# Competency Needs of Computer Studies Teachers for Effective Teaching of Web Design

**Ezugwu, M. O., Ibezim, N. E., and Kalu, E. U**
Department of Computer & Robotics Education,
University of Nigeria, Nsukka

**Abstract**

The purpose of this study was to ascertain the competency needs of computer studies teachers for effective teaching of web design. The population for the study is 120 computer studies teachers in secondary schools in Nsukka educational zone. A random of 93 respondents was drawn using a random sampling technique. Five research questions guided the study. A structured questionnaire was used for data collection. Data were analyzed using mean and standard deviation. The findings revealed that teachers highly need competencies in creating web page using HTML coding, using cascading style sheet, creating web page using Adobe Dreamweaver building websites and maintaining and updating websites. Based on the research findings, it was recommended among others that the secondary schools in Nsukka educational zone should organize workshops and seminars for computer studies teachers to help them acquire the needed competencies on web design and development.

**Keywords**: Competency, Computer, Studies, Teachers, Web Design

## Introduction

A teacher is a person who gives instructions or lesson on a subject to learners. A teacher, also called a school teacher, is a person who provides education for students. MacLean and Mohr (2009) explained that the term 'teachers' are subjective insiders involved in classroom instruction as they go about their daily routines of instructing students, grading papers, taking attendance, evaluating their performance as well as looking at the curriculum. Teachers raise questions about what they think and observe about their teaching and their students' learning. They collect work in order to evaluate performance, but they also see student work as data to analyze in order to examine the teaching and learning that produced it. A teacher's role may vary among cultures. Teachers may provide instruction in literacy and numeracy, craftsmanship or vocational training, the arts, religion, civics, community roles, or life skills. A teacher who facilitates education for an individual may also be described as a personal tutor or role model largely

historically, a governess. Marlene (2007) further stated that a teacher is a role model and a role model is a person who inspires and encourages people to strive for greatness, live to their fullest potential and see the best in themselves in diverse economic situations which includes a recessed economy.

A recession is a general downturn in any economy. Recession according to Mckinney (2016) is the contraction phase of a business cycle. It begins after the economy reaches a peak of activity and ends as the economy reaches its trough. A recession is associated with high unemployment, slowing gross domestic product, and high inflation. Economic recession is a period of general economic decline and is typically accompanied by a drop in the stock market, an increase in unemployment, and a decline in the housing market. According to Nash (2012), a recession is a period of decline in total output, income, employment and trade, usually lasting u months to a year and marked by widespread contractions in many sectors of the economy. Youths (students) need to be equipped for survival in a recessed economy. Therefore, teachers need to be fully competent and equipped to help their students acquire the necessary skills needed to survive and help their families in time of recession. In doing this, teachers may follow standardized curricula as determined by the relevant authority. The teacher may interact with students of different ages, from the infants to the adults. In this study, secondary school students are of interest to the researchers. The reason for this is based on the fact that if at graduation the students already are equipped with viable entrepreneurial skill, they would start in good time to make good use of their spare time, cater for their needs and to support their families.

One of the courses studied at the secondary school level in Nigeria is Computer Studies which is the study of computer to enable students to use the computer in various spheres of live to solve societal problems and later occupation. This era ushered in the advent of computer system among other modern technologies. At present, the computer technology has permitted nearly all aspects of human organizational roles and education. Computer encompasses almost all areas of human disciplines, which include computer/information technology, agriculture etc. Today, computer technology in schools is one of the most far reaching and fast growing developments in education. The incursion of electronic computer system into the educational parlance, according to Sherman (2005) provides the wherewithal to solve teaching and learning problems even more rapidly and accurately than hitherto conceived. This has eventually made the computer system the doyen of humanity as it continues to exert greater acceptance. One skill area in Computer Studies that has the capacity of improving the economic prowess of individuals is web design and development.

Web design and development encompasses many different skills and disciplines in the production and maintenance of websites. Often, many individuals will work in teams covering different aspects of design process, although some designers will cover them all. The term web design is normally used to describe the design process relating to the front-end (client side) design of a website including writing mark up. Web design partially overlaps web engineering in the broader scope of web development. Web designers are expected to have an awareness of the usability and if their role involves creating mark up, they are also expected to be up to date with web accessibility guidelines. According to Jegede (2007), the different areas of web design include web graphic design; user experience design; and search engine optimization. Web design involves creating web page design using HTML, styling and formatting web pages using Cascading Style Sheet, using Adobe Dreamweaver to create web pages, building website, maintaining and updating website.

The acquisition of web design skills will equip students with skills that will make them IT compliant. Students will have wide knowledge of the Internet which is the best platform for businesses and other online activities. Web design skills and competencies can boost the economic status of students because websites are widely used in virtually every aspect of life. When students have the competency, they can design websites for individuals and organizations based on their needs and make money from it. This will help in making students to be self-employed upon graduation, and will in turn boost the economic status of their families.

The question now is whether teachers are competent enough to handle web design for students to enable them make a living out of it. For instance, teachers themselves need to be well grounded in creating web pages using HTML, styling and formatting web pages using Cascading Style Sheet, using Adobe Dreamweaver to create web pages, building website, maintaining and updating website which are all aspects of web design to be able to help students acquire the skills. There is therefore, need for this study to find out the competency needs of computer studies teachers for effective teaching of web design

**Statement of Problem**
Information technology (IT) is a growing field that offers relatively secure positions for those with solid technical skills and there are several specializations that deal with the various facets of information technology that include web design and development. This is a field that can help undergraduate students to make a living to cope and help their families survive both in recession and out of recession. However, it is observed that many students and graduates of the secondary schools in Nsukka educational zone lack this economy booster skill. This clearly shows that they are not reaping the

benefits of web design and development as part of the courses to be learnt. This scenario is so because, it has also been observed may computer studies teachers who are in the position to impart this skill are not competent enough. This is the researchers felt that the very first step in alleviating this challenge is to identify the teachers' competency needs as regards the teaching of web design and development, in order to equip them with the skill gaps for better impartation on students, who will in turn use the imparted skills for economic gains and survival in the recessed economy.

## Purpose of the Study

The main purpose of this study was to determine the competency needs of computer studies teachers for teaching web design and development in secondary schools in Nsukka educational zone. Specifically, the study determined the competency needs of the teachers in

1. creating web page design using HTML
2. styling and formatting web pages using Cascading Style Sheet.
3. using Adobe Dreamweaver to create web pages
4. building website.
5. maintaining and updating website.

## Research Questions

Five research questions were posed to guide this study. They are as follows; what are competency needs of computer studies teachers in

1. creating web page using HTML coding?
2. styling and formatting web pages using Cascading Style Sheet?
3. using Adobe Dreamweaver to create web pages?
4. building website?
5. maintaining and updating website?

## Methodology

This is the procedure that is used to carry out this study. It is discussed under the following subheading:

*Area of the Study* The area of the study was Enugu State. The unit of observation in the study was Nsukka Educational Zone. Nsukka LGA was chosen because there are many secondary schools in the area offering computer studies and to the best of the researchers knowledge, students graduate from these schools without acquiring any skill on computer studies and web design which is supposed to boost their relevancy after graduation.

*Design of the Study* This study adopted a descriptive survey research design. A descriptive survey design according to Ali (2006) is one of which uses sample of an investigation to document, describe and explain what is in existence or non-existence on the present status phenomena being investigated. In descriptive survey study, views and facts are collected through questionnaires from teachers on the competency needs of computer studies teachers for effective teaching of web design for family survival in a recessed economy.

*Population for the Study* The population for this study was 120 Computer Studies Teachers in the 59 government owned secondary schools in Nsukka Educational Zone of Enugu State.

*Sample for the Study* The sample was drawn using Taro Yamane formula. By the formula, the researcher arrived at 93 as the sample size out of the entire population of 120 computer teachers in the above mentioned study area. For the sake of this research therefore, 93 respondents were randomly selected without replacement out of the entire population for analysis.

*Instrument for Data Collection* The instrument for data collection was a structured questionnaire. The instrument was titled "Teachers' competency". The questionnaire were made up of two section, A and B. Section A consisted of five clusters A,B,C,D, and E. Cluster A consisted of items seeking the personal information of the respondents. Cluster B was used to gather information on the competency needs of computer studies teachers for effective teaching of web design for family survival in a recessed economy. Cluster B was used to gather information on the competency needs of computer studies teachers in creating web page using HTML coding. Cluster C elicits the competency needs of computer studies teachers in using Adobe Dreamweaver to create web pages. Cluster D elicits of the competency needs of computer studies teachers in building websites. Cluster E elicits the competency needs of computer studies teachers in updating websites. The responses on the questionnaire were on a 4 point rating scale namely: Highly Needed (HN), averagely Needed (AN), Slightly Needed (SN), Not Needed (NN)

*Data Analysis* One hundred and twenty copies of the questionnaire were administered on Computer Studies Teachers and all the copies distributed were retrieved and analyzed using mean and standard deviation. Any item with a mean of 3.50 and above was regarded as needed while any item with a mean less than 3.50 was regarded as not needed.

## Results

The results are presented in line with the research questions.

**Research Question 1:** *What are competency needs of computer studies teachers in creating web page using HTML coding?*

**Table 1:** Mean scores and standard deviation on the competency needs of computer studies teachers in creating web page using HTML coding?

| S/N | Item Statement | X̄ | SD | Decision |
|-----|----------------|-----|------|----------|
| 1. | Ability to turn on the computer | 4.50 | 0.00 | Highly Needed |
| 2 | Ability to locate HTML from my computer programs | 3.94 | 0.22 | Highly needed |
| 3 | Knowledge of writing HTML codes | 3.90 | 0.39 | Highly needed |
| 4 | Ability to access the internet | 3.78 | 0.56 | Highly needed |
| 5 | Any knowledge of world wide web | 3.81 | 0.41 | Highly needed |
| 6 | Know the full meaning of HTML | 3.82 | 0.45 | Highly needed |
| 7 | Ability to create a file using HTML | 3.73 | 0.59 | Highly needed |
| 8 | Knowledge of inserting tables in HTML | 3.65 | 0.68 | Highly needed |
| 9 | Ability to create a site in HTML | 3.86 | 0.43 | Highly needed |
| 10 | Knowledge of choosing a Universal Resource Locator or local root in HTML | 3.87 | 0.42 | Highly needed |
| 11 | Ability to create blogs in HTML | 3.60 | 0.73 | Highly needed |
| 12 | Competent in choosing site content | 3.81 | 0.46 | Highly needed |
| 13 | Skill of creating a database in HTML | 3.79 | 0.50 | Highly needed |
| 14 | Knowledge of syntax usage in HTML | 3.75 | 0.58 | Highly needed |
| 15 | Able to edit HTML codes | 3.76 | 0.55 | Highly needed |

**Key**: X̄= Mean, SD = Standard Deviation

Table 1 shows the mean distribution on competency needs of computer studies teachers in creating webpage using HTML coding. Items 1-15 had mean scores ranging from 3.60-3.94; therefore, the decision is "Highly Needed" indicating that teachers' need the competencies in creating web page using HTML coding.

**Research question 2:** *What are competency needs of computer studies teachers in styling and formatting web pages using Cascading Style Sheet?*
The research question was answered using items 1-12 in Table 2.

**Table 2:** Mean scores and standard deviation on the competency needs of computer studies teachers in styling and formatting web pages using Cascading Style Sheet

| S/N | Item Statement | X̄ | SD | Decision |
|-----|----------------|-----|------|----------|
| 1. | Ability to turn on the computer | 3.64 | 0.71 | Highly Needed |
| 2 | Knowledge of what CSS is | 3.87 | 0.42 | Highly needed |
| 3 | Ability to launch CSS in your computer | 3.79 | 0.52 | Highly needed |
| 4 | Competent on saving designs in CSS | 3.73 | 0.59 | Highly needed |
| 5 | Ability to use CSS to provide a list of formatted instructions | 3.79 | 0.56 | Highly needed |
| 6 | Skills on using CSS to display the web page differently irrespective of the device size | 3.80 | 0.42 | Highly needed |

| 7 | Expert on using CSS selectors to declare the part of the markup or style applied to the machine tags | 3.74 | 0.58 | Highly needed |
|---|---|---|---|---|
| 8 | Knowledge of how to CSS use pseudo-classes as a selector to permit formatting based on information that is not contained in the document tree. | 3.70 | 0.52 | Highly needed |
| 9 | Competent on how to use CSS to grant users greater control over presentation. | 3.80 | 0.47 | Highly needed |
| 10 | Have idea on how to use CSS to style XHTML and XML markup | 3.80 | 0.55 | Highly needed |
| 11 | Ability to use CSS to define how Web pages should look when viewed in other media than a browser | 3.77 | 0.57 | Highly needed |
| 12 | Competent on how to use 60 major properties of CSS | 3.88 | 0.35 | Highly needed |

**Key**:   X = Mean, SD = Standard Deviation

Table 2 shows that all the items 1-12 had mean scores ranging from 3.64-3.88 indicating that teachers highly need these competencies for styling and formatting web pages using Cascading Style Sheet.

**Research question 3:** *What are the competency needs of computer studies teachers in using Adobe Dreamweaver to create web pages?*
Data for answering this research question is shown in Table 3.

**Table 3:** Mean scores and standard deviation on the teachers' competency needs in using Adobe Dreamweaver to create Web pages.

| S/N | Item Statement | X | SD | Decision |
|---|---|---|---|---|
| 1. | Ability to turn on the computer | 3.96 | 0.31 | Highly Needed |
| 2 | Knowledge of  Adobe Dreamweaver | 3.88 | 0.50 | Highly needed |
| 3 | Ability to launch  Dreamweaver | 3.79 | 0.56 | Highly needed |
| 4 | Expert in launching into the code environment in Dreamweaver | 3.80 | 0.51 | Highly needed |
| 5 | Skill in choosing a programming language to work with in Dreamweaver | 3.75 | 0.58 | Averagely needed |
| 6 | Ability to open a chosen language | 3.72 | 0.51 | Highly needed |
| 7 | Expert  in opening a saved site in Dreamweaver | 3.83 | 0.44 | Highly needed |
| 8 | Ability to save site in Dreamweaver | 3.87 | 0.42 | Highly needed |
| 9 | Skill in creating blogs in  Dreamweaver | 3.86 | 0.50 | Highly needed |
| 10 | Ability to edit pictures in  Dreamweaver | 3.80 | 0.47 | Highly needed |
| 11 | Skill in using  Dreamweaver design and planning tips on the web page | 3.77 | 0.57 | Highly needed |
| 12 | Idea of glossary terms and useful resources in Dreamweaver | 3.78 | 0.50 | Highly needed |

**Key**:  X= Mean, SD = Standard Deviation

Table 3 shows that all the items 1-12 had mean scores ranging from 3.96-3.72 indicating that teachers highly need these competencies for using Adobe Dreamweaver to create web pages.

**Research question 4:** *What are competency needs of computer studies teachers in building website?*

This research question was answered using items 1 to 13 in Table 4.

**Table 4:** Mean scores and standard deviation on the competency needs of computer studies teachers in building website

| S/N | Item Statement | $\overline{X}$ | SD | Remark |
|---|---|---|---|---|
| 1 | Knowledge of (ISP) Internet Service Provider for hosting a website | 3.92 | 0.36 | Highly Needed |
| 2 | Ability to launch www.smartwebng.com through FileZilla | 3.69 | 0.52 | Highly needed |
| 3 | Idea on how to choose the domain name. | 3.82 | 0.45 | Highly needed |
| 4 | Expert on how to check availability of the chosen domain name. | 3.84 | 0.44 | Highly needed |
| 5 | Idea of when domain name is accepted for registration or not | 3.74 | 0.46 | Highly needed |
| 6 | Ability to check the duration of the site i.e. how long it will last when hosted | 3.80 | 0.47 | Highly needed |
| 7 | Expert in managing hosting windows | 3.90 | 0.39 | Highly needed |
| 8 | Skill on how to use syntax in domain configuration | 3.91 | 0.38 | Highly needed |
| 9 | Ability to use syntax in domain configuration | 3.83 | 0.53 | Highly needed |
| 10 | Skill on accessing site password through the home pages | 3.89 | 0.40 | Highly needed |
| 11 | Expert on interpreting the account information well when uploaded to avoid errors while hosting | 3.81 | 0.55 | Highly needed |
| 12 | Competent in sending password to my control panel for the manipulation of my web page | 3.80 | 0.55 | Highly needed |
| 13 | Knowledge of how to trace root server when any error occur during uploading of files while hosting a site | 3.96 | 0.31 | Highly needed |

**Key**:  X= Mean, SD = Standard Deviation

Table 4 shows that all the items 1-13 had scores ranging from 3.92-3.96 indicating that teachers highly need these competencies for building website.

**Research question 5:** *What are teachers' competency needs in maintaining and updating website?*
This research question was answered using items 1 to 7 in Table 5.

**Table 5:** Mean scores and standard deviation on the competency needs computer studies teachers in maintaining and updating website

| S/N | Item Statement | $\overline{X}$ | SD | Decision |
|---|---|---|---|---|
| 1. | Competent in activities that comprise website maintenance to ensure the operational integrity of a website | 3.88 | 0.41 | Highly Needed |
| 2 | Knowledge of how website publishing is needed to keep content up-to-date | 3.82 | 0.45 | Highly needed |
| 3 | Skill on website quality assurance, which is used to | 3.83 | 0.53 | Highly needed |

| | | | | |
|---|---|---|---|---|
| | spot errors on a site. | | | |
| 4 | Expert in managing communication with website visitors | 3.78 | 0.56 | Highly needed |
| 5 | Idea of how website infrastructure monitoring can be used to supervise web hosting | 3.82 | 0.40 | Highly needed |
| 6 | Expert on how to change control language, manage technical and other challenges in a coordinated way. | 3.91 | 0.38 | Highly needed |
| 7 | Ability to monitor website performance for update | 3.83 | 0.53 | Highly needed |

**Key**: $\overline{X}$ = Mean, SD = Standard Deviation

Table 5 shows that items 1-7 had mean scores ranging from 3.91-3.82 indicating that teachers highly need these competencies in maintaining and updating a website.

**Discussion on the Findings**
The findings of this study under research question 1 showed that teachers highly needed competency skills in creating web page using HTML coding. These competencies highly needed by computer studies teachers on creating web page using HTML coding include: ability to turn on the computer, ability to locate HTML from computer programs, knowledge of writing HTML codes, ability to access the internet, knowledge of worldwide web, Know the full meaning of HTML, ability to create a file using HTML, knowledge of inserting tables in HTML, ability to create a site in HTML, knowledge of choosing a Universal Resource Locator or local root in HTML, ability to create blogs in HTML, competent in choosing site content, skill of creating a database in HTML, knowledge of syntax usage in HTML and ability to edit HTML codes.

In teaching students how to design web pages, some teachers will spend hours teaching how to set text and images, layout pages and build hyperlinks using outdated web languages like front page, but it can be noticed that in HTML, they can quickly master the technical side of making a web page. The result revealed that computer studies teachers lack the competencies on the necessary knowledge needed to teach web design and development. Many studies are based on data from server access logs, analyzing various aspects of user navigation (Pitkow, 2004; Spiliopoulou, 2003; Nicholas et al., 2004). However, these logs have their limitations: they only report on user actions within a single site, browser caching mechanisms may hide some page revisits, and various specifics on the interaction with the browsing application remained concealed. The results indicated that a certain type of users tended to "navigate" from a search result page, whereas, others displayed a more "exploratory" behaviour by submitting many queries during a search session, jumping between search results and visiting numerous new sites. Another perspective is provided by observational short-term studies. Screen

captures, video coverage, and web diaries have been successfully applied to understand Web browsing activities in various specific contexts (Baker, 2003; Choo, 2002).

The findings in Table 2 showed that teacher competency on the use of cascading styling sheet for styling and formatting web pages are highly needed. Cascading Style Sheet is a web application software that contains lots of formatting features like, font pattern, color layout and overall appearance of a website. They are separated from the HTML structure to reduce repeating the styling of similar elements on multiple pages. A style sheet controls the entire layout of a website. It may only be altered once to have an effect on multiple pages of a website. But majority of the teachers has no knowledge on this, rather their knowledge is limited to word processing, creating files and tables using excel application, browsing the internet for information and doing assignments. CSS is a cornerstone technology used by most web designers to create visually engaging web pages, user interfaces for web applications, and user interfaces for any mobile applications. While XHTML gives web pages their basic structure, CSS define the way they look. Both have recommended standards and together will make a long way to making site accessible giving it a consistent look and feel. Most of the teachers do not have the slightest idea of this software and its application for styling and formatting web pages. This to an extent will help in designing a captivating site and easily too and computer teachers are still far from it in University of Nigeria, Nsukka.

The findings agree with Ajayi, Ekundayo & Haastrup, (2009) that non-availability of internet access in some schools because of the recurrent cost of bandwidth, high cost of personal computers and inequality of access to technology are the challenge teachers of computer encounter in secondary schools. Thus, most of them are unable to afford computers and access time due to the relative cost to the average income of workers in the country. Ukoha (2008) also observed that problems of lack of technology proficiency (mainly with computer and internet usage, operating software, relevant authoring software for web design) and lack of awareness when the server crashes and unreliable technology to maintain web activities are some of the hindrances to web design.

The findings in Table 3 showed that teachers' competency needs in the use of Adobe Dreamweaver is high. Adobe Dreamweaver can combine a visual design surface known as Live View and a close editor with standard features such as syntax highlighting, code completion, and code collapsing as well as more sophisticated features. Real-time syntax checking and code introspection for generating code hints to assist the user in writing code is also available in Adobe Dreamweaver. Using Dreamweaver, students will learn to create simple Web pages as well as

dynamic and comprehensive web sites at ease. It was discovered that computer studies teachers in secondary schools in Nsukka Educational Zone highly need Adobe Dreamweaver competence. Yun et al (2002) agreed with the findings that students with basic computer and internet knowledge who wish to enrich their knowledge of Web publishing tools will have the opportunity to learn the Web editing software that is the factor application in web development.

The findings in Table 4 showed that teachers highly need competency skills on building websites. Web host provides one with details of how to get ones site up and running. Kyrnin, (2007) agreed with the findings that the Internet is nothing more than a large collection of computers attached to a telecommunications network and a set of protocols that establishes the rules for data to be sent and received by them. Most computers are linked to the internet through a modem that directs traffic to and fro a local phone or cable company. An Internet Service Provider (ISP) directs the incoming and outgoing data through a local hub to regional hubs. All the data that makes up a website is located on one or more specialized computers known as servers. This allows most anyone to create a website that is available to the public on the World Wide Web (www), which is the collective network of all website in the world that can be accessed through the internet. In order for computers to understand each other, universal codes and protocols have been established. One of the most

important of these protocols for website and domain hosting is the hypertext transfer protocol (HTTP). It is this protocol that allows queries to be sent to specific servers so that the websites on those servers can be accessed.

The finding in Table 5 showed that teachers highly need competency skills on maintaining and updating websites. Website maintenance comprises all the activities needed to ensure the operational integrity of a website or internet. In order words, it is all about doing all the things needed to make a site run smoothly and according to plan. These activities are carried out by members of a Website Maintenance Team. Owing a website or blog has its own responsibilities. One cannot just upload it and forget it. Regular maintenance is a must if one wants the site to be successful. Website is subject to being hacked. Using a proper website maintenance program can try and avoid being hacked by keeping everything up to date. These are all kinds of things that need to be done when maintaining a website. Therefore, teachers in secondary schools in Nsukka Educational Zone should have an overview or general information of website updating and maintenance to enable a quality transfer of knowledge to the students.

**Recommendations**

Based on the findings of this study, the following recommendations were made:

❖ The principals in conjunction with the government should organize workshops and seminars for

computer studies teachers to help them acquire the needed competencies on web design and development.

❖ The Ministry of Education should make the development of teachers' competencies a priority and set target when all computer studies teachers are expected to be highly ICT compliant.

❖ The government should always provide funds for procurement of computer and internet facilities and infrastructures in government secondary schools so as to curb the constraints of inadequate internet facilities and leave teachers with no excuse whatsoever for not being ICT competent.

❖ The government through the ministry of education should conduct periodic instructional supervision and review of computer facilities with a view to update the standard of computer stills acquired in secondary schools in Nsukka Educational Zone.

## Conclusion

Computer studies teachers need to improve their competencies in teaching web design and development to students. Based on the findings of this study, it was deduced that teachers are highly in need of web design and development competency skills in secondary schools in Nsukka Educational Zone. To this intent, the teachers' need to be equipped with the identified competencies in web design and development to enable them impart same on their students in order to make

a living from the skills acquired and thus help their families survive in a recessed economy.

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