

## INSTRUCTIONAL WEBSITES AND E-SECURITY SYSTEMS IN SCHOOL ADMINISTRATION

Allen, Mercy

Ph.D Student, Department of Business Education, Faculty of Education  
Ignatius Ajuru University of Education, Port-Harcourt, Rivers State, Nigeria

### ABSTRACT

*The infinite advantages of inculcating Information and Communication Technology (ICT) into education has brought about the use of instructional websites for easy access to educational materials and lectures online. And though many improvements have been made in the development of instructional websites, the issue of security and privacy have been of great concern both to open sites and restricted or private websites. This paper is on instructional websites and E-security and focuses on examining major security issues in developing and using instructional websites for schools administration. It considered the effective methods of securing instructional websites, the need for privacy practices in developing, using and accessing instructional websites, and limitations of privacy and security of instructional websites. The paper concluded that securing instructional websites is an all inclusive activity in school administration for improved overall performance.*

**Keywords: Cryptography, Integrity, Authentication, Access Control.**

### INTRODUCTION

Trends in Information and Communication Technology (ICT) has provided a lot of opportunities for the use of electronic media in education especially for personal studies, distance learning etc, where though individuals are isolated or far apart but the boredom of isolation, and solitary learning or distance is eliminated, making teaching and learning activities interesting, interactive and engaging.

According to Musa (2022) electronic learning is a recent idea and philosophy in education with the focus on serving as a platform of development for knowledge and skills wealth in the present day society. The shift from physical space teaching and learning to borderless study space engagement which was promoted because of the corona virus pandemic gave rise to higher participation of people in and prominence to on – line activities. Schools administrators started creating and introducing their academic offerings portals that ensured uninterrupted interfacing between teachers and students, administrators and their staff and students, between students and students as well as bring about a robust on – line visibility featuring rich academic operations that reduce and sometimes eliminate the drudgery created by isolation, long distance, individual learning, traditional physical classroom education delivery system while allowing flexibility in school administration and activities. Musa (2022) states that using multimedia technologies and internet in teaching and learning is a way of improving accessibility, efficiency and quality of teaching and learning by ensuring access to resources and services as well as distant exchanges and collaborations. The interface between technologies and education activities gave rise to instructional websites and a lot of people are adapting and corresponding to its use and benefits on learning.

Salawudeen (2010) opines that the new technologies gave room for more schools to embrace change with a wider reach for education. It became necessary for schools administrators to develop personal and customized websites with limited or restricted access for the general public and improved performance for its staff, students and clients.

Ayodele (2010) buttressed that the use of wireless electronics to receive and deliver information and knowledge as well as skills has been raised and practiced the world over.

Today institutions are able to use electronic technology for service delivery in education and training, monitor learners' and employee performance and report progress of learners and employees' progress through personally controlled websites. They are able to use internet facilities and other digital technologies in combination with instructional design principles to provide an electronically controlled, well designed learner centered and interactive learning environment for anyone, at anytime and in any place with restricted accessibility to only those qualified and eligible to access and use the information provided on these websites.

However, schools administrators who own and manage personalized electronic environments have been besieged with the challenges of electronic security to their websites as a result of the current rise in cybercrime, electronic identity theft information theft and online frauds. Administrators are almost overwhelmed by the constant fear of losing vital information to hackers and cybercriminals, thus this paper is aimed at examining major security issues in developing and using instructional websites in schools administration.

### **OBJECTIVE OF THE STUDY**

The main objective of the study is to examine major E – security issues in developing and using instructional websites for schools administration. Other objectives of the study includes to:

1. find out techniques for effectively securing instructional websites
2. examine the needs for privacy practices in developing, accessing and using instructional websites in schools administration
3. determine the limitations of privacy and security of instructional websites.

### **CONCEPTS OF SCHOOL ADMINISTRATION**

Administration is the process of coordinating the efforts of people and resources towards achieving expected objectives. In the school setting, administration harnesses available resources including people in order to attain educational goals whether broad or specific goals. It focuses on improving teaching and learning processes through the effective coordination of needed resources such as equipment, finance, human techniques etc.

With upsurge of Information and Communication Technology (ICT) in education, schools administrators are now encumbered with the task of ensuring, not just the development and accessibility of technology but also the security of information and the users. School administrators develop an internet reliant database that ensures seamless, borderless, limitless and timeless academic activities while also making sure that stakeholders will not encounter any losses from cyber criminals.

### **CONCEPTS OF INSTRUCTIONAL WEBSITES**

Instructional websites are non physical, non tangible and non residential web structures or facilities that are commercially zoned and utilized for the purpose of teaching and learning activities for teachers and students. It is an instructional unit of an organization or institution outside the physical office space, building or campus that focuses on specific range of and limited to instructional programs or courses through self isolated and or supplementary learning for a specified institution and its stakeholders (staff and students). Instructional websites are learning environments enhanced by the use of computer and the internet. Macmanus (2007) opines that instructional websites includes websites containing games, videos or learning materials on topics related to the resources that can act as tools to enhance learning and supplement classroom experience.

Instructional websites are powerful ways of reaching clients, students or learners as they provide in – class individualized engagement for students suffering from behaviour management issues (ie students who are easily distracted and cannot sit still for prolonged periods of time), fast, quick

and highly inquisitive and explorative learners, can easily aid assessments and reassessment by the use of test generator programs in short multiple-choice tests that are pre-saved in on-line formats in line with this Alper-leroux (2010) stated that unrestricted access and freedom on the internet can be dangerous especially for young students therefore instructional websites contents should be reliable, align to what is being taught in the physical classroom, within the academic level of the students and be appropriate to the age of the students. Instructional websites are not expected to have adult contents, advertisements or links.

Instructional websites have the capacity to save preparation time over the long run when the curriculum element content posted is rich in subject matter. Instructional websites are facilitated by the interaction between electronic devices and internet that a teacher employs to implement instruction and facilitate learners' achievement of learning outcomes. Instructional websites are also a group of World Wide Web (www) pages that contains hyperlinks to each other and can be made available and accessible online either to everyone for unrestricted access website or to a specific educational institution and its staff and students for restricted access websites. It is an educational online site where persons that are qualified to access it can navigate virtually and collate needed information.

Instructional websites have the capacity to improve learning appeal of students and reduces learning to fun. It ensures information provided to students are accurate as they are edited by professionals leaving little or no room for errors making these learning sources very reliable.

Tanggoro (2015) opines that instructional websites facilitates learning and increases understanding by attracting attention, developing interest of learners, adjusting the learning climate and promoting acceptance of an idea.

Instructional websites enables teachers promote enquiring minds on students that instills in them a lifelong love for studying in their areas of specialization and subjects of interests. Instructional websites creates first positive impression on students that aids the capturing of attention and increases curiosity as well as provides positive user experience.

### **TYPES OF INSTRUCTIONAL WEBSITES**

There is an endless array of instructional websites which are either dynamic or straightforward with endless subjects or topics to choose from, some of these instructional websites includes the following:

1. **Electronic Learning Portals**

These are websites or applications that ensure better knowledge on specific subject matters and aids mastery in skills and concepts in such subjects. e.g edublogs.

2. **Digital Content Serving Sites**

These are also known as digital media and can be stored on analog or digital storage as digital data and transmitted digitally as files and through streaming. Examples are those used by digital content creators.

3. **Schools Educational Video Websites**

These are owned by schools and can contain games videos and other resources that are related to subjects that can enhance teaching and learning just like in the classroom e.g zoom classes by most schools during the covid – 19 pandemic.

4. **Language Learning Websites**

These offer language learning courses with a lot of educational tools and professionals aids learning at almost any level (ie preliminary, professional or specialized courses).

5. **Online Courseware**

These are E – learning tools or software that replicates real modern classroom but simplifies concepts and principles applied in teaching a subject for improved comprehension by students. e.g U – lesson learning App.

### 6. **Tertiary Educational Websites**

These are websites owned by specific higher institutions especially for the administration of their institution and easy interaction between management, staff and students and where the public can have a peek at what they do within their domain.

### 7. **Learning Management Systems**

These are softwares designed to create, distribute, manage and store educational materials and its delivery. It can be privately owned or open source platform and it is designed to provide e – learning solutions.

Other instructional websites for training and to boost skills acquisition includes Udemy, Alison, Academic Earth, Codecademy, Coursera, Udacity, Skillshare etc.

### **BENEFITS OF INSTRUCTIONAL WEBSITES TO SCHOOL ADMINISTRATION**

Instructional websites are designed in a way that enables learning to be entertaining, interesting and engaging for students especially with the rise in the use of social media by the younger generation who can be easily attracted to uploads and updates from an institutions website while using the devices rather than other forms of notification. Also well designed websites can take care of such difficulties as increased running costs and the pressure of controlling cost and optimizing efficiency and significant cost saving.

An instructional website can improve services, provide more functions simultaneously, releases information faster, have wide availability, visibility and accessibility of information coverage.

### **Other benefits of instructional websites in a schools administration includes**

1. Easy interaction with its students.
2. It can keep in touch and interact easily with parents.
3. Students enjoy better learning experiences.
4. It is always able to serve fresh content updates for teaching material online.
5. It is able to broadcast information and updates without interruption.
6. It has the ability to attract more students.
7. Keeps tabs on students' life and activities in the school .vicinity.
8. Seamless updates of the functionality of campus amenities.
9. Connectivity and networking of alumni community.
10. It ensures lower investment in learning and reduced time of training.
11. Less paper work and less carbon dioxide emissions on the environment (environment friendly).
12. It is able to put together and in focus the core values of the institution.
13. It increases learning convenience.
14. It allows students to access updated content whenever needed and keeps them in turn with other learner at their level from other institutions.
15. It enables students to personalize learning contents.
16. It creates and communicates new learning and administrative training policies, concepts and ideas.
17. Teachers achieve higher levels of coverage and consistency with their audience.
18. It encourages and promotes floating teachers (ie teachers who move from one e – classroom to the other or one school to the other and who provide materials supplied by electronic devices and are able to keep in touch with students, colleagues and even the school authority when need be.

### **TRENDS IN INSTRUCTIONAL WEBSITES**

1. Easy access of courseware using an array of different computing devices and from various locations through different networks by learners.
2. Instructional websites are adopting open standards.
3. Instructional websites are more user – friendly with dynamic course wares based on learners needs.
4. Instructional Applications are more intelligent with the use of artificial intelligence (AI) and adaptive.
5. Knowledge management (task specific training for improved employee efficiency is standardized) and is now common application in the digital economy.

#### **INSTRUCTIONAL WEBSITE SECURITY**

This is the electronic security that is applied to instructional portals and learning materials that comprises study notes, demonstrations and references etc that makes up one or more courses in education. The goal of instructional security is to enable instructional websites users to maintain certain level of personal space where they are able to control the conditions and terms under which personal information is shared with others.

#### **NEED FOR SECURED INSTRUCTIONAL WEBSITES**

Security is very important in the actual development, access and use of instruction websites and to avoid security breaches and theft certain important elements are to be considered and these includes:

1. **Confidentiality and Privacy**

This refers to limiting the access and disclosure of information to only authorized users and preventing access by or disclosing information to unauthorized persons. One of the reasons for securing instructional websites in school administration is to ensure that the actual information can be accessed by only the authorized users. Users reserve the right to keep their information private which can be made possible by the type and quality of authentication used or approved by the institution or web developers.

2. **Integrity**

This is the trustworthiness of an information resource. It ascertains that information emanated from the indicated source. It means data cannot be modified without authorization and is preserved without corruption of whatever was transmitted or entered into the system.

3. **Non Repudiation**

This ensures that those who are originators of a message or information cannot deny it.

Wikipedia (2022) states that cryptography ensures that non repudiation service provides proof of the integrity, origin of information and an authentication with high assurance that can be taken to be genuine.

4. **E – Assessment**

To ensure a controlled environment that all assessment candidates have equal opportunities to take an assessment without prejudice to any candidate.

5. **Network Security**

To combat eavesdropping, control access from firewalls, unverified networks and to detect intrusions.

#### **BENEFITS OF SECURED INSTRUCTIONAL WEBSITES TO SCHOOL ADMINISTRATION**

Instructional websites when properly secured

- Can protect the materials of authors from copyright infringements.
- Can protect teachers' evaluation systems from students who would want to undermine it by cheating.
- It protects students from teachers who closely monitor the use of the instructional materials or the teachers' evaluation systems.

- It ensures that authentication and authorization as well as proof of origin of uploaded materials are secured.
- It ensures standardized E – assessment.

### **INSTRUCTIONAL WEBSITES THREATS**

Web threats or cyber security threats are any possible malicious attacks that wants to illegally access, disrupt digital operations or even damage information. Threats can emanate from hackers, terrorist groups, mischievous/ fraudulent students, lone hackers or criminals and dissatisfied employees. It can result in exposing sensitive school information such as e- assessments questions, student’s results and other private data, exploitation of copyrights of lecturers etc.

### **TYPES OF INSTRUCTIONAL WEBSITE SECURITY THREATS**

The types of security threats are endless and their development is synonymous with developments and applications of technology in human endeavors. However, some security threats that affects instructional websites includes:

#### **MALWARE**

These are malicious software, viruses, ransom ware or worms that can be activated when a user ignorantly clicks on a malicious attachment or link that will lead to downloading or installing a dangerous software. Once activated, it can:

- Block the access to key network components
- Will install other harmful softwares
- Dubiously obtain information directly from the hard drive
- Deactivate or disrupt operation of the entire system.

#### **EMOTET**

Is an advanced Trojan that affects financial operations uploads other Trojans during e-transactions especially in bank settings. It is a very expensive and destructive malware.

#### **DENIAL OF SERVICE**

A denial of service (DOS) is a cyber attack where cyber criminals can flood a computerized device or network to such an extent that it cannot respond to valued requests or requires from authorized users and use such periods of unresponsiveness from devices and networks to launch. There is also distributed denial of access (DDOS) that attacks computers and disrupts network operation in a geographical location.

#### **PHISHING**

Phishing attackers use fake communication, like an e – mail to truck the receiver into opening it and carrying out the outlined instructions such as providing sensitive data on credit cards, ATM pin numbers, serial numbers etc that will enable and login data that can enable login and execution of their devious acts.

#### **PASSWORD ATTACKS**

A cybercriminal can access a whole lots of information if he has access to the right password. Password attacks can be either accessing a password fraudulently, guessing or by social engineering (a password attack where the attacker relies on human interaction by tricking them into breaking standard security practices).

#### **MAN – IN – THE – MIDDLE**

Is an attack that occurs when the hackers intercept a transaction or enters between the two parties involved in a transactions as a third party or middle man of the transaction or out rightly interrupts flow of transaction, filter and steal data e.g illegal/or unauthorized use of data.

## **TECHNIQUES IN SECURING INSTRUCTIONAL WEBSITES**

### **1. Cryptography**

Cryptography is a mathematical method of securing instructional websites. According to Al – Hamdani (2010) cryptography is secret – writing and the study of mathematical techniques functions that transfers plaintexts (P+) into ciphertext (C+). ie encryption. Crypto system can either be unkeyed (not requiring key for encryption and decryption) or keyed (requires key for encryption and decryption). Cryptography ensures confidentiality, privacy, data integrity, authentication and non – repudiation. This method combines general public keys with individuals user identifies by means of certificate authority (CA) which is usually unique to the certified individual user.

### **2. Data Integrity**

This is a mechanism that ensures that data is not altered or modified when transmitted from source to destination when it is stored without authorization through the use of crypto hash.

### **3. Authentication**

This is the act or process of establishing or confirming something or someone as real, true or correct. It involves confirming the identity or origin of a fact and assuring that a computer program, file or source can be trusted. Authentication methods are varied and includes passwords, challenge response protocol (e.g I’m not a robot), secure token authentication (e.g bank token), biometric authentication (e.g eyeball, facial and finger print authentication) and smart card authentication (e.g ATM card chips).

Authentication ensures that only credible and verified persons will be able to access and use the websites, web pages or portals. The cheapest of the authentication protocols is the password. The most expensive and more secure authentication protocol is the biometric system although it is also more cumbersome but with better integrity especially for an institution’s use.

### **4. Access Control**

This ensures that users access only those resources and services that they are entitled to access and that qualified users are not denied access to services they are rightly expected to receive. The elements that are involved in access control includes identification, authentication, authorization, decision and enforcement.

## **CHALLENGES IN SECURING INSTRUCTIONAL WEBSITES IN SCHOOLS**

### **ADMINISTRATION**

1. Authentication may not be secure enough for instructional websites users information safety unless it is combined with other external secure systems.
2. Designing access control for instructional websites may be complicated because of the dynamic nature of schools administration and the array of tasks performed.
3. Non repudiation safeguard mechanisms such as data hash originality, integrity and genuity of data and source of information but it is still possible for information to be tampered with in transit either through phishing or middlemen attacks.

## **CONNECTIVISM THEORY OF LEARNING – GEORGE SIEMENS**

The connectivism theory is based on the work of Siemens (2004) who saw learning as more than an internal and individual process. Connectivism is a theoretical framework that aids understanding learning in a digital age.

The theory posits that learning takes place when learners make connections between ideas located throughout the personal learning networks (ie database, social media, internet, learning

management systems or even other people), connecting the right people and right resources can enhance the learning process for all stakeholders within the learning network. It further posits that technology increases learners' access to information and their ability to be a part of a greater learning community.

Some of the premises of this theory include:

1. Learners need to distinguish important and valid from unimportant and invalid information because the flow of information is continuous and dynamic.
2. It encourages collaborative creation of knowledge.
3. It advocates spontaneous learning groups for broader knowledge base.
4. It encourages self – directed learning and sharing of learning resources.
5. Learning can reside in non human appliances.

Summarily, connectivism emphasizes how internet technologies contribute to new avenues of learning experiences.

### **CONCLUSION**

The paper described instructional websites, the types of instructional websites, benefits etc. It considered the need for securing instructional websites, types of website threats, some techniques and benefits of securing instructional websites in school administration etc. Conclusively securing an instructional websites in administration of school should be all inclusive but should not negatively affect the overall performance of the institution's activities.

### **SUGGESTIONS**

The following suggestions were put forward by the paper:

1. School administrators should properly consider the types and volume of activities that are to be carried out in an instructional website before choosing the security technique.
2. Users of instructional websites that have restricted access need to have authentication passwords that are not easy to discern, guess or break.
3. School administrators and instructional website users should ensure not to disclose or display any information that aid cybercriminals and unauthorized users access.
4. School administrators and instructional website gatekeepers should adopt diversified, robust and multivariate forms of validating users' access to their websites.

### **REFERENCES**

- Al – Hamdani, W. (2010). Cryptography – based access control in health care web systems.
- Alper – Leroux, C. (2010). Using instructional websites to differentiate. Retrieved from <https://www.techlearning.com> on 13<sup>th</sup> August, 2022 at 4:47pm.
- Dakota, U. (2022). What is a cyber security threat. Retrieved from <https://university of North Carolina> on 14<sup>th</sup> August, 2022 at 6:09pm.
- Debell, A. (2022). What is the ADDIE model of instructional design retrieved from <https://waterbearlearning.com> on 13<sup>th</sup> August, 2022 at 7:41pm.
- EI – Khahb, K.; Korba, L.; Xu, Y. & Yee, G. (2007). Privacy and security in E – learning. Retrieved from <https://www.researchgate.net> on 13<sup>th</sup> August, 2022 at 5:57pm. Doi: 10.4018/a7815a9049373.ch023.
- Kalish, A. (2022). Best sites for free online courses to boost your skills: Training and development manual. Retrieved from <https://www.themuse.com> on set 13<sup>th</sup> August, 2022 at 6:51pm.

Macmanus, R. (2007). E – learning 2.0: All you need to know. Retrieved from <https://www.readwriteweb.com/archives/e-learning-20-all-you-need-to-know-php>.

Musa, B.A. (2022). Importance of E – learning in Nigeria retrieved from <https://www.academic.edu> on 13<sup>th</sup> August, 2022 at 6:49pm.

Okah, I.R. (2014). Educational management in Nigeria. A functional approach Harey Publication Coy, Port Harcourt.

Oyazun, B. & Conklin, S. (2020). Learning theories. EdtechBooks retrieved from [https://edtechbooks.org/id/learnng\\_theories](https://edtechbooks.org/id/learnng_theories) on the 15<sup>th</sup> August, 2022 at 4:38pm.

Sahin, M. (2022). Importance of an educational websites post pandemic. Retrieved from <https://www.perceptionssystem.com>. Retrieved on 13<sup>th</sup> August, 2022 at 3:34pm.

Tanggoro, U. (2015). The use of instructional media to improve student motivation in learning Dialektika Journal Vol 3 No 1, March – August 2015 pp 104 Retrieved on 20<sup>th</sup> August, 2019 at 5:32pm.

Teachmint (2022). Educational sites. Retrieved from <https://www.teachmint.com> on 13<sup>th</sup> August, 2022 at 5:09pm.