Word Options.
- Click the Customize category.
- From "Choose commands from," select "All commands."
- Locate the particular commands and add them to the Quick Access Toolbar.

For web page designing, the following tools must be pinned to the quick access toolbar as follows:

1. Frame Tools: Frames, New Frame Above, New Frame Below, New Frame Left, New Frame Right, Frame Properties, Save Current Frame As and Save as Web page.
2. Table Tools: Insert Columns to the Left, Insert Columns to the Right, Insert Rows Above Insert Rows Below, Split Cells and Merge Cells.
3. Link Tools: Insert Hyperlink and Bookmark

Frame Tools

The use of frames in web pages allows designers to present documents in multiple views in the same window. By using multiple views, some information can be made static whilst others will scroll independently from the others or replaced without affecting the entire window. For example, within the same window, a frame can be inserted at the header to display a static banner, one at the left or right to serve as the sidebar or navigation menu and a large area to represent the main frame that can be scrolled through (Figure 1, examples 1 and 2). Because each frame can display different information simultaneously, frames not only make website well organised but allows users to access the information more easily (O'Leary, 2000).

Table Tools

Tables are very effective method for organising and presenting multiple information on a restricted space or in a single document. The use of table in web page designing allows users to arrange various elements including text, images, forms and nested tables into rows and columns. It also enables the user to associate caption as short description for each table (Figure 2). It helps to align text with ease because of the columns and rows it provides.

Link Tools

In web page designing, a link is a connection from one Web resource to another by the use of link tools (Williams and Sawyer 2005). This is to say that link tools are the instruments for rendering a document its interactive features. To network a system of gadgets is to link them so they can communicate with each other over modems. The link tools in MS Word 2007 constitute bookmark and hyperlinks. They enable the creation of interactive materials so that clients to web pages can connect to other Web resources.

Managing Files Directory

An important segment in IELM development that precedes web page designing project is the management of directories of folders to store the files to be accessed from the virtual classroom on a remote server. In this process, the developer has to presume the local disk (C) as the remote server to nest the root directory with a name that identifies the course e.g. 'Drawing'. The root

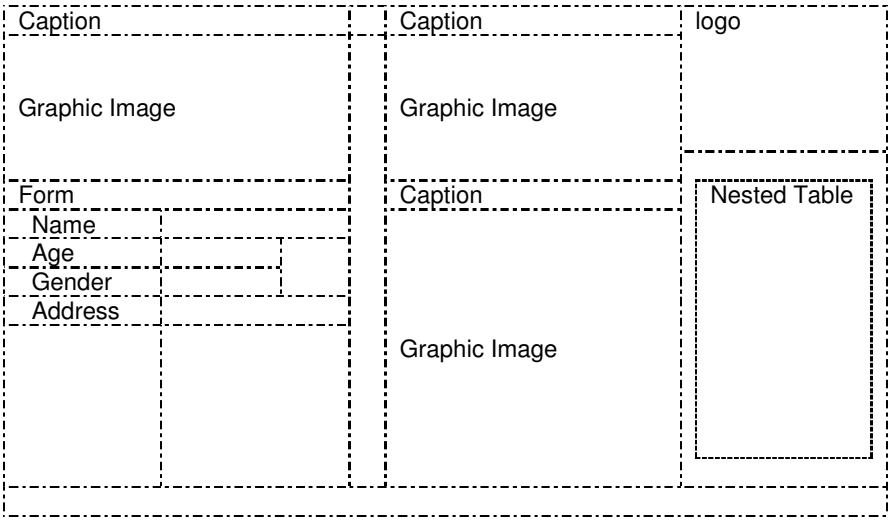

Figure 2 Example of Table Layout

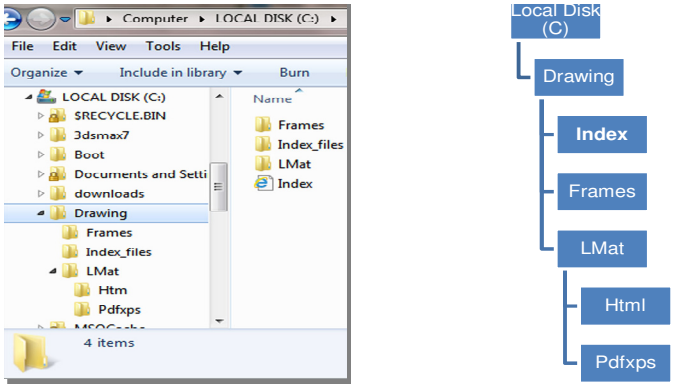

Figure 3 Directory Tree Structure

directory should nest two sub directories, one to store file names of the page frames and the other to store learning materials. The index file should also be saved in the root directory. The Learning Materials folder should also nest two sub directories, one to store PDF and XPS files and the other to store HTML Files. Figure 3 demonstrates the tree structure of the directories for files of a drawing course. It is advisable to use non-spaced words to name the folders.

Methodological Procedures for IELM Development

Construction and Management of Frames

The most demanding, among the processes for web page designing in the MS word work space is the construction and management of frames. This begins with the creation of a new document. There is actually no special way for creating a new document for web page designing other than the usual process of clicking new in the office dialogue box. What is significantly required is to set the page layout to Web Layout before constructing the frames. The 'web layout' is created by selecting 'web layout' under 'Document Views' category in the 'View ribbon'. This stretches the page across the width of the document window.

Step1: Constructing Frames: A new frame is always constructed to the side of the space where the insertion point is clicked and is blinking. From the quick access toolbar, the 'new frame above' tool should be used to construct to the top of the page to serve as the header, followed by 'new frame left' to serve as sidebar or navigation bar. This should leave a larger frame at the right to serve as the main frame (Figure 4). The system will assign frame identification numbers to the frames according to the order of insertion. The numbers are significant in determining how content material will be displayed in the frames. There is also the option to reassign names as *top, left, and main* from the frame properties dialogue box to the respective frames. To do this:

- Open the frame properties dialogue box pinned to the quick access toolbar.

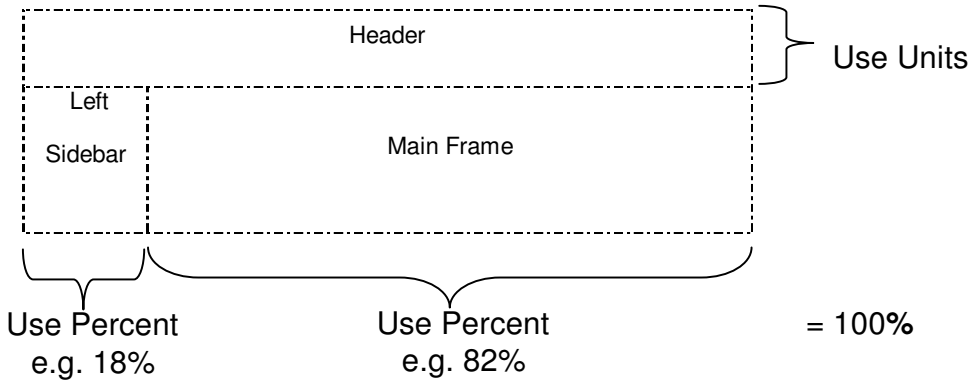

Figure 4 Adjusting Frame Sizes

- Open the frame tab.
- Drop down the name list box.
- Select the corresponding name.
- Click ok to confirm the settings.

*Step 2: Saving Frames***:** After constructing the frames, the next step is to save them to the directory folder. First the entire document will have to be saved into the root directory folder to serve as the index file. The 'save as web page' tool pinned to the quick access toolbar should be used. This should be followed by the saving of the four individual frames. Since frames act independently, each frame should bare a distinguishable name from the other frame(s). It is advisable also, to use a single worded name. The internet browser considers the name of a frame as the target for the file to be loaded in it. Hence each frame must be saved as an HTML file using the conventional web page format. To do this, use the 'Save Current Frame As' tool pinned to the quick access toolbar to save all frames into the 'Frame Directory'.

Step 3: Adjusting Frame Size and Borders: Next is to adjust the frame sizes and indicate whether to show or hide borders. The frame properties tool opens the frame properties dialogue box that has two tabs to control the frame sizes and borders. Under the frame tab, the adjustment can be effected by the respective spin buttons and the appropriate measurement unit. Not only does the borders tab show or hide the frame borders. It also enables the activation of the scrollbar in a particular frame. Frames inserted are independent of the other hence each must be clicked within before adjusting.

As far as the 'left sidebar', and the 'main frame' are concerned, it is recommended that developers use the 'percentage measurement' for the width and 'relative measurement' for the height. The relative size should be fixed at '1' whilst all the column frames should total 100%. For the 'Header' frame, only a height measurement in units is required (Figure 4). Regarding scrollbars, it is recommended that 'if needed' among the three options under 'show scrollbar in browser' list box under the 'borders tab' of the 'frame properties' dialogue box is selected. This implies that the scrollbar will only show when list of items in the frame exceed the height of the Frame.

As a matter of importance, in an e-learning web page designed with frames as shown in Figure 4, the left sidebar should be set aside to load the Table of Content panel. The header is always a banner to identify the page. The table of content should display lesson topics, which should be linked to load content materials into the main frame. Regarding content materials, the use of tables in managing data in a web page not only renders the page attractive but also increase readability (O'Leary, 2000). However, a developer is at liberty to ignore its usage when the page will only contain simple text elements. As a result of the use of document formats like margins and tabs in creating pages, it is again recommended that PDF or XPS format is used to save these pages in order to preserve the document formats. For easy location, all HTML formatted content material must be saved into the 'html' directory and PDF or XPS materials into 'Pdfxps' directory folder (Figure 3).

Working with Bookmark and Hyperlink

Bookmark and hyperlink are the technologies used to bring interactivity into web pages. A bookmark is a scheme that is used to identify a location, a block of text or other content materials within a word document (Haag S. *et al*, 2002 b). Hyperlink is a technology for performing interactive actions in a document so that users can jump from one location to another in the document or open another document or navigate to a Web page. Microsoft Word supports these two technologies hence enable users of word based documents to locate areas in the document by the click of a hypertext without necessarily scrolling through the document. These two technologies are very critical in facilitating IELM development in MSWord.

Step 1: Activating Bookmark Visibility: For starters, it pays to see the bookmarks when inserted. This requires that bookmark visibility is activated. Once activated, it will

only show whilst the document is opened in Office Word and not in the browser. To activate bookmark visibility:

- Click the Office Button
- Open Word Options
- Select Advance category
- Under 'Show document content', check 'Show Bookmarks'
- Click OK to confirm this customization.

Step 2: Inserting Bookmarks: Once a document has been saved in the right format (HTML), bookmarks can be inserted at points the instructor wishes to link the learner to. To do this;

- Insert the 'insertion point' at the location in the html document.
- Click the 'bookmark' tool, pinned to the quick access toolbar to open the bookmark dialogue box. The tool can also be located under the links group in the insert ribbon.
- Type a single-worded name to identify that location. (Spaced words are not allowed).
- Click the 'Add' button to add the name to the list.
- To delete a bookmark, select it and click the Delete button to remove a name from the list.

It is required that anytime bookmarks are inserted, the document has to be saved before inserting hyperlinks.

Step 3: Inserting Hyperlink: The hyperlink tool enables the developer to link a word or any other element in a document to a bookmark within the same document. It can also link an element in a document to another web page. An element in a document can also be linked to a bookmark in another document so that the document opens and automatically scroll the page to the line of the bookmark. Any text that is linked to another document becomes a hypertext.

To create a hyperlink to a bookmark,

- Select the text to be linked to the document.
- Click the hyperlink tool on the quick access toolbar to open the Insert Hyperlink dialog box. The tool can also be located under the 'links' group in the 'insert ribbon'.
- In the 'Insert Hyperlink dialog box', determine whether the text is to be linked to an existing file/web page or to a place in the same document by selecting the appropriate option under the 'Link to' buttons.

To link to a place in the same document,

- Click 'Place in This Document' under 'Link to' section. All the bookmarks will be populated within the 'select a place in this document' window in the dialogue box.
- Select the name of the bookmark that is to be the destination of the hypertext.
- If you want to specify a personalized screen tip, click 'ScreenTip' and type the text that will appear when the mouse rolls over the hypertext.

To link to a existing file or web page,

- Click 'Existing File or Web page' under 'Link to' section.
- In the 'Look in' section, click 'Current Folder' and navigate into the specific folder to locate the file of the document to be linked and click 'OK'.
- If the link is to a bookmark, then after selecting the file, click the bookmark button to open the bookmark dialogue box and select the name of the bookmark that is to be the destination of the hypertext and click 'OK'
- If you want to specify a personalized screen tip, click 'ScreenTip' and type the text that will appear when the mouse rolls over the hypertext.

Defining Target Frame to Load Learning Materials

At any instance that a link is created, there is the need to define a target frame for the document. The 'insert hyperlink' dialogue box is fitted with a 'target frame' button to open the 'Set Target Frame' dialogue box. The 'set frame' dialogue box provides four options: Same Frame, Whole Page, New Window and Parent Frame to determine where the document should be displayed.

Same frame: This target causes the link to load in the same window where the action originated.

Whole Page: This target makes the link load in the full body of the same browser, overriding the existing frame structure.

New Window: This target makes the link load in a blank window or a new tab.

Parent Frame: This target makes the link load in the immediate Frameset parent of the current frames.

When frames are used to develop a web page, the names assigned to the frames enable the developer to target them to display documents. For example, the left sidebar (Figure 4) by whatever name assigned to it, is targeted to load the table of content page whilst the main frame is targeted to display all learning materials when a topic in the table of content is clicked.

Every website has a home page, which constitutes the first page that appears when one enters the site. It is opened by the index file. A page that opens in the home is the first landing page. Using multiple frames will therefore, require first landing page for each frame. It is recommended that all the first landing pages be saved as HTML files from where the visitor will be linked to other pages.

To target a frame to load its first landing page,

- Click inside of the frame and open the frame properties dialogue box.
- On the frame tab, ensure that the name of the frame is selected in the name list box
- Click the 'browse' button to navigate the windows explorer to open html file.
- Ensure that the 'link to file' check box is checked.
- Click OK to confirm the settings

To target a frame to display a document when a hypertext is clicked,

- Selected the text to be linked.
- Click the hyperlink tool on the quick access toolbar to open the Insert Hyperlink dialog box.
- In the 'Insert Hyperlink dialog box', locate the document (HTML, PDF or XPS) to be opened. The document can be in the document directory or from other websites.
- Click the target frame button to open the set target frame dialogue box.
- You can either select the frame option from the 'current frame page' that previews the frame structure or drop down the list of options where the document is to appear and select the frame name.
- Click OK in the dialogue boxes to confirm the settings and save the page

This action should be performed for all texts and objects to trigger the opening of documents. The index page should be saved before testing in the web browser.

Testing of Web pages

Testing of Web pages is critical for ensuring a successful Website with links to pages on the World Wide Web (www) working effectively. Even though testing can be done on the local workstation, there is the need to connect to the internet to establish accessibility links to webpage documents on other websites so that broken links could be restored before opening to the public or private users. Test MS Word-based webpage should always start with the opening of the index file in the root directory. The processes discussed so far in this paper was used to successfully develop three open resource materials for undergraduate students in the Department of Painting and Sculpture at KNUST in Ghana most of whom reside off campus. (http://campus.educadium.com/newmediart/file.php/1/giilmadstore/UgradResearch/acaResearch_index.htm)

CONCLUSION

The writer in this paper has highlighted the need for a reliance on not only the print technology for delivering learning materials but most importantly the electronic medium to offer flexible learning opportunities in distance education. Through this exploration, the technical knowhow for using MS Word programme to convert text-based course materials into electronic mode have been discussed to help course writers build the capacity in electronic learning material development. The focus has been in the areas of customising MS Word 2007 for web page designing, management of file directory and methodological procedures for IELM development which has most importantly dealt with working with bookmark and hyperlink.

Even though this paper has not exhaustibly dealt with all the web-designing capabilities in MS Word, the writer has managed to expound the most salient procedures to provide some useful lessons to equip distance education course writers with the necessary skills for converting text-based course materials into electronic mode. This is to help facilitate the production and delivering of interactive learning materials to complement the widely favoured print mode.

REFERENCES

'NIL' (2000). *"How states are implementing distance education for adult learners"*, National Institute for Literacy, http://wdr.doleta.gov/research/pdf/nifldistance.pdf. Accessed March 21, 2009).

Best JW (1981). Research in Education, Prentice-Hall, Inc. Fourth edition.

Haag S, Perry JT, Parker R and Wells M (2002 a). The I-Series Microsoft Office XP Vol. I Expanded, McGraw-Hill Companies, Inc.

Haag S, Perry JT, Parker R and Wells M (2002 b). The I-Series Microsoft Office XP Vol. II Expanded, McGraw-Hill Companies, Inc.

Keegan D (1990). *Foundations of Distance Education*, Routledge, London.

O'Leary TJ and O'Leary LI (2000). The O'Leary Series Microsoft Word 2000, Introductory Edition, McGraw-Hill Companies, Inc.

Van den Akker J (1999). Principles and Methods of Development Research. In J. van den Akker, N. Nieveen, R. M. Branch, K. L. Gustafson and T. Plomp (Eds.), *Design Methodology and Developmental Research in Education and Training*, The Netherlands: Kluwer Academic Publishers.

VC'S Report (2012). Vice Chancellor's Report, 46th Congregation, Kwame Nkrumah University of Science and Technology, Kumasi.

Wales J (2007). Wikipedia Free Encyclopaedia, *Educational Technology*, (http://en.wikipedia.org/wiki/Web_design_program, last modified on 18 June 2012 at 11:08, Accessed August 20, 2012).

Williams BK and Sawyer SC (2005). Using Information Technology, a Practical Introduction to Computers and Communications, Complete Version, Sixth Edition, McGraw-Hill Companies, Inc.